

**ENERGY EFFICIENCY LEGISLATION**

---

---

**HEARING**  
BEFORE THE  
**COMMITTEE ON**  
**ENERGY AND NATURAL RESOURCES**  
**UNITED STATES SENATE**  
ONE HUNDRED FOURTEENTH CONGRESS  
FIRST SESSION  
ON  
**ENERGY EFFICIENCY LEGISLATION**

APRIL 30, 2015



Printed for the use of the  
Committee on Energy and Natural Resources

**ENERGY EFFICIENCY LEGISLATION**

**ENERGY EFFICIENCY LEGISLATION**

---

---

**HEARING**  
BEFORE THE  
**COMMITTEE ON**  
**ENERGY AND NATURAL RESOURCES**  
**UNITED STATES SENATE**  
ONE HUNDRED FOURTEENTH CONGRESS  
FIRST SESSION  
ON  
**ENERGY EFFICIENCY LEGISLATION**

APRIL 30, 2015



Printed for the use of the  
Committee on Energy and Natural Resources

---

U.S. GOVERNMENT PUBLISHING OFFICE

95-273

WASHINGTON : 2016

---

For sale by the Superintendent of Documents, U.S. Government Publishing Office  
Internet: bookstore.gpo.gov Phone: toll free (866) 512-1800; DC area (202) 512-1800  
Fax: (202) 512-2104 Mail: Stop IDCC, Washington, DC 20402-0001

COMMITTEE ON ENERGY AND NATURAL RESOURCES

LISA MURKOWSKI, Alaska, *Chairman*

JOHN BARRASSO, Wyoming	MARIA CANTWELL, Washington
JAMES E. RISCH, Idaho	RON WYDEN, Oregon
MIKE LEE, Utah	BERNARD SANDERS, Vermont
JEFF FLAKE, Arizona	DEBBIE STABENOW, Michigan
STEVE DAINES, Montana	AL FRANKEN, Minnesota
BILL CASSIDY, Louisiana	JOE MANCHIN III, West Virginia
CORY GARDNER, Colorado	MARTIN HEINRICH, New Mexico
ROB PORTMAN, Ohio	MAZIE K. HIRONO, Hawaii
JOHN HOEVEN, North Dakota	ANGUS S. KING, JR., Maine
LAMAR ALEXANDER, Tennessee	ELIZABETH WARREN, Massachusetts
SHELLEY MOORE CAPITO, West Virginia	

KAREN K. BILLUPS, *Staff Director*

PATRICK J. MCCORMICK III, *Chief Counsel*

CATHERINE CAHILL, *Congressional Fellow*

ANGELA BECKER-DIPPMANN, *Democratic Staff Director*

SAM E. FOWLER, *Democratic Chief Counsel*

ALLEN STAYMAN, *Democratic Professional Staff Member*

# CONTENTS

## OPENING STATEMENTS

	Page
Murkowski, Hon. Lisa, Chairman, and a U.S. Senator from Alaska .....	1
Cantwell, Hon. Maria, Ranking Member, and a U.S. Senator from Washington .....	2
Portman, Hon. Rob, a U.S. Senator from Ohio .....	11
Hoeven, Hon. John, a U.S. Senator from North Dakota .....	16
Gardner, Hon. Cory, a U.S. Senator from Colorado .....	17
Stabenow, Hon. Debbie, a U.S. Senator from Michigan .....	17

## WITNESSES

Collins, Hon. Susan M., a U.S. Senator from Maine .....	5
Coons, Hon. Christopher A., a U.S. Senator from Delaware .....	7
Shaheen, Hon. Jeanne, a U.S. Senator from New Hampshire .....	9
Schatz, Hon. Brian, a U.S. Senator from Hawaii .....	12
Klobuchar, Hon. Amy, a U.S. Senator from Minnesota .....	14
Hogan, Dr. Kathleen B., Deputy Assistant Secretary for Energy Efficiency, Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy .....	18
Crasi, Tony, on behalf of the National Association of Home Builders and Owner and Founder, The Crasi Company, Inc. ....	34
Gayer, Dr. Ted, Vice President and Director of Economic Studies, Joseph A. Pechman Senior Fellow, The Brookings Institution .....	73
Nadel, Steven, Executive Director, American Council for an Energy-Efficient Economy .....	77
Therriault, Hon. Gene, Vice-Chairman, National Association of State Energy Officials, and Deputy Director, Energy Policy and Outreach, Alaska Energy Authority .....	94

## ALPHABETICAL LISTING AND APPENDIX MATERIAL SUBMITTED

Alaska Native Tribal Health Consortium: Letter for the Record .....	156
Alexander, Hon. Lamar: Statement for the Record .....	242
Alliance to Save Energy & the American Council for an Energy-Efficient Economy: Letter for the Record .....	243
American Chemistry Council: Statement for the Record .....	245
American Gas Association regarding S. 1029 and S. 869: Statement for the Record .....	247
American Gas Association, et al., regarding S. 1029: Letter for the Record .....	252
American Gas Association, et al., regarding S. 869: Letter for the Record .....	254
American Institute of Architects: Letter for the Record .....	256
American Public Gas Association: Statement for the Record .....	263
ASHRAE: Statement for the Record .....	271
Association of Art Museum Directors: Letter for the Record .....	280

IV

	Page
Association of Home Appliance Manufacturers:	
Statement for the Record .....	281
Big Ass Solutions:	
Letter for the Record .....	285
Bristol Bay Native Corporation and CCI Group, LLC:	
Letter for the Record .....	287
Business Council for Sustainable Energy:	
Statement for the Record .....	290
Callahan, Kateri, President, The Alliance to Save Energy:	
Statement for the Record .....	295
Cantwell, Hon. Maria	
Opening Statement .....	2
CenterPoint Energy:	
Letter for the Record .....	301
Chamber of Commerce of the United States of America:	
Letter for the Record .....	304
Coca-Cola Company:	
Statement for the Record .....	305
Collins, Hon. Susan M.:	
Opening Statement .....	5
Consumer Federation of America and National Consumer Law Center:	
Letter for the Record .....	308
Consumers Union:	
Letter for the Record .....	310
Coons, Hon. Christopher A.:	
Opening Statement .....	7
Crasi, Tony:	
Opening Statement .....	34
Written Testimony .....	36
Responses to Questions for the Record .....	142
DNV-GI:	
Statement for the Record .....	313
Efficiency First and Home Performance Coalition:	
Statement for the Record .....	321
Energy Efficiency Business Group:	
Letter for the Record .....	326
Enterprise Community Partners, et al.:	
Letter for the Record .....	329
Environmental Defense Fund:	
Statement for the Record .....	331
Federal Performance Contracting Coalition:	
Statement for the Record .....	333
Gardner, Hon. Cory:	
Opening Statement .....	17
Gayer, Dr. Ted:	
Opening Statement .....	73
Written Testimony .....	75
Responses to Questions for the Record .....	146
Geothermal Exchange Organization:	
Statement for the Record .....	341
GoodCents Holdings, Inc.:	
Statement for the Record .....	342
Habitat for Humanity:	
Statement for the Record .....	348
Hoeven, Hon. John:	
Opening Statement .....	16
Hogan, Dr. Kathleen B.:	
Opening Statement .....	18
Written Testimony .....	21
Responses to Questions for the Record .....	128
Information Technology Industry Council:	
Statement for the Record .....	352
Institute for Market Transformation:	
Letter for the Record .....	356
Insulation Contractors Association of America:	
Statement for the Record .....	359

	Page
Jewish Federation of North America:	
Letter for the Record .....	360
Klobuchar, Hon. Amy:	
Opening Statement .....	14
Leading Builders of America:	
Statement for the Record .....	361
Markey, Hon. Edward J.:	
Statement for the Record .....	365
Murkowski, Hon. Lisa:	
Opening Statement .....	1
Nadel, Steven:	
Opening Statement .....	77
Written Testimony .....	79
Responses to Questions for the Record .....	148
NAIOP (Commercial Real Estate Development Association):	
Letter for the Record .....	366
NAIOP (Commercial Real Estate Development Association) regarding S. 1052:	
Letter for the Record .....	367
National Association of Energy Service Companies:	
Letter for the Record .....	369
National Association of Manufacturers:	
Letter for the Record .....	372
National Association of Realtors:	
Letter for the Record .....	374
National Electrical Manufacturers Association:	
Letter for the Record .....	375
National Ground Water Association:	
Statement for the Record .....	382
National Housing Trust:	
Letter for the Record .....	383
National Insulation Association:	
Statement for the Record .....	386
National Propane Gas Association:	
Letter for the Record .....	390
NiSource, Inc.:	
Statement for the Record .....	393
Portland Cement Association:	
Memorandum for the Record .....	396
Portman, Hon. Rob:	
Opening Statement .....	11
Public Citizen:	
Statement for the Record .....	398
Puget Sound Energy:	
Letter for the Record .....	400
Real Estate and Construction Industry:	
Statement for the Record .....	402
Retail Industry Leaders Association:	
Letter for the Record .....	407
Sanders, Hon. Bernard:	
Statement for the Record .....	408
SAVE Act Coalition:	
Letter for the Record .....	412
Schatz, Hon. Brian:	
Opening Statement .....	12
Shaheen, Hon. Jeanne:	
Opening Statement .....	9
Stabenow, Hon. Debbie:	
Opening Statement .....	17
Therriault, Hon. Gene:	
Opening Statement .....	94
Written Testimony .....	96
Responses to Questions for the Record .....	150
Union of Orthodox Jewish Congregations of America:	
Statement for the Record .....	415
United States Conference of Mayors:	
Statement for the Record .....	419

	Page
Vermont Energy Investment Corporation:	
Statement for the Record .....	436
Vermont Public Service Department:	
Letter for the Record .....	439

---

The text for each of the bills which were addressed in this hearing can be found on the committee's website at: <http://www.energy.senate.gov/public/index.cfm/hearings-and-business-meetings?ID=a7ea3045-7029-4e1e-abeb-edf57628ab47>.

## ENERGY EFFICIENCY LEGISLATION

---

THURSDAY, APRIL 30, 2015

U.S. SENATE,  
COMMITTEE ON ENERGY AND NATURAL RESOURCES,  
*Washington, DC.*

The Committee met, pursuant to notice, at 10:04 a.m. in room SD-366, Dirksen Senate Office Building, Hon. Lisa Murkowski, Chairman of the Committee, presiding.

### OPENING STATEMENT OF HON. LISA MURKOWSKI, U.S. SENATOR FROM ALASKA

The CHAIRMAN. Good morning. We will call to order the Energy Committee this morning. We are here today to consider a whole host of bills pertaining to energy efficiency. We will have two panels this morning before the Committee.

One, a panel of Senators who wish to speak about their legislation, and one of subject matter experts who can speak both to the bills that we are considering today and the broader topic of energy efficiency overall.

So thank you all for coming and helping us understand the impact of the various bills that we have before us.

This hearing is also an important next step in the development of the Energy Committee's very broad-based energy bill. This is the first of four legislative hearings that we will hold in the next month. There will be one hearing for each title we will be considering.

We had a success last week with the Energy Efficiency Improvement Act. It was good to see that that has now moved forward through the process, and unanimous passage of that legislation, I think, indicates the level of support for energy efficiency. It also indicates the Senate is really capable of coming together to pass efficiency legislation that saves both energy and money. It is good for the consumers. It is good for all.

This issue, the issue of energy efficiency, I think, is a good, bipartisan place to start our discussions when we are talking about Federal energy policy. We have 22 bills before us today. I think that is some measure of the interest that we have in this. Some of the measures are very well vetted. We have seen them before. We have Senator Portman and Senator Shaheen's Energy Savings and Industrial Competitiveness Act. We have some new ones such as the Smart Building Acceleration Act and some like the PREPARE Act which encourages collaboration across many levels of government and stakeholders. Others are targeted towards a more specific need. For example, the ceiling fan fix. How much more specific

could we be than ceiling fans? Several reauthorize established programs and several others require new standards and programs. Some are voluntary in nature while some are mandatory. Still others seek to make the Federal Government more effective in financing and implementing efficiency projects.

Taken as a whole the bills before us cover a wide variety of efficiency ideas. They offer the potential to reduce energy usage and costs across our country and throughout our economy. They put forward methods to enhance our leadership on efficiency technologies and to develop a cadre of professionals to work within the field. They also seek to protect consumers, manufacturers and the environment from unintended consequences of new or revised standards.

I am pleased that we have witnesses here who can speak to these many bills as well as the impacts they will have on the government, not only the Federal Government, but our state governments, consumers, the economy and front line project implementers.

It should be an interesting, pretty far-ranging discussion this morning, but I think it is, again, important that we consider how we can work to build an energy efficiency title that works for all.

In the interest of efficiency and in light of the measures that we are going to be considering this morning, I will conclude my comments and turn to the Ranking Member for her comments this morning. Welcome to our fellow colleagues who have taken time out of their very busy mornings to come before the Committee, and we look forward to your comments as well.

Senator Cantwell.

**STATEMENT OF HON. MARIA CANTWELL, U.S. SENATOR FROM WASHINGTON**

Senator CANTWELL. Thank you, Madam Chair, and thank you for holding this first of several legislative hearings on a process to move us forward on energy policy. Hopefully we will be building a record here for important steps in crafting legislation that we can successfully move through both the House and the Senate.

I also want to thank our witnesses today. We are going to hear from several of our colleagues, and I certainly appreciate Senators Collins and Coons being here and for their leadership on a variety of issues related to energy efficiency and continued focus in this area.

I know our colleague, Senator Klobuchar, is joining us as well. Yesterday she shared a round table discussion with many energy efficiency leaders, so we thank her for that as well.

Today we are here to discuss energy efficiency which is, in some ways, the most obvious of energy sources. Why is that? Well, it is pretty simple. It is just the math. It is compelling economics. Energy efficiency costs less than half of what it costs for new energy production. The Lawrence Berkeley National Laboratory has estimated the cost of energy efficiency is 4.5 cents per kilowatt compared to 12 cents per kilowatt for new production.

In short, energy efficiency as a resource is larger, cheaper, a better job creator and carries lower environmental impacts than the alternatives. Not only does it save consumers, but it strengthens

the economy, builds flexibility in our grid and reduces carbon pollution.

Let me say just a few words about the economic benefits. From 2007 to 2014 national energy use fell 2.4 percent while GDP grew eight percent. In other words, we experienced an energy productivity increase of 11 percent in eight years. That means for every electron or molecule of energy consumed in the U.S., we are getting more and more economic production.

A handful of programs at the U.S. Department of Energy or DOE are important contributors to this dynamic. DOE's Building Code program, for example, will help put more than \$7.4 billion back into consumers' pockets in 2020 and up to \$230 billion by 2040. This program's original cost was about \$100 million from 1992 to 2012. So, basically that is a ratio of \$400 in savings for every dollar spent. I think that is a pretty impressive ROI.

Similarly the Appliance and Equipment Standard programs cost the nation \$40 million annually and on average has reduced our nation's electricity consumption by seven percent below what it would otherwise have been. In a typical household, energy costs are about \$500 a year less than they would have been if there had not been this National Appliance Efficiency Standard Program.

So when we discuss these initiatives I think it is important for my colleagues to remember that it is often the case that successful Federal programs have been built on the hard work and leadership of a number of states. The drive towards energy efficiency, at the time policy makers called it conservation, really began with efforts on the West Coast.

California's energy efficiency efforts have helped the state avoid the need for at least 30 power plants, saved consumers \$65 billion and eliminated carbon pollution equivalent to 5,000,000 cars off the road.

The Northwest Power Planning Act, which originated in this Committee, was enacted in 1980 and made conservation the resource of first resort in our regional power plans and even gave rise to some of the nation's first models of conservation code efforts.

Today, some 24 states have laws on their books on energy efficiency resource standards—binding saving targets for utilities or similar activities. Once again, I think it is fair to say that the resources that cost consumers less, make our economy more competitive and reduce environmental impacts are always a good thing for our nation.

So the question before us today is what more can be done to drive energy efficiency into our economy?

The U.S. economy in the advent of the distributed generation, dozens of opportunities exist across residential, commercial, industrial and agriculture and government sectors. I think we should consider a number of approaches to fully leverage these opportunities.

First, we need the right framework and incentives for utilities to fully embrace the least cost resource. Senator Franken's legislation that we are going to hear about today, the Federal Energy Efficiency Resource Standard, is one method to drive this outcome. So I look forward to that topic today.

In my state, Seattle City Light used a variety of efficiency measures to reduce its load annually by 1.3 megawatts per year which is the equivalent of a 150 megawatt power plant. So we need to create similar conditions.

Second, we need a robust Federal commitment to research and development of new technologies that will continue to lead the way on energy. Technology innovation is one of the key ways to create continuous cycles of efficiency, and one example of this is the opportunity of R and D on high performance buildings.

We have major employers that are aggregating and analyzing business data on their corporate campuses in order to learn where costs can be cut and to help achieve a carbon reduction goal. I have introduced legislation to help accelerate this transition to smart buildings by supporting research on data, on software, and on communication systems.

We also cannot forget the opportunities of efficiency in the transmission and distribution grid. On Tuesday Secretary Moniz was here to discuss on the Quadrennial Energy Review, and he outlined several recommendations to create more flexibility, more resilience and increase energy efficiency.

Third, we must be committed to the network partnership between Federal, state and local institutions. Manufacturers, utilities, consumers and stakeholders, they all play a role in this. The issue is that we have to have Federal leadership with respect to things like the appliance standards and continue to lessen regulatory burdens and be a platform for demonstration. Most people will tell you that the demonstrations we show then enable the private sector to implement them across many different businesses.

There is a lot to be done in driving these outcomes, but I look forward to working with Chairwoman Murkowski and members of this Committee, who all have great ideas on putting a good energy efficiency title in an energy bill.

Thank you.

The CHAIRMAN. Thank you, Senator Cantwell.

Let's start with our good ideas.

We will hear from our colleagues who have taken time from their busy morning to come before the Committee to present some of the areas where they feel we can make some headway when it comes to efficiencies whether it is within our schools, through weatherization programs or the approach that Senators Portman and Shaheen have brought to the table, clearly leading on this area, a critically important area of energy efficiency throughout our economies.

We will start this morning with you, Senator Collins, as you speak to your legislation about retrofitting our schools and the energy savings that we can find there. This was something that we considered during the budget process, and I think you enjoyed good, strong, bipartisan support.

I believe Senator Coons was a co-sponsor of that as were many of us, so thank you for your leadership and if you would like to lead off this morning? Welcome.

**STATEMENT OF HON. SUSAN M. COLLINS, U.S. SENATOR FROM  
MAINE**

Senator COLLINS. Thank you very much, Madam Chairman, Ranking Member Cantwell, members of this distinguished Committee.

First let me commend you for holding this hearing this morning to examine so many legislative proposals having to do with the energy efficiency. I have always thought of energy efficiency as being the low hanging fruit when it comes to reducing energy costs and having other benefits such as both the Chairman and the Ranking Member outlined in your opening remarks. Encouraging the adoption of energy efficiency measures is one of the easiest, yet most effective mechanisms for reducing energy consumption, lessening pollution and ultimately saving families, businesses, communities and governments at all levels, money.

I appreciate the opportunity to speak about a bill that I have sponsored, along with the distinguished Senator from Virginia, Senator Warner, to streamline the available Federal energy efficiency programs and financing to improve efficiency and lower energy costs for our nation's schools.

Before I describe our bill, Senate bill 523, in greater detail, I would like to very briefly note my strong support for two other bills that are on your agenda both of which I have co-sponsored and both of which happen to have the chief sponsors here today which was not planned in advance.

The first is the Energy Savings and Industrial Competitiveness Act which is sponsored by Senators Portman and Shaheen which proposes cost effective mechanisms to support the adoption of off the shelf technology for buildings, manufacturers and the Federal Government.

The second is the Weatherization Enhancement in Local Energy Efficiency Investment and Accountability Act sponsored by Senator Coons which would reauthorize and enhance two successful and long standing Federal energy programs, the Weatherization Assistance Program and the State Energy Program.

I am proud to be a co-sponsor of both of these important initiatives.

With regard to energy efficiency in schools there are a number of Federal initiatives already available to schools to help them become more efficient, but in many cases schools are not taking advantage of these programs. So I set out to find out why.

Well, the answer is that we need to do a better job of helping school officials learn more easily about what Federal programs and incentives are available to improve energy efficiency and lower costs. By providing a streamlined coordinating structured led by the Department of Energy our bill would help schools navigate the available Federal programs and financing without authorizing new programs or funding. Decisions about how best to meet the energy needs of their schools would appropriately remain in the hands of states, school boards and local officials.

Specifically our bill establishes the Department of Energy as the lead agency for coordinating and disseminating information on these programs. That is going to make a big difference, particularly to rural schools that do not have the grant writers, the staff, to go

and survey the entire Federal Government until they stumble upon one of these programs.

Our bill would require DOE to review the existing Federal programs which are scattered at the Departments of Agriculture, Energy, Education, Treasury, the IRS, EPA. No wonder schools are having difficulty in finding how whether these programs exist and how to access them.

It would also streamline communication and outreach to the states, local education agencies and schools to help them facilitate partnerships to support the initiation of these projects.

The Department would also provide technical assistance to help schools navigate project financing and development to better ensure their successful applications.

Assisting our nation's schools, many of which are very old and in need of energy efficiency upgrades, in tapping into existing Federal programs to lower energy usage and save money is just common sense.

Finally let me note, I see this as the first step. As we have this coordinating structure we may well decide that some of these programs should be moved to a central agency. GAO has done a little bit of work on this, but I believe by establishing this coordinating mechanism that it will enable us to do a better job of helping schools access these programs. Thank you very much.

The CHAIRMAN. Thank you, Senator Collins.

Senator KING. Madam Chair?

The CHAIRMAN. Senator King.

Senator KING. Unfortunately I have to return to a hearing on the Ukraine in the Armed Services Committee, but I wanted to commend to the Committee the principle that I followed since arriving here which is do what she says. [Laughter.]

Senator COLLINS. Thank you, my thanks to the Senator from Maine.

The CHAIRMAN. Wise words from the Junior Senator from Maine. We appreciate that, and we appreciate all of your interest in these issues, Senator King, and your involvement in the Committee.

Senator Collins, thank you for not only being persistent in this area, but also reminding us that we do have considerable programs scattered throughout our agencies that are there to help, but so much of it is knowing how to access.

I think Senator Coons, you know, very keenly, that when we are talking about the issue of weatherization, we have weatherization programs scattered all throughout. How we can better collate them so that we can access them and be more efficient than with what has already been established is key. So, we appreciate your leadership in this area and look forward to your comments on Senate bill 703.

Senator Collins, I am sure you have places to go, so if you want to excuse yourself we appreciate you coming by the Committee this morning.

Senator Coons.

**STATEMENT OF HON. CHRISTOPHER A. COONS, U.S. SENATOR  
FROM DELAWARE**

Senator COONS. Thank you, Chairman Murkowski and Ranking Member Cantwell for the opportunity to testify, and thank you for holding this hearing on a broad menu of legislation that focuses on utilizing energy efficiency to help households, businesses and taxpayers to save money on their energy needs. I am pleased to be in the company of two such experienced and effective and engaged advocates for energy efficiency as Senators Shaheen and Senator Collins.

It is, after all, an area that can unite Democrats and Republicans. Encouraging the use of energy efficiency policies is just common sense. It saves money, enhances our national security, spurs innovation, creates jobs for local contractors, reduces waste and improves business opportunities. So I am glad to join the conversation today.

There are a lot of great energy efficiency bills on your agenda. I would like to speak about four of them briefly, if I might.

The first is a bipartisan bill that I introduced in the last Congress and have reintroduced in this Congress with Senators Collins, Reed of Rhode Island and Shaheen of New Hampshire. It is the Weatherization Enhancement and Local Energy Efficiency Investment and Accountability Act, otherwise known as S. 703. This bill reauthorizes two critical energy programs for five more years, the Weatherization Assistance Program and the State Energy Program. Both programs have been at work in all of our states for decades. These programs link national, state and local interests together in a critical way. They create highly effective public/private partnerships that have delivered measureable results.

For every dollar invested the Weatherization Assistance Program returns \$2.51 in household savings and has served 7.4 million families including more than a million in just the last four years.

The results are similarly impressive for the State Energy Program where for every Federal dollar invested there is an annual energy cost savings of more than \$7 and nearly \$11 in non-Federal funds have been leveraged. Our bill is not just about reauthorization. It is also about modernization. First, we have cut the authorization levels by more than half from the 2007 Energy bill. Second, we are proposing a complementary, competitive grant program to bring in new partners, new approaches and new ideas to ensure that more homes can be weatherized and that the weatherization being done is being done more efficiently. All told S. 703 supports both base programs and enhances them with new ideas and ultimately ensures their long term viability so we can continue making a difference in our states and communities.

Another key piece of the energy efficiency puzzle is ensuring the Federal Government better uses energy efficiency and cleaner energy. This can be done through the use of Energy Savings Performance Contracts or ESPCs, well known to many of this Committee. ESPCs provide valuable ways for public agencies to make investments in energy efficiency at no cost to the taxpayer.

I have been working with a steadfast advocate of ESPCs, Senator Cory Gardner of Colorado, to advance the energy savings through Public/Private Partnerships Act.

As a related issue, as many of you know, we also need to fix CBO's scoring treatment of ESPCs and several of us here today have been working to fix that scoring hurdle through this year's budget. If successful, this bill, along with other policy ideas, can be advanced without running into that artificial hurdle to bring about many benefits for Federal facilities and programs. It is through efforts like ESPCs that we can put more American electricians and plumbers and local building contractors to work.

Now the bill that has really been one of the most significant pieces of energy efficiency legislation offered in Congress in many years is one with which we are all familiar and to which Senator Shaheen will speak momentarily, S. 720, the Energy Savings and Industrial Competitiveness Act. I am proud to have been a co-sponsor. Senators Portman and Shaheen have diligently worked to get several of their provisions recently passed into law, but it is critical we continue to pass, press for passage, of the entire bill.

Senator Gardner, I was just speaking about our ESPC bill a moment ago.

Last, while energy efficiency is one crucial part of our larger energy challenge, I would briefly like to mention a bill related to the bigger energy picture. The Administration, as you well know, just released its Quadrennial Energy Review report which provides a valuable snapshot of our energy infrastructure needs. I'm glad this Committee held a hearing on the QER just last Tuesday and we should ensure that this and future Administrations continue to carry out such reviews to inform the national energy discussion. That is why I recently introduced S. 1033 with Senator Alexander to ensure that QERs become codified into law so that each successive Administration follows through on this important audit of our nation's energy policies and needs.

Madam Chair, Ranking Member, members of the Committee, I would just like to thank you for your leadership and your attention to the important opportunity that energy efficiency holds for our country. I am glad energy efficiency continues to be an important, valuable and bipartisan issue that owes, in no small part, to your leadership and the collective efforts of many colleagues present today.

Our energy challenges may be great, but I fervently believe we can meet them by working together on sound, common sense policies such as the bills discussed today.

Thank you, Madam Chair.

The CHAIRMAN. Thank you, Senator Coons. Know that we look forward to working with you, not only on the weatherization enhancement but also the other measures that you are clearly engaged on. You have been a cooperative, willing and engaging partner, and we look forward to continuing that.

Next let's go to Senator Shaheen for your comments on the Energy Savings and Industrial Competitiveness Act, an act that you and Senator Portman have led for years now. As has been noted, there have been incremental pieces that we have advanced through the process. I think it is fair to say that when we had these initial discussions about how you move forward on Shaheen/Portman we all thought that we were going to be pursuing the low hanging fruit. We all thought that this was going to be the easy energy bill

that we move forward. Unfortunately, due to a host of varying and complicating factors, that did not prove to be so, but I still believe, very strongly, that this should be that area where regardless of where you're coming from on fossil versus renewables versus how we build out our capacity that when it comes to energy efficiency we ought to be able to figure out a positive and a constructive path forward.

I thank you both for your diligence and your continued efforts to remind us of the opportunities that we have within efficiency. I look to you, truly, as the leaders.

Senator Shaheen, we will lead off with you and then I would like to turn to you, Senator Portman, for your comments on your legislation after which we will move down the line to listen to the other measures that we have in front of us.

Senator Shaheen.

**STATEMENT OF HON. JEANNE SHAHEEN, U.S. SENATOR FROM  
NEW HAMPSHIRE**

Senator SHAHEEN. Thank you, Madam Chair and thank you and Ranking Member Cantwell for holding this hearing this morning, to the members of the Committee for all of the great work that's going on. I am very excited that you are talking about a comprehensive energy bill that is going to start with energy efficiency because it is, as you both said so eloquently, the cheapest, fastest way to deal with our energy needs.

I want to just salute my partner in this effort to pass the Energy Efficiency and Industrial Competitiveness Act, Rob Portman. He actually had dark hair when we started on this initiative. [Laughter.]

We are both getting older while this is going on. This is legislation that I sometimes call Shaheen/Portman. He calls it Portman/Shahen. [Laughter.]

But whatever you want to call it, it is a big step toward a smart, energy policy for this country. And I just want to thank Senator Portman for his very productive partnership in this effort.

As you pointed out, Madam Chair, earlier this year with the Committee's assistance and I want to recognize Senator Hoeven, Senator Klobuchar, and Senator Franken for their effort to help us pass a targeted version, a mini version of energy efficiency that included three provisions that passed by a voice vote. The House followed suit last week, and the President is going to sign it into law. It will be the first energy bill that has passed Congress this year. So I think, hopefully, that bodes well for the opportunity to do more in energy efficiency.

I do not want to spend a lot of time talking about the legislation that Senators Coons, Schatz and Collins are all here also to address, but I just have to say I think there are some terrific ideas. I am proud to co-sponsor a number of those.

I do want to highlight, as Senator Coons did, the bill that he and Senator Gardner are working on because I think there is tremendous opportunity for us in the Federal Government to save money through energy savings performance contracts. They are no brainers, I think, as we look at how we can save money.

And as, again, everyone has said so eloquently, energy efficiency is something that we can all get behind. This brings us together on a bipartisan, bicameral basis.

Now, since the early 70s we have, through efficiency, saved about or reduced our energy use in this country by about 60 percent. I think it shows what could be done if we can pass Portman/Shahen in this session of Congress.

By 2030 if we pass the legislation the bill would create almost 200,000 jobs, cut carbon emissions by the equivalent of taking 22,000,000 cars off the road and save consumers over \$16 billion a year. So this is a win/win/win.

As the Chair alluded we introduced this bill first in the 112th Congress, then the 113th Congress. So I'm hoping the third time is a charm. It has tremendous support from all sectors, people who do not usually all support the same bill, environmental groups, business groups from the U.S. Chamber to the American Chemistry Council, to labor organizations because it creates jobs, it reduces costs to consumers and it is good for saving on pollution.

So, Madam Chair, as the Committee is thinking about moving this comprehensive energy bill, I hope you will think about the opportunity to mark up and move separately the Energy Savings and Industrial Competitiveness Act because it has already been vetted, because this Committee has had a chance to look at it in the last two Congresses. I'm hoping that you will agree with me that it deserves a separate examination that is outside of the comprehensive energy legislation and then if the Committee feels that you need to put it back in, I certainly understand that. But I hope that given all of the work that has been done that you might be willing to consider this as a separate bill outside of the efficiency title in the legislation.

So, again, I thank you for the opportunity to be here, and I look forward to seeing the great work that's going to come out of this Committee on a comprehensive energy bill, including efficiency. Thanks.

The CHAIRMAN. Thank you, Senator Shaheen, and know how carefully we are reviewing all of this. I think it is worth noting the three of you at the table here this morning are all former members of this Committee and have all contributed significantly in the area of energy. So it is nice to know that you have not lost that interest just because you moved on out of this Committee room. I would like to ask—

Senator CANTWELL. Madam Chair, if I could just add to that point.

It is certainly a loss when we lose members from this Committee, but the fact that so many of them go on to the Appropriations Committee we will make sure we are keeping in contact with them [Laughter] as it comes to the funding of various energy programs. Thank you.

The CHAIRMAN. Duly noted.

Senator Portman, as truly a leader for years in this area and continuing to be so, I would like to invite your comments on the Energy Savings and Industrial Competitiveness Act. It is hard for me to say that because we just referred to it as Shaheen/Portman or Portman/Shahen and recognize you and your leadership with it.

**STATEMENT OF HON. ROB PORTMAN, U.S. SENATOR FROM  
OHIO**

Senator PORTMAN. Great.

Well, thank you and thanks Madam Chair, not just for your willingness to hold this hearing today and this is going to be a good opportunity for us to hear about a lot of great ideas in energy efficiency, but importantly to me, your personal commitment to this representing a state that produces a lot of energy your motto has been let's produce more but let's also use what we produce more efficiently.

I think that is exactly where most Americans are. And what we can and should do, there is so much potential for us to become more competitive, to help the environment and create more jobs by doing so.

Second, thank you for your support of this legislation. From the start you were one of our original co-sponsors. You have been working with us. It has been on the Floor twice, as you know, and for really unrelated reasons was not able to get it through. We have continued to improve the legislation.

I think about, listening to my colleague, Senator Shaheen, talk about it, we added, I think, ten additional bipartisan provisions the last go round in the last Congress which not only got us more co-sponsors, but a lot more support from the outside. And we continue to refine the measure. We have now reintroduced it, I think, with a good, broad, bipartisan support of members but again, importantly taking in great ideas. One, by the way, we would love to include is ESPCs. And the problem with ESPCs in the past has been we have not been able to get a score that really is consistent with the reality of the savings that can occur from these contracts.

And I am on the Budget Committee. As the Ranking Member was saying, it is good to have members on other Committees, and we were able to get in language in the budget to have CBO properly, I would view, score these.

So this helps us in terms of our costs because as you know Portman/Shahen, Shahen/Portman, we will call it S. 720, does not have a cost. We eliminate some authorizations at the Department of Energy. We have no mandates in it. I mean, we have been very careful to keep this group together by not having this be a fiscal problem. With this new ESPC language we will be able to include, I believe, some additional elements there.

By the way, it only applies to the Senate not the House which could make matters interesting going forward in terms of the ESPC scoring mechanism, but I am glad we had that little victory and I appreciate Senator Coons coming today and talking about that.

Also, Senator Collins talked about the coordination of retrofitting schools, great idea.

I am a co-sponsor of Senator Coons' bill but also a co-sponsor of her bill. Her bill is part of the Portman/Shahen bill, and we think that is one of the great opportunities here with regard to the building side and specifically our school buildings.

We are really interested in moving this bill forward, getting it to the Floor, this time. The third time is a charm having the ability to have a substantive discussion and to allow people to offer

amendments, but also to allow us to actually get something done that we think can be, not just bipartisan, but bicameral.

Cory Gardner, who just left the House, is here, and he was one of our leaders in the House. Hopefully he left some folks behind who understand the importance of this legislation, but we do have support on both sides of the aisle in the House.

I just want to thank Senator Shaheen. We have worked on this for three and a half, maybe four years now. As she said, I had dark hair when this started. [Laughter.] Senator Gardner says that my hair is lighter because it reflects the sun better which is more energy efficient. [Laughter.] But that was not purposeful.

Senator Shaheen has been a stalwart. Frankly, both of us have had to work with both of our caucuses on moving this forward because it is a consensus bill. Again, it is a bill that can actually, in my view, get through to the President for his signature.

We really appreciate your willingness, Madam Chair, to push that through. I know that you have a personal commitment to this, but you are also willing to recognize three and a half years of hard work and over 270 organizations and trade associations and the fact that this would make a big difference to the equivalent of energy savings that would take 80,000,000 homes off the grid by 2030, cumulative savings, about \$100 billion, 190,000 jobs created.

It does a lot of good things. Reducing emissions, cutting carbon emissions equivalent to taking 22,000,000 homes or 22,000,000 cars off the road by 2030. It is cost effective, and it adds jobs in places like my home state of Ohio. The manufacturers are really excited about it.

We hope this is proof that bipartisanship is not dead on Capitol Hill because it passed the Committee last Congress with a strong bipartisan vote of 19 to 3, and I am hopeful we can do that again this year, get this moving quickly, get that strong show of support in the Committee which will help us to get it through the Floor and make this good idea a reality.

Thank you, Madam Chair.

The CHAIRMAN. This is all about taking good ideas and turning them into law. It is a good thing.

Senator Schatz, you have been very engaged in several different initiatives. This morning you are going to speak to us about the Utility Energy Services Contract Improvement Act as well as the PREPARE Act, Promoting Regional Energy Partnerships for Advancing Resilient Energy Systems Act.

Again, we appreciate your leadership here on the Committee and know that you are taking that interest to the other Committees you currently serve on. So, welcome back and we are looking forward to hear your comments this morning.

**STATEMENT OF HON. BRIAN SCHATZ, U.S. SENATOR FROM HAWAII**

Senator SCHATZ. Thank you. Good morning, Chair Murkowski, members of the Committee, I miss you. [Laughter.]

I want to thank you for the chance to address the Committee and thank you for undertaking this effort to assemble comprehensive energy legislation in a bipartisan manner. I am especially grateful that you are beginning this effort with a look at energy efficiency

which we all know is the least expensive, most effective way to reduce energy costs.

I am going to take some time to talk about two bills I have introduced that focus on energy efficiency and grid modernization.

The first bill, S. 723, the Utility Energy Service Contracts Improvement Act of 2015, provides parity between two types of energy savings contracts with Federal agencies. Co-sponsored by Senators Alexander, Coats and Coons, it is endorsed by the Edison Electric Institute and the Bristol Bay Native Corporation which has a subsidiary that does a significant amount of work with UESCs.

UESCs are similar to ESPCs. Both are financing vehicles that allow Federal agencies to invest in efficiency improvements and energy conservation measures to reduce energy use and save money. The primary difference is that UESCs allow the client to work directly with the utility, an existing relationship, while ESPCs are offered by energy service companies, ESCOs.

Under the current law Federal agencies can enter into energy savings performance contracts for up to 25 years; however, Congress does not specify guidelines for UESCs leaving the contract terms up to interpretation. Several agency interpretations have limited UESCs to only ten years and this has resulted in lost opportunity and significant underutilization and a potential loss of energy and financial savings to the Federal Government.

Our bipartisan bill does one simple thing. It clarifies that Federal agencies may enter into UESCs of up to 25 years just like ESPCs provided that the energy savings are measured and guaranteed. It is a simple, common sense bill.

My second bill on the agenda is S. 888, promoting Regional Energy Partnerships for Advancing Resilient Energy Systems Act, the PREPARE Act. The PREPARE Act is co-sponsored by Senator Heinrich and has the endorsement of the National Association of State Energy Offices.

U.S. energy systems and infrastructure are currently in a period of significant change. The majority of energy assets are ready for retirement or replacement. Decisions made today will have lasting impacts over the next 40 to 50 years, and I know Chair Murkowski knows that as important as national policy is, it is often times public utilities commissions, local utilities, local energy companies, that make the driving difference in terms of our energy future.

The PREPARE Act recognizes this reality and leverages the DOE and the national labs to provide direct financial and technical assistance to states and regions that want to strengthen and streamline their energy systems. The bill directs DOE to act as a sort of consultant to the states, working with key stakeholders to ensure that planning efforts have the necessary resources and focus.

The PREPARE Act draws on the experience of two successful energy partnership programs. One is the Hawaii Clean Energy Initiative initiated by Republican Governor Lingle and President Bush in 2008. It is underpinned by an agreement between DOE and the Hawaii State Energy Office. The second is the DOE State Energy Program which provides funding and technical assistance to state energy offices to prepare state energy plans and implement energy efficiency programs. Since its creation in '96 it has delivered energy cost savings of over \$250 million a year, and this legislation is ag-

nostic on the direction that individual states and regions should take with respect to their energy futures. It simply directs the DOE to utilize its resources to assist in a planning process so that we modernize our grid and that we have the most efficient and effective energy systems that work for our individual states. It creates a voluntary program and recognizes the need for long term, holistic planning.

I want to thank Chair Murkowski for assembling such a good, bipartisan group and for considering this and other excellent pieces of legislation.

The CHAIRMAN. Thank you, Senator Schatz.

You know, as I listened to your comments and that of the other members that we have heard so much of this, yes, it is about efficiency. It is also about us doing a good job of understanding what is out there within our agencies, how we can be more efficient from just an oversight perspective. Knowing what we have and utilizing it to its best advantage.

This kind of ties in with what our fourth title in this energy, overall, energy legislation will be which is accountability, making sure that what we have in place actually makes sense. What you have laid out in front of us today is good stuff, and we will look forward to working with you as well.

Senator SCHATZ. Thank you.

The CHAIRMAN. Thank you for coming back to the Committee.

And now, let's go up north a little bit to Minnesota. Our colleague, Senator Klobuchar, is here to talk about energy efficiency retrofits and how we can best utilize them to gain efficiencies.

Welcome to the Committee, Senator Klobuchar.

**STATEMENT OF HON. AMY KLOBUCHAR, U.S. SENATOR FROM MINNESOTA**

Senator KLOBUCHAR. Well, thank you so much, Madam Chair and thank you to Ranking Member Cantwell and all the members.

I was sitting here hearing about how everyone used to serve on this Committee. I did not, but I have friends and neighbors on the Committee including my colleague, Senator Franken, and then also, of course, my neighbor, Senator Hoeven, who has been the lead Republican on this bill.

The two of us were also excited to be part of the Shaheen/Portman Energy Efficiency bill that passed at the end with our water heater provision that was supported by a lot of the energy groups on energy efficiency, environmental groups as well as the rural electrics. We were really glad that is being signed into law today as part of that package.

I want to thank Senator Stabenow, our Ranking Member on Agriculture, as well as Senator Risch for co-sponsoring this bill. I know they are both members of this Committee as well as Senator Blunt and Senator Schatz.

The Non-Profit Energy Efficiency Act provides assistance to non-profit organizations to help them make their buildings more energy efficient. I think we all know that these organizations are the heart of our country. They are places like schools and hospitals, faith-based organizations, youth centers, nonprofit entities, just the kind of entities that would be interested in having their buildings be

more energy efficient. We all know it will help them save money as they help other people.

They also tend to be located in older buildings, thus many of these nonprofits are faced with a difficult choice regarding investments in energy efficiency. They are often the first to forego energy efficiency measures that would save money for them in the long haul because of their costly, up front, capital investments which divert their scarce resources away from the services they are trying to provide. They really are perfect for these kinds of grant programs, and because of their tax exempt status nonprofits are currently unable to utilize the existing tax credit or rebate programs even though they would benefit from them.

So what our bill does is it establishes a pilot program at the U.S. Department of Energy. Grants can be used for up to \$200,000 per building. The costs of it are offset by other Department of Energy grants and would be subject to a 50 percent local match requirement.

The bill includes provisions to ensure that the projects achieve significant amounts of energy savings and are completed in a cost effective way.

It is also important to note that the bill would not score and that the funds, again, are a carve out of existing resources that are used for commercial buildings yet we have all these older buildings that the nonprofits have been using where they have not been able to retrofit them.

The legislation is supported by a broad coalition of organizations including the National Council of Churches, as well as the Union of Orthodox Jewish Congregations of America, the Interfaith Power and Light, YMCA and there are a number of other faith-based organizations that are big supporters of this.

The bill has a bipartisan House companion. It is being introduced today by Representative Cartwright, a Democrat from Pennsylvania, and Representative Dold, a Republican from Illinois, and I think this is an area that has long been overlooked, the ability of nonprofits to utilize tax credits to retrofit.

I want to thank this Committee for the bipartisan work that you've done in this area. I think it is actually a very exciting area for us to move on. We did a few weeks ago, but also to move even further with some of the bills that are out there, including Senator Portman, Senator Shaheen, the other one discussed today and all the work of the Committee members.

Thank you very much.

The CHAIRMAN. Senator Klobuchar, thank you. We all want to make sure that our nonprofits have what they need, particularly in times of tough budgets both at the Federal and state levels and the ways that you can save money is with efficiency, with your energy, so working with you on this is something that we look forward to doing.

Senator HOEVEN. Madam Chairman, if I may?

The CHAIRMAN. Senator Hoeven, yes.

**STATEMENT OF HON. JOHN HOEVEN, U.S. SENATOR FROM  
NORTH DAKOTA**

Senator HOEVEN. I just want to express my thanks to the good Senator from Minnesota for sponsoring this bill. I am very pleased to co-sponsor it with her, and of course, the good Senator from Michigan and others who are on this legislation.

It is bipartisan, and I think it is something that would be very helpful. We have heard a lot from the nonprofit groups that this is something they would use. This is one of those programs that they say, this is what we want. We will use it.

That is important because sometimes we pass legislation, it sets up programs and they are not used. But this is one that, I think, will be very much in demand.

I just want to read some of the organizations. Senator Klobuchar mentioned just a couple, but if I could mention a few more. I think she mentioned the Union of Orthodox Jewish Congregations of America, but we also have the U.S. Conference of Catholic Bishops, the Association of Art Museum Directors, the Evangelical Lutheran Church in America, the General Conference of Seventh Day Adventists, Friends of Committee on National Legislation, Jewish Federation.

Particularly nonprofit religious groups, have really lined up and said this is something, you know, for our church, our temples, whatever it is. This is something that can make a big difference for us.

It is not a huge amount when we say up to \$200,000. Of course, they will have to put in matching dollars, but it is one that really, I think, would have a big impact and would be used.

And so, again, I want to thank and commend Senator Klobuchar and ask the Committee for their support on this legislation.

Senator FRANKEN. Madam Chair.

The CHAIRMAN. Thank you, Senator Hoeven. It is important and something that we would like to include.

I know that members have a great deal of interest in so many of these bills. I want to give us all a chance to either speak to either Senator Klobuchar and Hoeven's bill or others, but I also recognize that we do have a second panel that we want to get to.

Senator FRANKEN. Sure.

The CHAIRMAN. Senator Franken.

Senator FRANKEN. I just wanted to clarify when he says the good Senator from Minnesota that he was not saying in contrast.

Senator KLOBUCHAR. No, it is not like the Good Witch and the Bad Witch.

Senator FRANKEN. Yeah. Okay, okay.

Senator KLOBUCHAR. We, no, no, not our friend from North Dakota, no.

Senator FRANKEN. That was it. That was all.

Senator KLOBUCHAR. Alright.

The CHAIRMAN. Okay.

I thought you were going to share something really erudite on this great, great legislation. [Laughter.]

Senator KLOBUCHAR. He can call me Glinda.

Senator FRANKEN. What would the chances of that be? [Laughter.]

The CHAIRMAN. Well, all I was thinking was that every church that I go into is always cold. So I know they are saving energy. [Laughter.] But we warm it up.

Again, to the members of the Committee, I know that each of us have many pieces of good legislation that are, perhaps, part of the 22 bills that we are considering today. If you would care to make brief comments now before the Committee or submit something for the record, we are certainly happy to allow for that.

Senator Gardner.

**STATEMENT OF HON. CORY GARDNER, U.S. SENATOR FROM COLORADO**

Senator GARDNER. Thank you, Madam Chair, and thank you for this hearing today. I think we are doing some great work, and obviously Senator Coons mentioned some of the work that we are doing together. I commend him for his leadership when I was in the House and now in the Senate together on Energy Savings Performance Contracts.

The Federal Government is the largest office holder in the country, somewhere around two billion square feet of office space. We have got \$20 billion worth of potential opportunities when it comes to savings from energy savings performance contracts, reducing emissions, creating thousands of private sector jobs, saving the taxpayer money. This is that win/win/win/ trifecta that we do not often get to talk about.

So, again, thank you for your opportunity today. Senate bill 858, we are still looking for co-sponsors. Anybody can join this. We are excited to work on energy savings performance contracts, U.S. goes to the utility side as well as we continue the good work that we are pursuing right now on energy efficiency and savings.

The CHAIRMAN. Fabulous, we look forward to that.

I still think we can deal with the air conditioning here in this building and save a lot of money. That is going to be my next pitch.

Senator Stabenow.

**STATEMENT OF HON. DEBBIE STABENOW, U.S. SENATOR FROM MICHIGAN**

Senator STABENOW. Thank you, Madam Chair.

And on the Floor there.

The CHAIRMAN. Yes.

Senator STABENOW. It gets a little free.

I just want to say thank you for holding the hearing, and we look forward to our second panel.

But you know, for years we have talked about vehicle efficiencies which are critical in terms of mileage efficiencies and so on. It is so important I think to stress that about 30 percent of our energy use is in transportation, very, very important. We have made great headway there.

But 40 percent is in buildings. And so when we talk about this and the fact is, as has been said before, at least 22,000,000 vehicles could be taken off the road by 2030 if we, the equivalent of that, in terms of energy efficiency in buildings. I want those vehicles actually on the road, purchased vehicles in Michigan.

But when you look at the capacity to save energy and reduce carbon from addressing these issues, I really hope this will be at the top of our list. I think it is really important.

Thank you.

The CHAIRMAN. Thank you, Senator Stabenow.

Thank you Senator Klobuchar for joining us this morning before the Committee.

Let's now go to our second panel and hear from them this morning on these various measures that are before the Committee.

At this time I would ask Dr. Kathleen Hogan to join us.

Dr. Hogan is the Deputy Assistant Secretary for Energy Efficiency at the Office of Energy Efficiency and Renewable Energy at DOE. Next to her we have Mr. Tony Crasi, who is here on behalf of the National Association of Home Builders, and he is the owner of the Crasi Company Incorporated. We also have Dr. Ted Gayer with us. Mr. Gayer is the Vice President and Director of Economic Studies at the Brookings Institute. So welcome to you this morning. We have Mr. Steven Nadel, who is the Executive Director for the American Council for an Energy Efficient Economy. He has been before the Committee before. Welcome back. And we have a friend of mine and fellow Alaskan, Mr. Gene Therriault, who is with us, who is the Vice Chairman of the National Association of State Energy Officials as well as the Deputy Director of the Energy Policy and Outreach for the Alaska Energy Authority. He has come a long way to be with us, but his insight on not only those Alaska related issues, but national issues is greatly appreciated and respected. So, welcome to the Committee this morning.

We will begin with you, Dr. Hogan. If you would give us five minutes or less, know that your full statement will be included as part of the record, but we look forward to your comments this morning.

**STATEMENT OF DR. KATHLEEN B. HOGAN, DEPUTY ASSISTANT SECRETARY FOR ENERGY EFFICIENCY, OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY, U.S. DEPARTMENT OF ENERGY**

Dr. HOGAN. Thank you and good morning, Madam Chairman Murkowski, Ranking Member Cantwell and members of the Committee. And thank you for the opportunity to testify today on behalf of the Department of Energy's Office of Energy Efficiency and Renewable Energy, also known as EERE.

As the Deputy Assistant Secretary for Energy Efficiency at EERE, I oversee DOE's portfolio of energy efficiency activities, building technologies, advanced manufacturing, weatherization and intergovernmental programs and Federal energy management program offices, develop and help businesses, consumers and government agencies with innovative, cost effective, energy saving solutions to improve their energy efficiency. And this ranges from higher efficiency products to new ways of designing homes and buildings to new ways of improving the energy intensity and competitiveness of American manufacturers.

We have all spoken to energy efficiency, being a large, low cost and underutilized U.S. energy resource. Increased energy efficiency offers savings on energy bills, opportunities for more jobs, improved

industrial competitiveness and lower air pollution. And I am very pleased to be here today and look forward to working with Congress and this Committee in particular to talk about how we can expand the use of energy efficiency to help address our nation's energy challenges.

I've been asked to testify on 22 energy efficiency bills currently before the Committee. While the Administration is still reviewing these bills we certainly do want to express our support for the ongoing bipartisan efforts to promote energy efficiency. And we do look forward to continuing to work with the Committee with the range of bill sponsors.

So the Administration does continue its support for the underlying goals of S. 720, the Energy Savings and Industrial Competitiveness Act of 2015 as many of the sections of S. 720 match those in a similar bill the Administration supported in 2013. Many of the provisions of S. 720 would support Administration's efforts to strengthen U.S. competitiveness through significant research and development investments in manufacturing, innovation and productivity such as the Department of Energy's Clean Energy Manufacturing Initiative. And it would complement other Administration energy efficiency initiatives for our homes, buildings, and industries.

The Department continues to review the changes in S. 720 and again, looks forward to working with the bill's sponsors and this Committee to cut energy waste, save money and reduce pollution.

The additional bills on the docket today address many important aspects of energy efficiency today including but not limited to, the Federal use of energy savings performance contracts, utility energy savings contracts and Federal energy efficiency efforts more broadly, all of which contribute to reducing the energy intensity of Federal facilities, lowering bills and providing environmental benefits.

They also address energy efficiency for commercial and residential buildings which, as we've heard, consume more than 40 percent of the nation's total energy and actually more than 73 percent of its electrical energy and of course, continue to represent significant opportunities for energy and cost savings.

The bills address appliance efficiency standards which are currently saving consumers more than \$50 billion annually, and we know that there are opportunities for additional savings there.

They address reauthorization of the critical Weatherization Assistance Program and state energy program which help low income households benefit from cost savings as among other benefits, and they assist states in establishing and implementing programs to reduce energy costs, enhance economic competitiveness and improve the environment.

And they look for opportunities, new opportunities, for energy efficiency activities at the local and municipal levels which is also something the Administration seeks to address in our budget request through something called the Local Energy Program.

So EERE's program offices are implementing a variety of strategies to improve the efficiency of our homes, buildings and manufacturers similar to the activities highlighted in the legislation before the Committee today. And expanding R and D to breaking down

persistent market barriers that I think we all recognize limit the use of cost effective measures.

And I am proud to report that we are making great progress on energy efficiency, reducing reliance on oil and saving American families and businesses money and reducing pollution. I have many more examples in my written testimony, but I think we can all agree that there is much more that can be done.

So let me just reiterate my appreciation for the ongoing bipartisan efforts and our continuing interest to work with the Committee on the range of bills and the sponsors of them as this legislation continues to work its way through Congress.

I am happy to answer any questions today.

[The prepared statement of Dr. Hogan follows:]

**Statement of Dr. Kathleen Hogan  
Deputy Assistant Secretary for Energy Efficiency  
Office of Energy Efficiency and Renewable Energy  
U.S. Department of Energy**

**Before the  
Committee on Energy and Natural Resources  
United States Senate**

**April 30, 2015**

**Introduction**

Chairman Murkowski, Ranking Member Cantwell, and Members of the Committee, thank you for the opportunity to testify today on behalf of the Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE) regarding energy efficiency.

In support of the Administration's all-of-the-above approach to energy and the Climate Action Plan, EERE leads DOE efforts as the U.S. Government's primary clean energy and energy efficiency technology organization—working with some of the Nation's best innovators and businesses to support high-impact applied research, development, and demonstration (RD&D) activities in the three sectors under our purview: sustainable transportation, renewable power, and energy efficiency. With Congress's support, we implement a range of strategies aimed at reducing U.S. reliance on oil, saving American families and businesses money, creating jobs, and reducing pollution. We work to ensure that the clean energy and energy efficiency technologies of today and tomorrow are invented and manufactured in America.

As Deputy Assistant Secretary for Energy Efficiency in the Office of Energy Efficiency and Renewable Energy (EERE), I am responsible for overseeing DOE's portfolio of energy efficiency research, development, demonstration, and deployment activities. The Building Technologies, Advanced Manufacturing, Weatherization and Intergovernmental Programs, and Federal Energy Management Program Offices develop and help provide businesses, consumers, and government agencies with innovative, cost-effective energy-saving solutions to improve their energy efficiency—from higher-efficiency products, to new ways of designing homes and buildings, to new ways of improving the energy intensity and competitiveness of American manufacturers. EERE's energy efficiency portfolio also supports better integrating the built environment with our energy system to combat costly peaks in energy demand and to increase the capabilities and value of buildings and facilities.

Energy efficiency is a large, low-cost, and underutilized U.S. energy resource. Increased energy efficiency offers savings on energy bills, opportunities for more jobs, and improved industrial

competitiveness, and it will lower air pollution. I am pleased to be here today and look forward to working with Congress, and this Committee in particular, to talk about how we can use energy efficiency as a tool to help address our Nation's energy challenges. My statement today will address the energy efficiency bills currently before the Committee, and provide an update on DOE's energy efficiency portfolio, the challenges we are working to address, and the progress we are making.

**Energy Efficiency Legislation**

I have been asked to testify on 22 energy efficiency bills currently before the Committee. In my testimony, I will address:

- S. 720 – Energy Savings and Industrial Competitiveness Act of 2015;
- S. 703 – Weatherization Enhancement and Local Energy Efficiency Investment and Accountability Act. This bill reauthorizes the Weatherization Assistance Program from fiscal year 2016 through fiscal year 2020, and seeks to establish a competitive grant program to expand the number of low-income, single-family and multifamily homes that receive energy efficiency retrofits.; and
- S. 858 – Energy Savings Through Public-Private Partnerships Act of 2015. This bill seeks to encourage the use of Energy Savings performance contracts and Utility Energy Service Contracts in federal government buildings.

The Administration continues to review all of the legislation on the docket today and I am happy to answer questions more specifically on the 22 bills for the record. However, I will reiterate my appreciation for ongoing bipartisan efforts to promote energy efficiency and look forward to continuing to work with the Committee and the range of bill sponsors as legislation works its way through Congress.

The Administration continues its support for the underlying goals of S. 720 - as many of the sections of S. 720 match those in S. 1392, the similar 2013 bill that the Administration supported. However, there are sufficient changes in S. 720 that warrant further review before a position on the full bill can be established. Many provisions of S. 720 would support the Administration's efforts to strengthen U.S. competitiveness through significant research and development investments in manufacturing innovation and productivity, such as the Department of Energy's Clean Energy Manufacturing Initiative, and complement key energy efficiency dimensions of the President's Climate Action Plan. The Department continues to review the changes in S. 720 and looks forward to working with the bill sponsors and this Committee to cut carbon pollution and begin to slow the effects of climate change.

In addition, the Department is still reviewing S. 703 and S. 858, and does not have a position on them at this time. DOE does, however, support the overall objective of S. 703 to reauthorize

DOE's existing Weatherization Assistance Program (WAP) and the State Energy Program (SEP) and recommends that authorization also be provided for the Local Energy Program (LEP), as outlined in the FY 2016 Budget. WAP provides grants to states, territories, and some Indian tribes to improve the energy efficiency of the homes of low-income families. SEP provides funding and technical assistance to state and territory energy offices to help them advance their clean energy economy while contributing to national energy goals. The proposed LEP compliments these programs, serving as a catalyst for developing creative and effective solutions through local-level projects. While DOE supports the reauthorization of WAP and SEP, we note that existing law authorizes appropriations for SEP at \$125 million per year. S.703 would change the amount to \$75 million per year for Fiscal Years 2016 through 2020. The lowered amount for authorization for SEP may not be sufficient for States to complete projects contemplated under SEP, given the significant role of states in energy efficiency, renewable energy, and energy emergency planning across the U.S. In addition, DOE supports the intent of S. 858 to encourage the use of Energy Savings performance contracts and Utility Energy Service Contracts which permit federal agencies to implement energy efficiency, renewable energy and water-efficiency projects that save energy, reduce greenhouse gas emissions and save taxpayer dollars.

#### **EERE's Energy Efficiency Portfolio**

EERE's program offices are implementing a variety of strategies to improve the efficiency of our homes, buildings and manufacturers, similar to the activities highlighted in the legislation before the Committee today.

#### ***Building Technologies***

Improving energy efficiency in our homes and buildings offers a tremendous opportunity to create well-paying jobs, save money for businesses and consumers, and make our air cleaner. Residential and commercial buildings consume more than 40 percent of the Nation's total energy and more than 73 percent of its electrical energy<sup>1</sup>, resulting in an estimated annual national buildings energy bill of more than \$430 billion.<sup>2</sup> This energy bill can be reduced by 20-50 percent through a variety of existing and emerging building energy efficiency technologies and techniques once these solutions are successfully developed, commercialized, and proven to be cost effective.

<sup>1</sup> Monthly Energy Review, Energy Information Administration, U.S. Department of Energy, November 2014, <http://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf>.

<sup>2</sup> Annual Energy Outlook, Energy Information Administration, U.S. Department of Energy, April 2014, [http://www.eia.gov/forecasts/aeo/pdf/0383\(2014\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2014).pdf).

EERE's Building Technologies Program (BTO) will continue to develop and demonstrate advanced building efficiency technologies and practices to make buildings in the U.S. more efficient, affordable, and comfortable. Key recent EERE accomplishments in BTO include the following:

- **Helping American commercial, industrial, and multifamily buildings become at least 20 percent more energy efficient by 2020.** Through the Better Buildings Challenge, more than 250 partners are achieving average energy savings of 2.5% annually. These partners are on track to achieve the goal of more than 20% energy savings over 10 years and have saved 36 trillion Btus and \$300 million since the Challenge began in 2011.
- **Curbing greenhouse gas emissions with advanced refrigeration systems.** Through the Building Technologies Office's Emerging Technologies R&D program, a leading commercial refrigeration manufacturer worked with Oak Ridge National Laboratory to design a refrigeration system with 25% lower energy consumption and 78% lower GHG emissions than existing systems.
- **Providing consumers billions of dollars in energy savings.** As part of President Obama's Climate Action Plan, the Energy Department finalized ten energy efficiency standards in 2014. Altogether, those ten standards will help reduce carbon dioxide emissions by over 435 million metric tons and save American families and businesses \$78 billion in electricity bills through 2030.

The program uses a three-pronged strategy: (1) High Impact Technology Research and Development—research and development (R&D) targeting the greatest opportunities to develop high-impact new cost-effective energy efficiency products and solutions (i.e., the highest potential market and energy efficiency impact); (2) Technology-to-Market—validating and driving these technology products and solutions into the market by verifying and improving performance and cost, providing improved data and information, and partnering with manufacturers and users; and (3) Lock In Savings—where a government role is appropriate and justified, locking in the savings through market based (e.g., working with the Environmental Protection Agency on the ENERGY STAR Program) and regulatory (i.e., codes and standards) efforts that provide clear public and net economic benefits to both producers and consumers. The program invests in a balanced portfolio of activities that are determined to contribute optimally to national energy efficiency goals.

R&D on next-generation building technologies will lead to advances in end-uses representing the majority of building energy consumption, including efficient lighting that is cost-competitive in today's market, new technologies in heating and cooling, and windows that decrease energy

demands and improve comfort. DOE also invests in whole building R&D that demonstrates how new energy efficient technologies can function together to create an efficient system, achieve greater overall savings, and inspire the next-generation of buildings. For homes, this will translate into a new generation of housing stock that is durable, uses smarter energy management systems, and offers substantial energy savings.

In addition to creating energy efficiency opportunities in the new buildings market, DOE invests in activities that target the large savings potential that exists across the stock of existing homes, many built before modern codes. Here, the Department is working to reduce U.S. building-related energy use in existing homes by 20 percent by 2020 and 40 percent by 2030 through applied research (e.g. how builder/retrofiters can more cost effectively install technical solutions into homes) to: resolve the major technology to market challenges to achieving these goals, develop infrastructure to support the construction or improvement of homes to meet higher performance levels, and demonstrate and then promote higher energy efficiency home retrofit and model homes for new construction that may be implemented at the state and local level.

The Better Buildings Challenge is a signature partnership effort to make our Nation's buildings 20% more energy efficient over the next ten years, with over 250 partners across the commercial, industrial, residential, and public sectors. Together, these partners account for approximately 3.5 billion square feet of building floor space, more than 600 manufacturing facilities, and \$5.5 billion in private sector financing. As partners advance toward meeting their individual goals, the Better Buildings Challenge website<sup>3</sup> will highlight their commitment and progress, including the sharing of showcase projects and hundreds of replicable implementation models that other organizations can adopt. To date, more than \$3 billion of the commitment from private sector financial firms has been extended to projects, and we are continuing to look for ways to expand access to private-sector financing, as this remains an important barrier cited by commercial building owners.

In addition, the Department sets minimum energy efficiency standards for approximately 60 categories of appliances and equipment used in homes, businesses, and other applications, as required by existing law. For most products, Congress passed laws that set initial federal energy efficiency standards and test procedures, and that established schedules for DOE to review and update these standards and test procedures. The Appliance and Equipment Standards Program reduces manufacturers' regulatory burden and costs, and therefore costs to consumers, by providing single national standards in place of a patchwork of state-by-state standards. Since 2009, 25 new or updated standards, covering more than 30 products, have been issued and will ensure annual energy savings over the coming years. The Program is highly effective, achieving

---

<sup>3</sup> The BBC website address is [www.betterbuildings.energy.gov/challenge](http://www.betterbuildings.energy.gov/challenge).

dramatic bang-for-the-buck in energy savings. The cumulative utility bill savings to consumers from energy efficiency standards is estimated to be nearly \$1.8 trillion by 2030.

Further, DOE assists with the adoption and implementation of state and local building codes for both commercial and residential buildings. Building energy codes are an existing solution that can provide between 20-30 percent whole building energy savings. The program assists states and localities in adopting, complying with, and enforcing energy codes for residential and commercial buildings, resulting in higher-performing buildings that maximize cost-effective energy savings. Pacific Northwest National Laboratory estimates the annual impact of these activities to be over 100 trillion Btu of primary energy savings and almost \$780 million in energy cost savings. To accomplish its objectives in this area, DOE has developed a suite of assistance tools it routinely provides to state and local authorities.

In FY2016, DOE has requested \$264,000,000 for the Building Technologies Office.

### *Advanced Manufacturing*

The U.S. manufacturing sector offers important opportunities for cutting energy waste, while improving our industrial competitiveness and promoting economic growth. In the United States, manufacturing represents about 12% of the gross domestic product and nearly 12 million jobs.<sup>4</sup> While being a key sector underlying long-term economic growth, manufacturing also has an annual energy bill of about \$200 billion and uses roughly one-third of the primary energy (and related GHG emissions) in the U.S.<sup>5</sup> U.S. manufacturing can particularly benefit from technologies for energy efficiency across the board, as industry must continually improve productivity and efficiency to remain globally competitive.

EERE's Advanced Manufacturing Office (AMO) partners with industry, small business, universities, and other stakeholders to identify and invest in emerging technologies with the potential to create high-quality manufacturing jobs, enhance global competitiveness of the United States, and reduce energy use by encouraging a culture of continuous enrichment in corporate energy management. Key recent AMO accomplishments include:

---

<sup>4</sup> Full-time and Part-time employees by industry, U.S. Department of Commerce, <http://www.bea.gov/iTable/iTable.cfm?reqid=5&step=4&isuri=1&402=43&403=1#reqid=5&step=4&isuri=1&402=43&403=1>  
Value added by industry as percentage of GDP, U.S. Department of Commerce, <http://www.bea.gov/iTable/iTable.cfm?reqid=5&step=4&isuri=1&402=5&403=1#reqid=5&step=4&isuri=1&402=5&403=1>

<sup>5</sup> Annual Energy Outlook 2014: Reference Case Data, U.S. Energy Information Administration, available from: <http://www.eia.gov/forecasts/aeo/data.cfm>

- **Pushing the boundaries of additive manufacturing.** The EERE-supported Manufacturing Demonstration Facility (MDF) at Oak Ridge National Laboratory collaborated with private sector partners to design and prototype a 3D-printed car – all in just six months. This project was enabled through a partnership between the MDF and industry stakeholders, which developed breakthrough additive manufacturing processes and allowed industry to print more efficiently and on a larger scale than similar commercially available processes.
- **Assuring supply chains of materials critical to clean energy technologies.** The Critical Materials Institute (CMI), an Energy Innovation Hub for the U.S. Department of Energy (DOE), celebrated its second anniversary with twenty-seven invention disclosures. Critical materials, including some rare earth elements that possess unique magnetic, catalytic, and luminescent properties, are key resources needed to manufacture products for the clean energy economy.
- **Saving manufacturers money across the U.S.** Industrial Assessment Centers located within accredited engineering programs at 24 universities across the country conduct energy audit assessments at manufacturers' sites. According to analyses done by the program, on average, each manufacturer identifies about \$140,000 in potential annual energy savings. Almost 17,000 manufacturers have benefited from the program and implemented savings resulting in approximately 5 million metric tons of carbon dioxide emission reductions<sup>6</sup>.

AMO's research, development, demonstration, and deployment investments advance high-impact technologies for energy efficiency in the manufacturing sector in addition to foundational, cross-cutting manufacturing and materials technologies critical to efficient and competitive domestic manufacturing of clean energy products. AMO's investments in foundational technologies are anticipated to have a high impact in helping save energy and improve competitiveness and that will benefit multiple industries in the installed industrial base. When R&D investments are approached in this manner, the extensive supply chains associated with manufacturing multiply the government's initial investments from one industry to multiple applications in other industries and end-use products.

The Program addresses these clean energy manufacturing challenges using three primary modalities of support: research and development of early stage manufacturing technologies through the support of individual R&D projects, pre-commercial technology development

---

<sup>6</sup> Internal analysis based on data from the Industrial Assessment Centers Database, <http://iac.rutgers.edu/database>

through facilities and manufacturing consortia, and technology assistance through manufacturing partnership participation, assessment and evaluation tools.

EERE leads the Department of Energy's *Clean Energy Manufacturing Initiative* which is a Department-wide approach to increase U.S. competitiveness in clean energy manufacturing while advancing progress toward the nation's energy goals. EERE-supported Clean Energy Manufacturing Innovation Institutes are public-private partnerships focusing on RD&D of foundational technologies that are broadly applicable and prevalent in multiple industries and markets within the energy sector and that have potentially transformational technical and productivity impacts for the U.S. manufacturing sector more broadly. All institutes will be actively managed through cooperative agreements with well-defined milestones, and oriented toward clearly stated research objectives and outcomes to ensure timely achievement of all technical, operational, organizational and partnership goals. Also, within 5 years of its launch, each institute is expected to be financially independent and sustainable using only private-sector and other sources of funding without further federal financial assistance.

One example of the Department's efforts in this area include our recently selected Institute for Advanced Composites Manufacturing Innovation, led by the University of Tennessee and headquartered in Knoxville, already has 122 committed partners united toward the common goal of lowering overall costs for manufacturing advanced composites by 50 percent, reducing the energy use to do so by 75 percent, and increasing the ability to recycle composites by more than 95 percent. Advanced composites have the potential to deliver clean energy products with better performance and lower costs, such as lighter and longer wind turbines blades; high pressure tanks for natural gas- and hydrogen-fueled cars; lighter, highly energy-efficient industrial equipment; and lightweight vehicles.

In addition, the Department has released a Notice of Intent to issue a competitive solicitation in 2015 to fund a Clean Energy Manufacturing Innovation Institute focused on smart manufacturing. Smart manufacturing utilizes a suite of tools to enable real-time operational energy efficiency improvements in manufacturing ranging from unit processes to factory-wide integration to enterprise-wide energy management.

The Department also has active technical assistance programs aimed at reducing manufacturing energy intensity by 25% over ten years by engaging a diverse set of industry partners in effective business models, continuous improvement in energy efficiency, modeling key processes, and supporting standards and certifications for third-party services. One example is the 24 existing Industrial Assessment Centers (IACs), situated at universities with major engineering programs, which conduct energy efficiency, productivity improvement, and waste reduction assessments for small- and medium-sized manufacturer at no cost to them. DOE technical assistance also supports the achievement of the national goal set by President Obama of developing 40 gigawatts

of new, cost-effective industrial CHP by 2020. And, DOE provides tools to support improvements in a number of common systems in manufacturing facilities, including motor, steam, compressed air, and pumping systems.

In FY2016, DOE has requested \$404,000,000 for the Advanced Manufacturing Office.

#### ***Weatherization and Intergovernmental Programs***

For decades, states have demonstrated leadership through their unique authorities to develop and implement energy efficiency and renewable energy policies and programs. State governments wield considerable influence in the building sector through upgraded building codes and incentives; in the utility sector through energy efficiency and renewable energy targets and customer programs; and in the industrial sector with policies that encourage energy efficiency through activities such as energy audits and combined heat and power.

EERE's Office of Weatherization and Intergovernmental Programs (WIP) partners with its national network of state and local organizations to significantly accelerate the deployment of energy efficiency and renewable energy technologies and practices by a wide range of government, community, and business stakeholders.

Key recent WIP accomplishments include:

- **Provided critical funding for states to weatherize homes.** In FY 2014 alone, EERE helped improve the energy performance and comfort in the homes of 37,831 American low-income families across the Nation, resulting in an estimated 1.1 trillion Btu of first-year energy savings and \$16 million in first-year energy cost savings.
- **Maintained strict certification and auditing requirements to protect taxpayers.** In FY2014, WAP implemented national certifications and work specifications for residential retrofit worker training, energy audits and weatherization methods.

Included within the Office of Weatherization and Intergovernmental Programs are the Weatherization Assistance Program (WAP) and the State Energy Program (SEP).

The Weatherization Assistance Program provides funding through formula grants to increase the energy efficiency of dwellings owned or occupied by low-income persons, reduce their total residential energy expenditures, and improve their health and safety. Through retrofitting residential buildings, WAP activities reduce the cost of low-income household energy bills, which are significantly disproportionately higher relative to higher income households. Up to 40 million low-income households in the U.S. are eligible for low-income housing energy

assistance. In FY2014, the Weatherization Assistance Program funding weatherized approximately 38,000 homes, exceeding its fiscal year goal of 24,600 homes retrofits for low income families by approximately 50 percent. The Weatherization Assistance Program also provides training and technical assistance to improve program effectiveness, service deliver, resource accountability, and operation efficiency. Specifically, training and technical assistance funding supports the development and implementation of a variety of tools needed to implement work quality, training accreditation, and worker certification.

The State Energy Program assists states through competitive and formula funding in establishing and implementing energy efficiency and renewable energy plans, policies, and programs to reduce energy costs, increase competitiveness, enhance economic competitiveness, improve emergency planning, and improve the environment. States have purview over many of the policy and program levers that can catalyze greater investment in clean energy and help the country realize the suite of economic and environmental benefits associated with clean energy. The State Energy Program provides states with capacity building resources, technical assistance, and best practice sharing networks to facilitate the adoption of plans, policies, and programs that are appropriate based on state and regional circumstances.

In addition, the Local Energy Program, proposed as part of the Department's FY2016 Budget Request, is a new program that will provide support to local governments for energy planning, program development and implementation, analysis, and other related efforts through technical assistance and competitively awarded grants. Local energy efficiency policies, implemented at this scale, in a municipality, county or metropolitan area will lower energy costs, reduce greenhouse gas emissions, and support economic development goals. The objective of the Local Energy Program is to serve as a catalyst for developing creative and effective solutions through projects that improve local energy code implementation; expansion of energy upgrades in commercial buildings and residential buildings, upgrades to the energy efficiency of their own public facilities and operations; development of sustainable funding and financing resources.

In FY2016, DOE has requested \$318,499,000 for the Office of Weatherization and Intergovernmental Programs.

### ***Federal Energy Management***

The U.S. Federal government is the Nation's single largest user of energy and has both a tremendous opportunity and an acknowledged responsibility to lead by example in saving energy. Since 1975, the Federal Government has reduced its energy intensity by 46.2 percent, and 20.6 percent from 2003. Federal GHG emissions have also dropped 17.2 percent since 2008. Additionally, the Federal Government is credited with using 9.2 percent of its electricity from

renewable sources. Federal Agencies have also made progress on a number of other fronts, like reducing water use by 19 percent since 2007<sup>7</sup>.

A number of energy efficiency goals for the federal government were recently extended through 2025 by Executive Order 13693<sup>8</sup> signed in March 2015. It set goals to cut the Federal Government's greenhouse gas (GHG) emissions by 40 percent below 2008 levels by 2025 – saving tax payers up to \$18 billion in avoided energy costs – and increase the share of electricity the Federal Government consumes from renewable sources to 30 percent. The new E.O. builds off of the strong progress the federal government has already made.

DOE plays a critical role in providing technical assistance to Federal agencies to increase understanding and accelerate cost-effective adoption of energy-saving technologies and strategies. DOE's Federal Energy Management Program (FEMP) has developed strategic programs to identify high impact opportunities with public-private sector partnerships as well as technical approaches to address critical barriers across the Federal Government.

FEMP activities contribute to reducing the energy intensity at Federal facilities, lowering their energy bills, and providing environmental benefits through:

- Interagency coordination to align interagency efforts surrounding Federal energy management planning and legislation compliance;
- Training federal agency managers about the latest energy requirements, best practices, and technologies;
- Reporting/tracking tools that provide centralized reporting, data collection, and strategic communication;
- Financial resources and technical assistance to increase Federal agencies' investments in energy efficiency, water conservation, and renewable energy; and
- Data Center Assistance to help agencies develop and implement data center efficiency projects through technical assistance, tools, and training that increase adaptation of measurement protocols, reporting mechanisms, and best practices.

Key recent FEMP accomplishments include:

- **Federal Energy Efficiency Fund.** The First Federal Energy Efficiency Fund Solicitation in FY 2014 was awarded \$5 million to 9 projects worth a total investment of \$120 million

<sup>7</sup> White House Fact Sheet: Reducing Greenhouse Gas Emissions in the Federal Government and Across the Supply Chain. <https://www.whitehouse.gov/the-press-office/2015/03/19/fact-sheet-reducing-greenhouse-gas-emissions-federal-government-and-acro>

<sup>8</sup> Executive Order 13693 is accessible at <https://www.whitehouse.gov/the-press-office/2015/03/19/executive-order-planning-federal-sustainability-next-decade>.

in renewable energy and combined heat and power projects (a 24:1 leveraging ratio). Many of the projects are first-time projects for particular agencies, offering the potential of more in the future. The effort also brought forward a broad set of projects through which FEMP can provide other assistance to federal agencies.

- **New Better Buildings Challenge and Accelerator for Data Centers.** FEMP spearheaded a new Better Buildings Challenge and Accelerator for Data Centers announced in fall 2014, in coordination with EERE's Building Technologies Office. This Challenge has engaged federal agencies, national laboratories, and the private sector, including eBay and Staples, in efforts to greatly improve data center efficiency. Data center energy consumption is significant nationally and across the federal sector, and it can be reduced 20%–40% by applying best management energy efficiency measures and strategies typically with short returns on investment.

In December 2011, President Obama signed a Presidential Memorandum directing the Federal government to enter into a minimum of \$2 billion in performance-based contracts over the next two years for Federal building energy efficiency. In May of 2014, the president announced the expansion and extension of the President's Performance Contracting Challenge (PPCC) to \$4 billion by 2016. In FY 2016, DOE's Federal Energy Management Program will continue to support the PPCC by assisting agencies to successfully meet the \$4 billion goal, and helping agencies to continue their acceleration of using performance contracts to meet future energy investment needs and goals. FEMP will also share and rely on best practices from the PPCC to partner with other government and private sector stakeholders/partners to accelerate their use of performance contracts. As of March 15th, 2015, federal agencies have developed a pipeline of about \$4.74 billion in projects, which exceeds the \$3.97 billion commitment. Agencies are working with FEMP and to date have awarded a total of 199 projects with an investment value of \$2.01 billion and an estimate pipeline of \$2.7 billion.

In FY2016, DOE has requested \$43,088,000 for the Federal Energy Management Program.

### **Conclusion**

Through R&D, deployment, and collaborations at all levels of government and the private sector, the Department of Energy aims to capitalize on the opportunities that energy efficiency affords. The Department's efforts to lead in next-generation buildings and advanced manufacturing will result in a more secure, resilient, and competitive energy economy. While we are making progress, continued efforts are necessary to capture the full set of opportunities.

The Administration looks forward to continuing to work with the Congress on bipartisan legislation to support energy efficiency and boost U.S. competitiveness and job creation. From

partnering with companies and businesses to reduce their energy bills through the Better Buildings Initiative, to Federal administrative actions to cut energy use across Federal facilities, the Department is committed to winning the future by catalyzing a homegrown, clean energy economy in the United States.

Thank you again for the opportunity to speak to this important issue, and I would be happy to answer any questions.

The CHAIRMAN. Thank you, Dr. Hogan. Know that we will be turning to you and your team as we work through the issues, not only on these 22 different bills, but other matters in the efficiency realm. We look forward to working with you.

Let's next go to Mr. Tony Crasi. Welcome to the Committee. Good morning.

**STATEMENT OF TONY CRASI, ON BEHALF OF THE NATIONAL ASSOCIATION OF HOME BUILDERS, AND OWNER AND FOUNDER, THE CRASI COMPANY, INC.**

Mr. CRASI. Thank you.

Chairman Murkowski, Ranking Member Cantwell and members of the Committee, I am pleased to appear before you today on behalf of the 140,000 members of the National Association of Home Builders and to share our views on the Energy Savings and Industrial Competitiveness Act of 2015, S. 720.

My name is Tony Crasi. I am the founder and owner of Crasi Company, and I have been designing and building custom homes in the Akron, Ohio area for the past 31 years.

I also serve on the board of the Urban Neighborhood Development Corporation, a nonprofit organization which seeks to improve the availability of new homes for moderate and middle income families in urban areas.

As a long time leader in a drive to make new and existing homes more energy efficient while prioritizing housing affordability, NAHB is uniquely positioned to analyze the impact of legislation on the home building, remodeling and rental housing industries. NAHB supports many of the goals of the Energy Savings and Industrial Competitiveness Act of 2015 and seeks to ensure that it encourages meaningful energy savings for residential construction and that are achievable and cost effective. To that end, NAHB has four specific recommendations for S. 720 or any comprehensive energy package.

First, the Department of Energy can be an effective participant in the development of modern building energy codes which established the minimum standards for energy efficiency by providing technical assistance such as needed building science, research and energy modeling and analysis.

NAHB is concerned that DOE has crossed the line into advocacy. S. 720 improves this process by setting home—setting some of the guidelines by which DOE operates in this context and requiring DOE to publish energy saving targets and supporting analysis in the Federal Register. This will go a long way towards increasing transparency and ensuring that the public is heard.

NAHB believes that traditional safeguards are necessary to prevent DOE from advocating for specific products or technologies.

Next consumers deserve a reasonable return on their investment when it comes to required energy efficiency improvements. The 2012 residential code added thousands of dollars in construction costs. For every one thousand dollars increase in price of a home, 246,000 households will be priced out of a mortgage. Failure to consider the true economic cost of energy use reductions and establish a reasonable feedback period for these investments will result in fewer families being able to achieve the American Dream.

S. 720 improves the cost effectiveness of this code by requiring DOE to take into account economic considerations. NAHB specifically supports energy codes that have a ten year payback or less. Incentive programs such as the SAVE Act encourage homeowners to invest in energy efficiency and should be included in any final energy package.

Originally introduced by Senators Isakson and Bennet, this is a voluntary program that will improve the accuracy of mortgage underwriting and appraisals by ensuring that they reflect the savings and operating costs in green homes.

Finally, NAHB would like to see S. 1029 which addresses a flawed DOE rule on non-weatherized gas furnaces included in any final legislation. This legislation introduced by Senators Hoeven and Alexander would require DOE to convene a representative advisory group of interested stakeholders to help analyze the impacts of the proposed rule and determine whether it is technically feasible and economically justified and if not, participate in a negotiated rulemaking.

This legislation is needed because the rule would eliminate the availability of non-condensing furnaces. Replacing these with condensing furnaces would require remodeling to reroute the exhaust system costing hundreds, if not thousands of dollars. This may be impossible in some multifamily structures.

Additionally, DOE used a national nationwide cost benefit analysis to justify this rule which neglects a significantly lower energy savings that would be achieved in the south.

NAHB would like to thank Chairman Murkowski, Ranking Member Cantwell and specifically, Senator Portman and Shaheen, for being welcomed as a key stakeholder in the energy efficiency policy discussions for the opportunity to continue to work on this important legislation.

Thank you, and I would invite any questions.

[The prepared statement of Mr. Crasi follows:]



**Testimony of Tony Crasi**

**On Behalf of the  
National Association of Home Builders**

**Before the**

**Senate Committee on Energy and Natural Resources**

***"Hearing on Energy Efficiency Legislation"***

**April 30, 2015**

Testimony of Tony Crasi  
Founder and Owner, The Crasi Company  
On behalf of the National Association of Home Builders  
Page 2

### **Introduction**

Chairman Murkowski, Ranking Member Cantwell and members of the Committee, I am pleased to appear before you today on behalf of the 140,000 members of the National Association of Home Builders (NAHB) and to share our views on the *Energy Savings and Industrial Competitiveness Act of 2015* (S. 720). My name is Tony Crasi. I am the founder and owner of The Crasi Company, and I have been designing and building custom homes in the Akron, Ohio area for the past 31 years. I also serve on the board of the Urban Neighborhood Development Corporation, a non-profit organization which seeks to improve the availability of new homes for moderate and middle-income families in urban areas.

Thank you for welcoming NAHB to this important policy discussion. As a longtime leader in the drive to make new and existing homes more energy efficient while prioritizing housing affordability, NAHB is uniquely positioned to analyze the impact of the legislation on the home building, remodeling and rental housing industries. NAHB supports many of the goals of *The Energy Savings and Industrial Competitiveness Act of 2015* and seeks to ensure that it encourages meaningful energy savings for residential construction that are achievable and cost-effective. To that end, NAHB has four specific recommendations for S.720, or any comprehensive energy bill.

First, the Department of Energy (DOE) can be an effective participant in the development of model energy codes by providing technical assistance to analyze energy savings. Section 101 improves this process by increasing transparency within DOE, but additional safeguards are necessary to prevent DOE from advocating for specific products or technologies and seeking requirements that are not proven to be cost-effective.

Next, consumers deserve a reasonable return on their investment when it comes to required energy efficiency improvements. Failure to consider the true economic costs of energy-use reductions and establish a reasonable payback period for these investments will result in fewer families being able to achieve the American Dream.

Incentive programs such as the *SAVE Act* (Section 433) encourage home owners to invest in energy efficiency by ensuring that mortgage underwriting and appraisals accurately account for savings in operating costs, and this should be included in any final energy package.

Finally, NAHB would like to see S. 1029, which addresses a flawed DOE rule on non-weatherized gas furnaces, included in any final legislation.

NAHB would like to thank Chairman Murkowski, Ranking Member Cantwell, Senator Portman and Senator Shaheen for being welcomed as a key stakeholder in energy efficiency policy discussions and for the opportunity to continue to work on this important legislation.

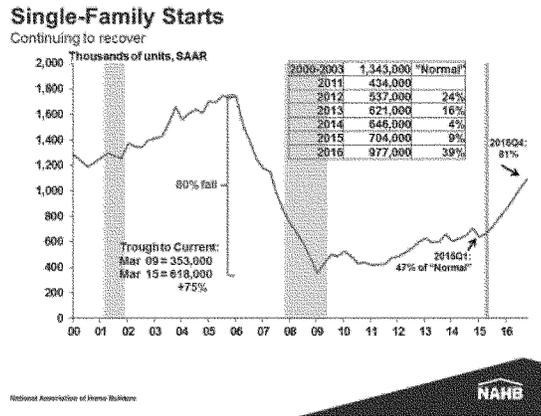
### **Housing Industry Background**

NAHB's members build approximately 80 percent of all new housing in America each year. Collectively, we employ millions of people and generate 17% of our nation's gross domestic product.

The housing industry is just starting to come out of the worst economic downturn since the Great Depression. In order to meet the housing needs of a growing population and replacement requirements

Testimony of Tony Crasi  
 Founder and Owner, The Crasi Company  
 On behalf of the National Association of Home Builders  
 Page 3

of older housing stock, the industry should be building 1.4 million new single-family homes each year. But in 2014, home builders constructed only 648,000 single family homes. That said, the industry is improving and builder confidence is on the rise.



**Energy in the Residential Sector**

One of the bright spots in the housing sector is the growing demand for energy-efficient homes. New homes are considerably more efficient than older homes, and consumers want energy-efficient windows, doors and mechanical equipment.

According to the Energy Information Administration, homes built after 1999 consume only 2% more energy on average than homes built prior to 2000, even though these homes are, on average, 30% larger. In fact, heating and cooling no longer account for the majority of energy use in a home.<sup>1</sup>

These gains are due to energy efficiency improvements in new construction. Homes built from 2000-2009 account for only 3.2% of the total energy consumption in the country, while older homes account for 19%. Because new homes are already so efficient, any significant reduction in overall energy use can only be achieved by addressing the existing building stock and occupant behavior.

<sup>1</sup> U.S. Energy Information Administration, Residential Energy Consumption Survey

Testimony of Tony Crasi  
Founder and Owner, The Crasi Company  
On behalf of the National Association of Home Builders  
Page 4

The existing building stock comprises over 95 million rental and owner-occupied homes that were built before 1991, when modern energy codes were first established. And 80% of the buildings that exist today will still be in use in 2050.

But building retrofits can be very expensive. NAHB believes that incentive programs are an important tool to reduce the barriers of high initial costs and encourage more home owners to invest in energy efficiency. Tax incentives see the fastest results and are the most effective at advancing energy efficiency improvements. Sections 25C for qualified improvements in existing homes (building components), 45L for new homes and 179D for commercial buildings have permeated the market and assisted many families and building owners invest in efficiency. NAHB estimates that for every \$100,000 spent on remodeling, 1.11 full-time equivalent jobs are created. The remodeling activity generated by the 25C tax credit in 2009 was associated with over 278,000 full-time jobs. Unfortunately because these tax incentives keep expiring and being retroactively renewed, the positive impact of these incentives have decreased since 2011.

Occupant behavior is also a growing factor in energy consumption. Electricity use (not including space heating and cooling) accounts for over 70% of energy use, irrespective of when a home was built. The energy-use impact of items purchased by occupants after a home is built can be twice as large as the impact of items typically installed by a builder like windows and insulation. Leaving the television on, doing laundry, running the dishwasher, and even working from home can all drastically increase energy use in a home. Congress should examine education programs and other policies aimed at encouraging consumers to use energy more wisely. One example is the budget-neutral Tenant Star program, which Congress just sent to the President's desk and recognizes tenants who decrease their energy use.

#### **NAHB Green**

NAHB is leading the way to improve energy efficiency in the residential sector for new and existing homes. NAHB launched the development of a green building standard for residential buildings now known as the ICC 700 National Green Building Standard (NGBS). The NGBS is an affordable yet rigorous standard that applies to all types of residential buildings, from single-family homes to multifamily buildings of all sizes, retrofits and land development. It focuses on energy efficiency, water conservation, resource conservation, indoor environmental quality, site design and home owner education and is the basis of a national certification program administered by the Home Innovation Research Labs. This rigorous certification requires buildings to improve in every category to achieve a higher certification level. The NGBS is also the first and only residential green building standard approved by the American National Standards Institute (ANSI), which guarantees that the NGBS was developed using a true consensus process.

NAHB is also working to educate builders on new green design and construction practices through webinars, in-person courses offered during the International Builders' Show and at our state and local home builder associations and two professional designations. Earning the Certified Green Professional (CGP) and the Master Certified Green Professional (Master CGP) credentials requires continuing education green building science and methods and a commitment to incorporate green building principles into homes.

#### **The Energy Savings and Industrial Competitiveness Act of 2015 (S. 720)**

Testimony of Tony Crasi  
Founder and Owner, The Crasi Company  
On behalf of the National Association of Home Builders  
Page 5

These sections detail the provisions in S. 720 that directly impact the housing industry.

#### **Section 101 – Greater Energy Efficiency in Building Codes**

Model building energy codes such as the International Energy Conservation Code (IECC) are used across the country to establish minimum standards for building energy efficiency. The codes are developed by private entities, updated every three years, and are adopted by state and local governments. Once adopted by a state or locality, the code becomes a baseline requirement for all buildings in that jurisdiction.

#### ***Department of Energy Technical Assistance***

While it does not write or publish the codes, the Department of Energy (DOE) participates in the development of model building energy codes by providing technical assistance—needed building science research, energy modeling and analysis that only DOE can provide. But NAHB has concerns that “technical assistance” has been broadly interpreted to allow representatives from DOE to advocate for or against certain technologies, picking winners and losers and seeking aggressive and costly requirements.

Some businesses have realized that by inserting specific products into the code, they can require the use of their products and increase their profits. Instead of allowing the builder to make decisions in the interest of the buyer, the energy codes dictate specific construction methods and which products to use. In addition, DOE has attempted to hire individuals or a firm to provide advocacy assistance. While this has since halted, it is an example of inappropriate advocacy on the part of DOE.

For example, in the 2012 IECC, DOE proposed to prescriptively require foam sheathing, a specific type of insulation. This proposal eliminated the ability to use more cost-effective construction materials and methods. Conversely, DOE did not support an NAHB proposal that would have increased flexibility by allowing builders to trade off efficiency measures—wall insulation, for example—provided they install more efficient mechanical equipment.

Section 101 of S. 720 makes some key improvements in the development of model building energy codes by requiring DOE to publish energy savings targets and supporting analysis in the Federal Register and setting some of the guidelines by which DOE operates in this context. This will go a long way towards increasing transparency and ensuring that the public is heard. NAHB would like to see this legislation include additional safeguards to prevent DOE from crossing the line into “advocacy” and ensure a more cost-effective residential building code.

#### ***Cost-effectiveness***

Another unfortunate trend in energy codes is the failure to consider true economic costs when seeking further energy use reductions. I am a licensed energy rating professional; I know how to build green homes. I know how valuable the energy savings are to the consumer, but even with these savings, there is a significant, upfront investment.

Meeting an energy code is a requirement for every single home, including low-income housing and homes for first-time home buyers. Increasing housing costs for all home buyers will have the unintended consequence of reducing housing affordability. For every \$1,000 increase in the price of a

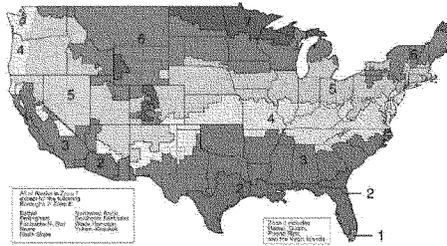
Testimony of Tony Crasi  
 Founder and Owner, The Crasi Company  
 On behalf of the National Association of Home Builders  
 Page 6

home, 246,000 households will be priced out of mortgage eligibility for a 30-year, fixed-rate mortgage with a 5% interest rate.

According to an NAHB market report, *What Home Buyers Really Want*, buyers are willing to pay for lower utility costs, but need a 14 percent return, which corresponds to a 7-year payback. Budget-conscious first time home buyers require a 5-year payback period (attached). The 2012 version of the IECC had such significant cost increases that it would take the average family 13.3 years just to break even. Some climate zones saw payback periods in excess of 16 or 17 years (see graphic below). The average home owner does not stay in their home for this long and will never realize a return on their investment. DOE typically analyzes cost-effectiveness over the life of the building, which they define as 30 years. Some energy efficiency advocates argue that the code should reflect a 30-year payback period, but this is simply not realistic.

Table 8: 2012 IECC Cost Effectiveness Relative to 2009 IECC

Climate Zone	Annual Energy Savings	Incremental Construction Cost	Simple Payback (yrs)
1	\$206	\$3,224	15.7
2	\$294	\$3,330	11.3
3	\$470	\$7,203	15.3
4	\$410	\$7,091	17.3
5	\$505	\$4,653	9.2
6	\$397	\$6,399	16.1
7	\$609	\$6,465	10.6
8	\$725	\$6,465	8.9
<b>National Weighted Average</b>	<b>\$427</b>	<b>\$5,668</b>	<b>13.3</b>



2012 IECC Cost Effectiveness Analysis - <http://www.homeinnovation.com/~media/Files/Reports/Percent%20Energy%20Savings%202012%20IECC%20Cost%20Effectiveness%20Analysis.PDF>

The commercial building sector requires an even shorter return on investment in order to bring the cost in line with commercial leasing structures (10 years or less). Many lenders require strict return on investment analyses. A Turner Construction Report, "2012 Green Building Market Barometer," indicated that 65% of commercial developers expect a payback period of 5 years or less (attached).

A DOE report prepared by the Pacific Northwest National Laboratory, *Assessing U.S. ESCO Industry Performance and Market Trends: Results from the NAESCO Database Project*, found that, in the context of Energy Service Companies (ESCOs), while institutional buildings can withstand a 7-year payback period for energy efficiency improvements, private, commercial buildings can only withstand a 3-year payback (attached). DOE's own report acknowledges that a return on investment is critical for any investments in energy efficiency.

Testimony of Tony Crasi  
 Founder and Owner, The Crasi Company  
 On behalf of the National Association of Home Builders  
 Page 7

With an aging infrastructure and building stock, more American families are going to be relegated to living and working in less-efficient homes and buildings.<sup>2</sup> As the housing market begins to recover, home buyers will be facing dramatically different mortgage qualification requirements and financing issues than before the downturn. The reality is that the oldest, least-efficient homes are the most affordable to families with low to moderate incomes. Unfortunately, these families also bear the largest burden in energy costs as a percentage of income.<sup>3</sup> Home energy use comprises about 17% of total housing costs, and about 9% of the total income for families that earn less than the national median household income. NAHB believes that any mandated energy efficiency measure should have a simple payback period of 10 years or less.

#### **Section 433 – Enhanced Energy Efficiency Underwriting (SAVE Act)**

The availability of green homes, both new and remodeled, has resulted in meaningful utility bill savings for many families. Energy efficient homes are also safer investments. A study conducted by the University of North Carolina – Center for Community Capital, and funded by the Institute for Market Transformation, found that energy efficient homes have lower default risks – on average 32 percent lower, even when accounting for loan determinants.

One of the major barriers for builders choosing to invest in green construction is that appraisers unfamiliar with green construction often neglect to include the true value of this investment in their valuations. As a result, “green” homes, which can cost the consumer less money in utility bills and long-term operations/maintenance costs, do not always reflect the increase in construction costs or value of these future savings. Unfortunately this has turned some builders away from this market.

That is why NAHB supports inclusion of the *SAVE Act* in any final energy package. Originally introduced by Senators Johnny Isakson and Michael Bennet and included in S. 720, this legislation provides guidance to the Department of Housing and Urban Development (HUD) to update underwriting and appraisal guidelines to ensure they more accurately reflect the economic benefits of green features.

Further, home owners or home buyers would be able to voluntarily obtain an energy efficiency report and supply that to a lender for use in certain mortgage calculations. Utility savings could be factored into the debt-to-income qualifying ratio, which tests a borrower’s ability to make monthly payments, and the present value of expected energy savings could be included in the loan-to-value ratio. In some parts of the country, utility bills can be higher than the interest or taxes paid on the mortgage, yet they are not currently factored into these calculations.

The *SAVE Act* is a voluntary program that will not only ensure more accuracy in mortgage underwriting and appraisals, but will have a transformative effect in encouraging energy efficiency across the residential sector. NAHB strongly supports its inclusion in the final energy package.

#### **DOE Proposed Rule on Furnace Efficiency**

<sup>2</sup> The average age of an owner-occupied home in the U.S. is now 35 years and climbing. See the following NAHB analysis for more detail (“An Aging Housing Stock,” Eye on Housing blog,

<http://eyeonhousing.org/2014/01/20/the-aging-housing-stock/>)

<sup>3</sup> CES, 2010

Testimony of Tony Crasi  
Founder and Owner, The Crasi Company  
On behalf of the National Association of Home Builders  
Page 8

While not included in S. 720, legislation has been introduced by Senators John Hoeven and Lamar Alexander (S. 1029) that addresses the recently proposed DOE rule for residential non-weatherized gas furnaces and mobile home furnaces. This legislation would require DOE to convene a representative advisory group of interested stakeholders to help analyze the impacts of the proposed rule and determine whether it is technically feasible and economically justified, and if not, participate in a negotiated rulemaking.

This is needed because the rule, as proposed, is not cost-effective in the southern U.S. Homes in the warmer southern climate use much less heat throughout the year. Unfortunately, DOE used a nationwide cost-benefit analysis to determine whether this rule is economically justified, and this neglects the low energy savings that would be achieved in the south.

Additionally, this rule would eliminate the availability of non-condensing furnaces, which can complicate the replacement of these furnaces in existing homes across the country. Replacing a non-condensing furnace with a condensing furnace will require remodeling to re-route the exhaust system, and this could potentially cost homeowners hundreds, if not thousands, of dollars. This type of retrofit may also be impossible or even illegal in some existing town homes and multifamily structures. Replacing a furnace after a break would also take significantly more time and money. For these reasons, NAHB believes that S. 1029 will help DOE better understand market realities and hopefully result in a more effective rule. NAHB urges the committee to consider this legislation and support its inclusion in the final energy package.

**Conclusion**

NAHB wants to work as a partner with all levels of government to encourage energy efficiency, however, we must also make sure that any mandates are cost-effective and do not jeopardize housing affordability. NAHB looks forward to working with the committee to improve and ultimately advance this important legislation. Thank you once again for this opportunity.

**Chapter 10**

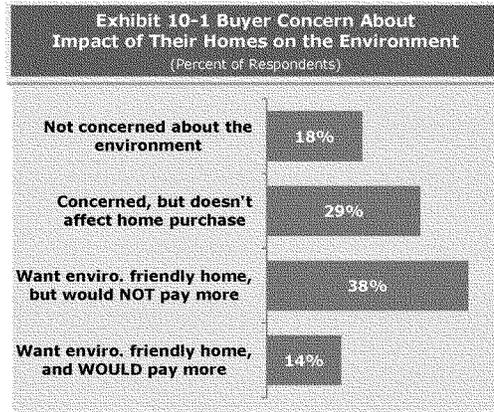
**Impact on the Environment, Utility Costs & Energy Efficiency**

Builders, architects, and product manufacturers, among other housing industry professionals, often want to know if home buyers are concerned about the impact of building their home on the environment, and if so, what is the level of their concern. The answers have important, practical implications on how a home is built and what products and materials are used in its construction.

Questions about the environment can be asked in several forms. The 2012 NAHB survey asked buyers about their general attitude toward the environment and how it impacts their purchase decision, how important low utility costs are and have been to them, how much they would be willing to pay up-front for lower utility costs in the future, and, finally, how desirable they find particular environment-friendly amenities.

**Concern About the Environment Doesn't Mean Home Can Cost More**

As Exhibit 10-1 shows, although the majority of home buyers are concerned about the environment in general, most are not willing to pay more for a “greener” house. In fact, 38 percent of home buyers report wanting an environment friendly home, but would not pay more for it. Another 29 percent are concerned about the environment, but don't take this into consideration when buying a home. On either side are relatively small shares of buyers at the extremes: 18 percent who are not at all concerned about the impact of building their home on the environment and 14 percent who are not only concerned but would actually pay more for the house to reduce its impact on the environment. Home buyers have rather similar attitudes about the environment irrespective of their age,



geography or race.

However, more buyers—24 percent—expecting to pay at least \$500,000 would be willing to spend more for a home that is environmentally friendly. Appendix A shows a detailed demographic breakdown of the question on environmental concern, beginning on page A-34.

History shows that there has been a noticeable shift away from taking environmental impacts into account when buying a home. In 2004, 36 percent of buyers said either that they

	2004	2007	2012
Not concerned about the environment	10	13	18
Concerned about the environment, but not a consideration in house purchase	26	24	29
Want environment friendly home, but would NOT pay more	48	45	38
WOULD pay more for environment friendly home	16	17	14

were not concerned at all about the environment, or that it was not a consideration in their choice of a home. By 2012, this share had increased from 36 to 47 percent (Exhibit 10-2).

**Buyers Do Want to Know the Home’s Projected Utility Costs**

Demand for energy saving features can be driven not only by general concern about the environment, but also by a desire to achieve lower ongoing utility costs. The “What Home Buyers Really Want” survey included a question that asked buyers the extent to which they agreed with three statements about utility costs on a

scale of 1 to 5, where 1 is “strongly disagree” and 5 is “strongly agree.”

A little over three-quarters of buyers agree to strongly agree (rating it 4 or 5) with the general statement that “knowing the projected utility costs of a home is very important (Exhibit 10-3). Only 5 percent rate this statement as low as a 1 or 2 (Appendix A-40).

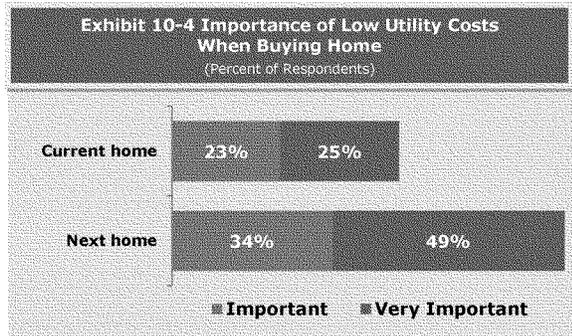
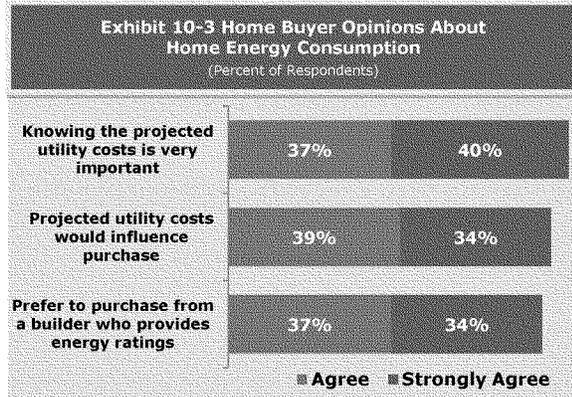
For nearly as many buyers, projected utility costs are important enough to influence their purchase decision (73 percent agreeing with the statement enough to rate it a 4 or 5). Just over 70 percent of buyers agree or strongly agree that they would prefer to purchase a home from a

builder who provides energy ratings. (The question explained that a home energy rating gauges the energy efficiency of a home much like a miles-per-gallon reading measures gas efficiency for a car.)

Buyers of different ages, geographic areas, income, and racial groups all provided rather similar responses to this multi-part question (Appendix A, pages A37-A42).

The survey also investigated if attitudes toward utility costs have changed since the last time owners bought a home, asking them to rate how important low utility costs *were* at the time they bought their current home, and *will be* when they buy their next one. Again, the rating was done on a scale of 1 to 5. In this question, 1 was defined as “not at all important” and 5 as “very important.”

The results show that home buyers attach much more importance to having low utility costs in their next home than



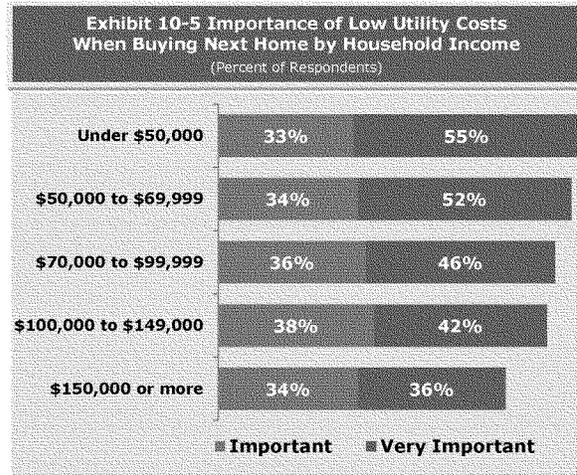
they did when choosing their current one. More than 8 out of 10 buyers (83 percent) rate having low utility costs in their next home important to very important (i.e., a rating of 4 or 5), compared to only 48 percent who consider low utility costs this important when buying their current home (Exhibit 10-4). On average, home buyers rate the importance of low utility costs when choosing their current home a 3.4, while for their next home the average rating is 4.3.

There are significant differences in how much importance buyers attach to low utility bills, depending on their income level. Among buyers who earn less than \$50,000 a year, 88 percent rate low utility costs a 4 or 5 on the importance scale when buying their next home, with 55 percent giving it the maximum rating of 5. The very important share declines steadily as income rises, however, to 36 percent among those earning \$150,000 or more (Exhibit 10-5).

More breakdowns on the importance of low utility costs to various types of buyers are shown in Appendix A, starting on page A-37.

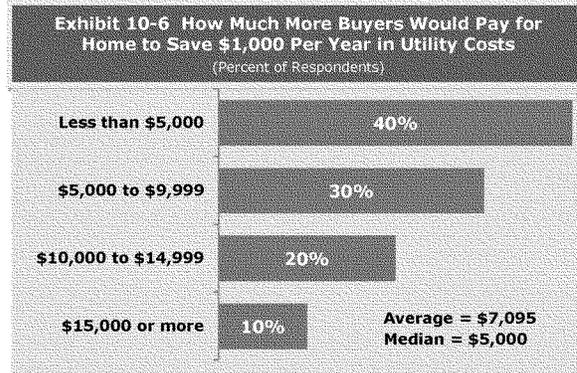
**Buyers Will Pay More for Lower Utility Costs, but Want a 14 Percent Return**

So far in this chapter, we've seen that most buyers are quite concerned about the cost of utilities in the homes they intend to purchase—often to the point of agreeing that they prefer to buy from a builder providing home energy ratings. In the previous chapter, we've seen that a large majority of buyers



are, in fact, willing to pay more for a home to achieve an unspecified reduction in utility bills over the life of the home (Exhibit 9-6).

This still leaves the question of how much more buyers will pay up front in the cost of the home to achieve a specific dollar reduction in annual utility bills. For many years, a standard feature of NAHB consumer surveys has been a question on how much extra buyers would pay up



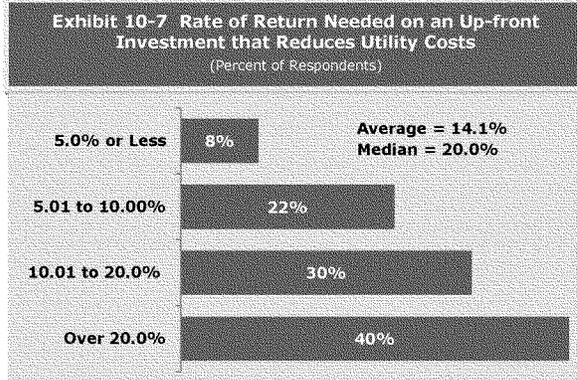
front, in the purchase price of their next home, if it would save \$1,000 every year in utility costs. That question was included again in the 2012 survey.

Answers show that, in 2012, 40 percent of buyers would pay less than \$5,000 extra for a home to save \$1,000 per year in utility bills, 30 percent would pay between \$5,000 and \$9,999, and another 30 percent would pay \$10,000 or more (Exhibit 10-6).

On average, home buyers would pay an average of \$7,095, and a median of \$5,000, to save \$1,000 annually in utility costs. On the survey, this is phrased as an open ended question that allows buyers to write in any dollar amount they want. Although some write in specific numbers with a perhaps odd looking combination of digits (e.g., \$4,762), there is a tendency to answer in round numbers. Over a quarter of respondents wrote in \$5,000 and nearly 20 percent wrote in \$10,000. The relatively high share writing in \$5,000 tends to make the median stable (unlikely to vary much across subgroups in the population) at that level.

Some buyers said they were willing to pay a lot to achieve a \$1,000 reduction in utility bills, all the way up to \$100,000 more for the home (a few cases where buyers said they were willing to pay more than that were deleted as unrealistic, possibly signaling respondent error in counting the number of zeros in their answers). Buyers like these pull the average of \$7,095 above the median of \$5,000.

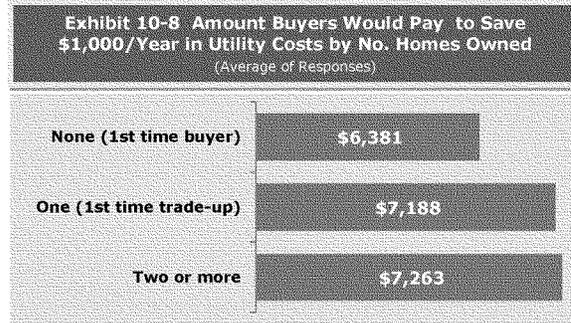
Some may find it more convenient to flip the question and answer around and evaluate the information in terms of a rate of return on the



upfront investment. If a buyer is willing to pay less than \$5,000 up front to save \$1,000 per year, it means the buyer needs a return of over 20 percent on the investment. The average rate of return buyers need on an investment in energy efficiency (or something else that reduces utility bills) is 14.1 percent, and the median is 20 percent (Exhibit 10-7).

**First-time, Lower-income Buyers Will Pay Less to Reduce Utility Costs**

The survey results also show that first-time home buyers are willing to spend less up front for lower utility bills. Buyers who have never owned a home before are willing to pay

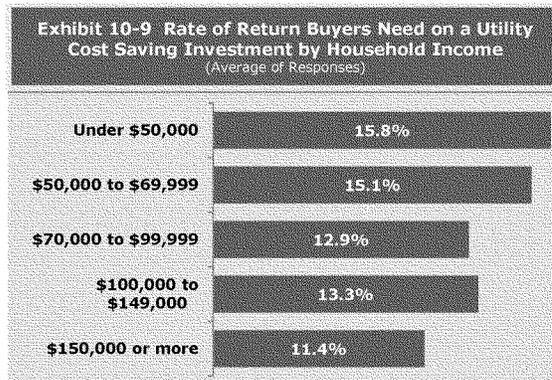


\$6,381 on average for a \$1,000 per year reduction in utility bills, compared to over \$7,000 for those who have owned a home before (Exhibit 10-8). This result is not surprising, given that first-time buyers lack equity in a previously owned home that they can use for a down payment, and tend to have a more difficult time qualifying for a mortgage, making the up-front increase in cost difficult to withstand.

Homes buyers with lower incomes are also likely to have a more difficult time qualifying for a mortgage, and consequently a lower tolerance for higher up-front costs. This shows up in a higher rate of return needed on an investment that will save \$1,000 a year in future utility costs. Buyers earning less than \$70,000 a year need over 15 percent on average; buyers with incomes in the range of \$70,000 to \$149,999 range need about 13 percent; and buyers with incomes of at least \$150,000 need 11.4 percent (Exhibit 10-9).

The Appendix contains additional breakdowns on pages A-34 to A-36. The average amount buyers are willing to pay up front to save \$1,000 in annual utility costs is under \$10,000 for every Division, age or income bracket, household type, house price, generation, or racial/ethnic category considered in the appendix—with the single exception of buyers expecting to pay half a million dollars or more for the home, who are willing to pay an average of \$10,343. The median is exactly \$5,000 for every one of these groups, except for the West South Central Census Division, where it is \$4,000.

Between 2004 and 2007, the average amount buyers were willing to pay up front for energy efficiency (or



other utility cost reducing measures) increased from just over \$7,000 to almost \$9,000, but this trend reversed itself in 2012 (Exhibit 10-10). Generally, the only group willing to accept less than a 10 percent return on an energy efficiency

**Exhibit 10-10 How Much Buyers Are Willing to Pay for Reduced Utility Costs – History**  
(Average of Responses)

	2004	2007	2012
<b>A. Price they'd pay up front to save \$1,000 per year (\$)</b>			
<b>All buyers</b>	<b>7,073</b>	<b>8,964</b>	<b>7,095</b>
First-time buyers	6,588	10,081	6,381
First-time move-up buyers	6,935	9,506	7,188
2nd-time+ move-up buyers	7,304	8,308	7,263
<b>By price buyers expect to pay for the home:</b>			
Less than \$150,000	5,925	8,274	6,423
\$150,000 to \$249,999	7,234	7,234	6,171
\$250,000 to \$499,999	7,877	9,964	8,036
\$500,000 or more	7,742	11,477	10,343
<b>B. Annual return needed on the up-front investment (%)</b>			
<b>All buyers</b>	<b>14.1</b>	<b>11.2</b>	<b>14.1</b>
First-time buyers	15.2	9.9	15.7
First-time move-up buyers	14.4	10.5	13.9
2nd-time+ move-up buyers	13.7	12.0	13.8
<b>By price buyers expect to pay for the home:</b>			
Less than \$150,000	16.9	12.1	15.6
\$150,000 to \$249,999	13.8	13.8	16.2
\$250,000 to \$499,999	12.7	10.0	12.4
\$500,000 or more	12.9	8.7	9.7

investment is the one expecting to pay \$500,000 or more for a home. In 2007, first-time buyers were willing to invest in energy efficiency for a return of just under 10 percent, but this appears to be an anomaly and was not confirmed by more recent data.

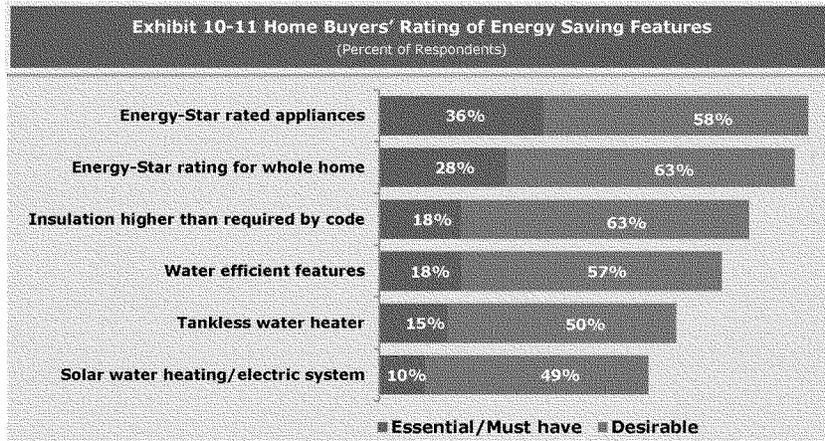
**Home Buyers Give Energy-Star High Marks, Especially for Appliances**

So far, we've seen that most buyers want an energy efficient home, and on average would pay an additional \$7,100 up front if it would save them \$1,000 a year in utility costs. In other words, buyers want energy efficiency, but apply a fairly stringent cost-effectiveness requirement when deciding on specific energy efficiency investments. A related question is what specific characteristics home buyers believe will tend to deliver energy efficiency in this cost-effective fashion.

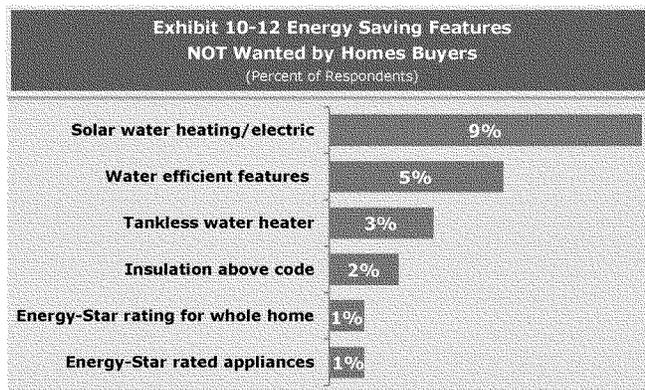
To investigate this, the survey asked home buyers to rate six energy-saving or green features on a scale of essential, desirable, indifferent, or "do not want." As first described back in Chapter 3, essential means the buyer is

unlikely to buy a home without feature; desirable implies buyer would be seriously influenced to buy because feature is included; indifferent means feature would not influence purchase decision; and "do not want" means the buyer is not likely to buy a home if it has this particular feature.

Energy-Star rated appliances came in at the top of the list (Exhibit 10-11). A full 94 percent of home buyers said that Energy-star appliances are at least desirable, and of these 36 percent consider them essential. Next on buyers' wish list is an energy-star rating for the whole home, with 91 percent rating it as desirable or essential. All energy-saving features on the list are rated as desirable or better by well over half of buyers. Insulation higher than required by code is rated this highly by 81 percent of buyers, followed by water-efficient features (75 percent), a tankless water heater (65 percent), and a solar water heating/electric system (59 percent). There are no significant preference differences for these features among buyers of different ages, incomes, or any of the other variables shown in Appendix A (pages A-88 to A-90).



As noted in earlier chapters, it is important for builders to know about features that buyers say will prevent them from purchasing a home. When it comes to energy saving features, however, few buyers show this level of antipathy. Fewer than 10 percent of buyers are willing to say they will expressly reject a home simply because it has one of the green or energy-saving features in the survey. At the extreme, 9 percent say they do not want a home with a solar water heating/electric system. For the other five energy saving features, the “do not want” percentages are even smaller than this (Exhibit 10-12).



In conclusion, to summarize a few of the more important points in this chapter:

- In 2012, only 14 percent of home buyers are willing to pay more for a home out of pure concern for the environment
- However, a large majority of buyers think low utility costs are important and are willing to pay more up front to achieve lower utility costs in the future.
- To persuade them to make these utility cost saving investments, most buyers require a substantial rate of return—an average of 14 percent and a median of 20 percent across all buyers, the same in 2012 as it was in 2004.
- Home buyers with lower incomes are more likely to say low utility costs are important, but are willing to pay less up front to achieve the ongoing, annual savings.
- Among specific energy saving features, buyers see Energy-star ratings as highly desirable, especially for appliances.

**Assessing U.S. ESCO Industry Performance and Market Trends:  
Results from the NAESCO Database Project**

*Julie Osborn, Lawrence Berkeley National Laboratory  
Chuck Goldman, Lawrence Berkeley National Laboratory  
Nicole Hopper, Lawrence Berkeley National Laboratory  
Terry Singer, National Association of Energy Service Companies*

**ABSTRACT**

The U.S. Energy Services Company (ESCO) industry is often cited as the most successful model for the private sector delivery of energy-efficiency services. This study documents actual performance of the ESCO industry in order to provide policymakers and investors with objective information and customers with a resource for benchmarking proposed projects relative to industry performance. We have assembled a database of nearly 1500 case studies of energy-efficiency projects – the most comprehensive data set of the U.S. ESCO industry available. These projects include \$2.55B of work completed by 51 ESCOs and span much of the history of this industry.

We estimate that the ESCO industry completed \$1.8-2.1B of projects in 2000. The industry has grown rapidly over the last decade with revenues increasing at a 24% annualized rate. We compare typical project characteristics, energy savings, and economics in institutional and private sector market segments. ESCOs typically invested about \$2.30/ft<sup>2</sup> per project in various energy efficiency improvements, although there is large variation in project costs across market segments. We find that lighting-only projects report median electricity savings of 47% of targeted equipment consumption; the median for lighting-&-non-lighting projects is 23% of the total electric bill baseline. Median simple payback time is seven years for institutional sector projects and three years in the private sector. We estimate direct economic benefits of \$1.62 billion for the 1080 projects in our database with both cost and savings data. The median benefit/cost ratio is 2.1 for 309 private sector projects and 1.6 for 771 institutional sector projects. Finally, we discuss the role of enabling legislation and policies, including ratepayer-funded energy-efficiency programs, in encouraging ESCO industry growth.

**Introduction**

A large private sector energy-efficiency services industry has developed in North America over the last 20 years whose primary business is performance contracting. Today, over sixty national and regional Energy Services Companies (ESCOs) are actively operating in the U.S. Utilizing savings from investments in high-efficiency equipment, these companies work to provide solutions to customer needs, including facility and equipment modernization, reduced utility expenses, reliable power and improved control over facility operation and comfort.

The U.S. ESCO industry has attracted the interest of federal, state, and international policymakers interested in promoting successful models for energy efficiency. Although much has been written about the U.S. ESCO industry, few studies have relied on key

underlying empirical data – the track record of ESCOs in developing projects – in order to assess trends in ESCO market activity over time as well as actual project performance and economics from the customer’s perspective. This project, a collaborative effort of the National Association of Energy Service Companies (NAESCO), an industry trade association, and Lawrence Berkeley National Laboratory (LBNL) attempts to fill that gap by developing a large database of projects completed by ESCOs.

This database of ~1500 projects represents an investment of \$2.55B by 51 companies. Preliminary results from the LBNL/NAESCO database were first reported in Goldman et al (2000). The database has nearly doubled in size since that initial study. We have analyzed this more extensive project data and conducted a survey of active ESCOs in order to develop a comprehensive, historical “snapshot” of the ESCO industry (Goldman et al 2002). This report includes more detailed information than the initial publication on project characteristics, costs, and energy savings, as well as an analysis of project economics from the customer’s perspective and estimates of historic and current ESCO industry market activity. Overall goals of the project are to provide objective information on ESCO market and industry trends and to analyze the impact of enabling policies that facilitate broad customer access to energy-efficiency services from private sector providers.

### **Approach**

Most project information was provided by ESCOs as part of NAESCO’s voluntary accreditation process. State agencies that administer performance-contracting programs in the institutional market also submitted ~275 projects for our database. Our sample includes projects completed in 45 states between 1982 and 2001 by ESCOs for whom performance contracting is a core part of their business, although the database is not limited to performance-contracting projects. We reviewed project data and worked with individual ESCOs and state agencies to ensure data quality and accuracy. Project information provided by ESCOs has been verified through a peer review process and customer reference checks of a subset of projects. We also estimated aggregate industry size by interviewing ESCOs and industry experts to determine the portion of the industry represented by our sample.

Our database is not necessarily representative of the entire energy-efficiency services industry because of our data collection process and because ESCOs self-select projects to submit. ESCOs that want to be accredited by NAESCO submit an application every 2-3 years, which includes information on up to 50 energy-efficiency projects completed in the preceding 42-month period. The extent to which these projects represent the ESCO’s total business varies with the size of the company. For smaller ESCOs, the database typically includes all of their performance-based projects, while for larger ESCOs, the database includes a self-selected sample. Note that not all of the 1500 projects in the database have complete information in all data fields, so where appropriate we indicate sample sizes when reporting analysis results.

### **Aggregate ESCO Industry Activity**

Several previous studies have characterized the market for energy efficiency or energy services and estimated industry activity or market potential. Different sampling methods and definitions of industry scope have been used, with dramatically different results

(Cudahy and Dreessen 1996; Easton Management Consultants and Feldman 1999; Frost & Sullivan 1997). In estimating aggregate ESCO industry activity, we decided to focus on energy-efficiency and other value-added services and have excluded revenues from electric or gas commodity procurement. We collected information on market activity of 63 companies that have national or regional operations in the energy-efficiency services industry. Companies that do not offer performance contracting were excluded from our survey, although ESCOs did not have to offer performance-contracting services exclusively. We used various methods to collect this information, including interviews with NAESCO member companies (N=20) and financial information on individual ESCOs from state agency program RFQs (N=17). We also surveyed several industry experts through a modified delphi approach in order to develop high and low estimates of historic and current market activity of 26 other companies that were identified as ESCOs.

#### **Industry Revenues Reached ~\$2Billion/year in 2000**

Figure 1 shows our low and high estimates of ESCO industry activity between 1990 and 2000. We estimate that ESCO market activity for various energy-efficiency related services ranges between \$1.8B and \$2.1B in 2000. The industry has experienced rapid growth during the last decade with aggregate revenues increasing at a 24% annualized rate. Growth has slowed since 1996, with 9% annualized revenue growth over the period 1996-2000. Factors that may explain slower growth rates include the relative maturity and saturation of performance contracting in the institutional market, the upheaval and uncertainties created by electricity restructuring and retail competition in various states, reduced spending on ratepayer-funded energy-efficiency programs, and competition from new entrants such as retail energy service companies. We estimate that 13 companies with annual revenues over \$30 million (M) account for ~75% of total industry activity.

In our high estimate, performance contracting as a fraction of these 63 companies' total activity has dropped from 74% (1995 and earlier) to 57% (1996-2000). The size of the performance-contracting market ranges between \$0.9B and \$1.2B in 2000. These results suggest that performance contracting may not be the primary source of future growth for the ESCO industry, but rather that revenue growth may hinge on successful development of energy-efficiency related value-added services that build on ESCO core competencies.

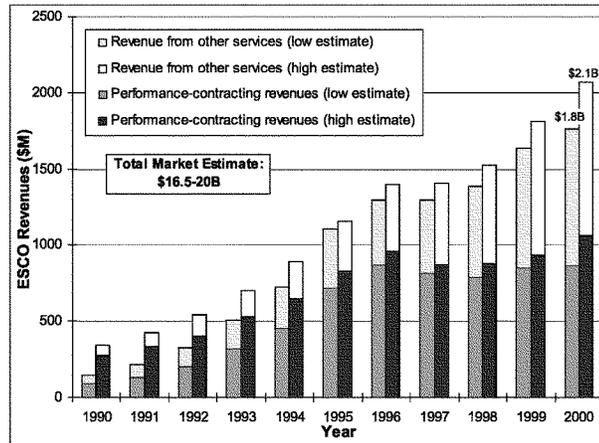
We believe that the \$2.55B in investment represented by the ~1500 projects in our database represents about 15% of total ESCO industry activity during the 1990-2000 period. From 1990 to 1995, our database projects represent about \$400M (11%) of the \$3.0-4.1B total cumulative ESCO industry investment during this time period. From 1996-2000, the \$1.6B of project investment in the database represents about 19% of the \$7.9-8.7B invested in ESCO projects during that period.

#### **Typical Project Characteristics**

ESCOs are active in almost all states, although this activity is concentrated in areas with high population and economic activity, and states with attractive performance-contracting legislation, supporting policies or public benefits funding for energy efficiency (Kushler & Witte 2001). In our sample, four states (New York, New Jersey, California and Texas) account for 44% of market activity. Figure 2 shows the range of project costs for

1420 projects representing an aggregate investment of ~\$2.55B. Projects completed since 1996 account for about two-thirds of reported costs. This skew reflects both our intensified data collection efforts and the growth of the ESCO industry in recent years. Median and average project costs are \$0.7M and \$1.8M respectively over the entire sample, although projects vary tremendously in size. The range in project investment is quite large, even among projects in the same market segment.

**Figure 1. Estimated Market Activity of U.S. ESCO Industry**

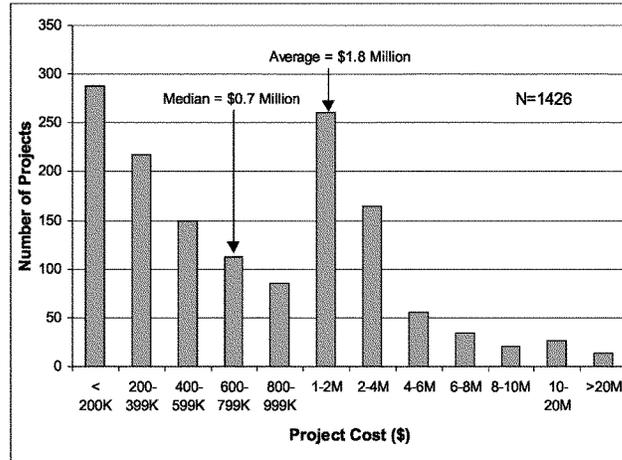


#### ESCOs Focus on Institutional Sector Customers

ESCOs classified their projects using market segment categories that we created (see **Table 1**). In much of our analysis, we examine trends between institutional and private sectors, rather than individual market segments. We find that this distinction impacts project performance and economics because of differences in customer motivation, access to capital, and planning time horizons.

Approximately 73% of the projects in our database are from the institutional sector. The total share of private sector projects represented in the database dropped from 33% before 1996 to 25% from 1996 on. We believe that the institutional market share in our database represents an upper bound on ESCO activity in this market for two reasons. First, ESCOs are more reluctant to divulge information on private sector projects. Second, our sample also includes ~275 projects that were provided voluntarily by eight state agencies that administer performance-contracting programs.

**Figure 2. Range in ESCO Project Costs**



**Table 1. Market Segments in Institutional and Private Sectors**

Institutional Sector	Private Sector
K-12 schools	Hotels/hospitality
State/local government	Office, commercial
University/colleges	Retail
Federal government	Industrial
Health/hospitals	Residential
Public housing	Other

**Multiple Measures, Multiple End Uses**

Projects typically install multiple measures or retrofits that target several end uses. Individual energy conservation measures were aggregated into 11 broader “measure categories” for analysis purposes. Penetration rates of measure categories for database projects are: lighting measures (82%), comfort conditioning (68%), motors/drives (23%), water heaters (8%), power supply (6%), refrigeration (2%), miscellaneous equipment/systems (3%), industrial process improvements (3%), other measures/strategies (21%), plumbing products & fittings (10%), and non-energy improvements (3%)<sup>1</sup>. Comfort conditioning measures are more popular in institutional projects than in private sector

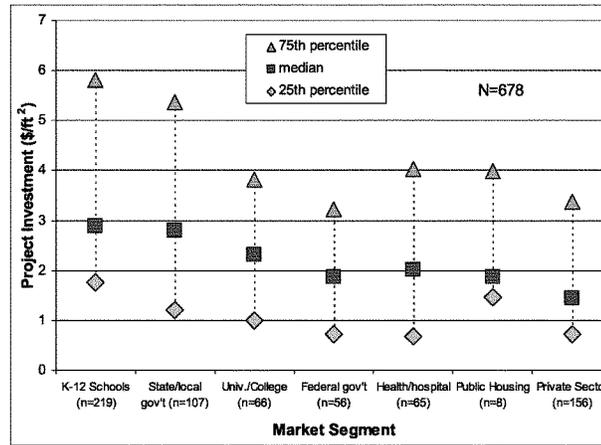
<sup>1</sup> ESCOs reported installing non-energy improvements almost exclusively in the institutional sector, often in K-12 Schools. Roof replacement/repair was the most common type of non-energy improvement, followed by asbestos abatement and new ceilings.

projects (76% vs. 45%). Our data suggest that institutional sector projects, on average, target a greater number of measure categories than projects for private sector customers.

**Project Investment is Higher in Institutional Markets**

In aggregate, median project investments in the institutional sector are three times higher than in private sector projects (\$0.9M vs. \$0.3M). This relationship holds true when normalized for floor area, as shown in Figure 3. Median project costs/ft<sup>2</sup> are 1.8 times greater in institutional than in private sector projects (\$2.50/ft<sup>2</sup> vs. \$1.40/ft<sup>2</sup>). The difference in the number of retrofit measure categories between market sectors may help to explain this trend. There is large variation in costs among projects in the same sector but for all projects, the median investment is \$2.3/ft<sup>2</sup>.

**Figure 3. Project Cost Normalized by Floor Area**



**Performance-Contracting Market Share Is Decreasing among ESCOs**

Over the last decade, there has been an evolution in the types of contractual agreements utilized by ESCOs and their clients. ESCOs were asked to characterize the type of contract agreement for each project as guaranteed savings, shared savings, pay-from-savings, asset ownership/chauffage, design/build, fee-for-service or fixed price. The share of performance-contracting projects in our sample has decreased significantly since 1996 (from 92% before 1996 to 76% since). This trend likely understates the shift away from performance-contracting arrangements in the energy efficiency services market overall because of our data collection approach and focus. Guaranteed savings contracts and design/build or fee-for-service arrangements are the most common contracting approaches. The 621 projects that employed performance contracting had higher project investment than

the 160 projects that used non-performance contracts (\$1.0M vs. \$0.5M). Of the performance-based contracts in our database, 86% used the guaranteed savings contracting mechanism. Typical duration of contracts in our sample is 10 years, although shorter term contracts (i.e., <5 years) have become increasingly popular since 1995 (~20% of projects during this time period). Contracts lasting more than 15 years accounted for about 10% of projects in the database.

### **Delivered Energy Savings**

We also analyzed typical project energy savings. ESCOs were requested to report baseline consumption as well as predicted and actual (verified) savings in energy and/or dollar terms for each project. Reductions in electricity consumption are critically important to project success, accounting on average for over 80% of total energy savings (on a site energy basis). Median energy savings (electricity and other fuels) are 15 kBTU/ft<sup>2</sup> for the 29% of projects that provided sufficient data to complete this analysis. Median energy savings (electricity and other fuels) are higher for state/local government and health/hospital projects (18-19 kBTU/ft<sup>2</sup>) compared to 13-15 kBTU/ft<sup>2</sup> for K-12 schools, university/college, federal government and private sector projects. Reported project energy savings vary widely. After normalizing for floor area, energy savings typically vary by a factor of 3-5 for the middle 50% of projects within each market segment (inter-quartile range).

### **Percent Electricity Savings**

We grouped projects into three retrofit strategies in analyzing percent savings: lighting-only (LO), lighting-&-non-lighting (LNL), and non-lighting-only (NLO) measures. The baseline metric used to gauge pre-retrofit electricity consumption differs by retrofit strategy. Baseline electricity consumption for LO projects is usually measured for the targeted equipment only; LNL project electricity consumption tends to be measured on a total facility (utility bill) basis.

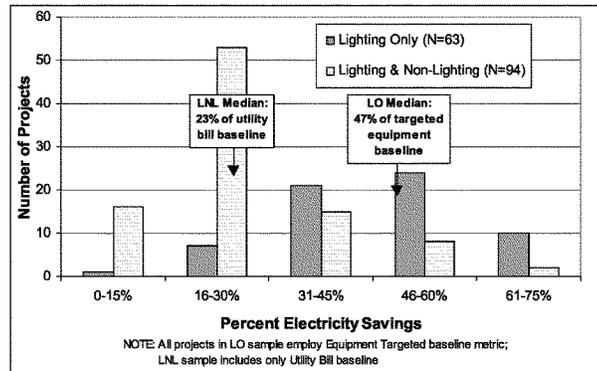
Figure 4 shows the distribution in percent electricity savings for projects using these two retrofit strategies. LO projects report median electricity savings of 47% of the targeted equipment (with inter-quartile range of 37% to 56%). These results suggest that ESCOs are achieving significant reductions in lighting energy consumption. The median electricity savings for the 94 LNL projects is 23% of the total electric bill baseline with an inter-quartile range of 17% to 32%. These results give a sense of the extent to which ESCO projects are impacting total facility electricity usage.

### **Project Economics from the Customer's Perspective**

For each project in the database, we calculated three economic indicators: net benefits, benefit/cost (B/C) ratio, and simple payback time (SPT). We chose to define economic benefits conservatively and included only the direct value of reduced expenditures on energy and other financial savings, such as operations and maintenance (O&M). ESCO projects may also yield a number of indirect or less tangible benefits such as increased productivity, replacement of aging equipment, improved amenity and comfort levels, and environmental improvements. For many customers, these benefits are as important and

valuable as cost savings from direct energy-related expenditures. Because it is difficult to assign a dollar value to indirect benefits, our analysis focused only on the dollar value of the direct economic benefits of ESCO projects. Thus our approach is likely to underestimate the actual value of these projects to customers.

**Figure 4. Electricity Savings by Retrofit Strategy**



Based on customer market research and discussions with ESCOs, institutional sector customers typically have longer planning horizons, can access third party financing at attractive interest rates, and issue solicitations for performance contracts that allow for relatively long economic payback times (e.g., 10-25 years). In contrast, in evaluating energy-efficiency project proposals, private sector customers often have high investment hurdle rates (which translate into shorter payback periods), shorter planning horizons (e.g., due to leased space), and often face higher interest rates for third party financing (e.g., due to risk of plant shutdown, business risks). To reflect these differences, we used lower nominal discount rates in our economic analysis of institutional sector projects (7% with 10% sensitivity analysis) than for private sector projects (10% and 15%).

#### Project Net Benefits

For the 1080 projects with both cost and savings data (73% of the database), net direct economic benefits are ~\$1.62B, using 7% and 10% nominal discount rates respectively for institutional and private sector projects (see Tables 2 and 3). Net benefits for the entire sample decrease to \$874M at the higher discount rates of 10% and 15% respectively. About 90% of the gross benefits come from energy savings, with the remaining 10% attributed to non-energy (e.g., O&M) savings.

### Cost-Effectiveness of ESCO Projects

We found that 87% of the 309 private sector projects and 70% of the 771 institutional sector projects have B/C ratios greater than one. The B/C ratio is 1.6 for institutional sector projects using a 7% discount rate and 1.3 using a 10% discount rate (see Table 1). For private sector projects, the median B/C ratio ranges between 2.1 and 1.6, depending on the choice of discount rates (see Table 2). We believe that these results may understate the value of projects to customers, because we have not accounted for indirect benefits and have used conservative assumptions (i.e., discount rates).

**Table 2. Institutional Sector Project Economics: Benefit/Cost Analysis**

Market Segment	N	Total Project Costs (\$M)	7% Discount Rate					10% Discount Rate				
			Direct Economic Benefits (\$M)		Benefit/Cost Ratio			Direct Economic Benefits (\$M)		Benefit/Cost Ratio		
			Gross	Net	25 val	median	75 val	Gross	Net	25 val	median	75 val
K-12 schools	289	714	803	88	0.7	1.0	1.7	633	-81	0.5	0.8	1.3
State/ local gov't	159	276	581	305	1.0	1.7	3.0	471	195	0.9	1.4	2.4
Univ./ colleges	100	301	809	508	1.2	1.7	3.1	637	336	0.9	1.4	2.4
Federal gov't	58	153	280	126	0.9	1.7	3.2	225	72	0.8	1.4	2.6
Health/ hospital	134	136	365	229	1.6	2.3	3.8	295	159	1.3	1.9	3.3
Public Housing	31	96	140	45	0.7	1.5	1.8	114	18	0.6	1.2	1.4
Institutional Sector	771	1677	2978	1301	0.9	1.6	2.5	2375	698	0.7	1.3	2.0

**Table 3. Private Sector Project Economics: Benefit/Cost Analysis**

Market Segment	N	Total Project Costs (\$M)	10% Discount Rate					15% Discount Rate				
			Direct Economic Benefits (\$M)		Benefit/Cost Ratio			Direct Economic Benefits (\$M)		Benefit/Cost Ratio		
			Gross	Net	25 val	median	75 val	Gross	Net	25 val	median	75 val
Commercial*	192	137	349	212	1.7	2.2	3.7	265	128	1.3	1.7	2.8
Industrial	76	95	181	86	1.3	1.8	2.7	136	41	1.0	1.4	2.2
Other**	41	28	47	18	0.8	1.8	2.7	34	6	0.7	1.3	2.0
Private sector	309	260	576	317	1.4	2.1	3.2	435	176	1.1	1.6	2.6

\*includes hotels/hospitality, retail space, and commercial offices.

\*\*includes residential and projects that were classified as "other" by the ESCO.

### Simple Payback Time (SPT)

We calculated SPT for each project by dividing project costs by savings<sup>2</sup>. Savings were determined by multiplying average annual energy savings by the appropriate price for that energy source (e.g., electricity, gas) in the year the project was completed. If actual energy savings were not available, we used the dollar value of savings as reported by the ESCO. The median SPT is about seven years for the 788 projects in the institutional sector (see Figure 5). Approximately 44% of institutional sector projects have a SPT of six years or less. Within the institutional market, median payback times are shorter (4 years) in the 139 health/hospital and 159 state/local government projects compared to the 296 K-12 schools projects with a median payback time of 10 years. In contrast, median SPT is about three years for the 319 private sector projects; about 83% of these projects have a SPT of six years or less.

<sup>2</sup> For projects that received a rebate, we subtracted 100% of the incentive from project cost; for other REEP programs, we subtracted 50% of the reported incentives from project cost; other projects were unaffected.

Our analysis suggests that project economics are also influenced by choice of retrofit strategy and state or federal performance-contracting guidelines (e.g., maximum contract terms). We compared SPT in institutional and private sectors for projects grouped by retrofit strategy (see Table 4). First, note the higher share of LO projects in the private sector than the institutional market (43% vs. 20%). Second, median payback times for LO projects are relatively short in both institutional and private sector projects (2 years). Third, median payback times are significantly longer for LNL and NLO projects in the institutional sector than the private sector projects (8 vs. 4 and 2 years). As these retrofit strategy categories are quite broad, it appears that private sector projects selectively focus on individual measures with shorter payback times. This result is not surprising given the typical time horizon for decision-making in the private sector.

Figure 5. Simple Payback Time of Institutional Sector Projects

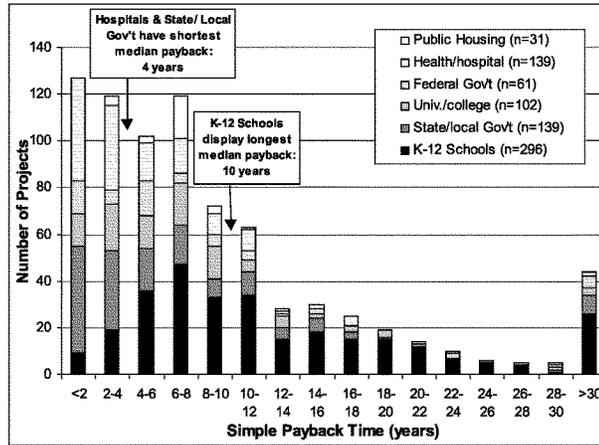


Table 4. Impact of Retrofit Strategy on Simple Payback Time

Retrofit Strategy	Simple Payback Time (years)							
	Institutional Sector				Private Sector			
	N	25 val	median	75 val	N	25 val	median	75 val
Lighting Only	146	1	2	4	128	1	2	4
Lighting & Non-Lighting	498	5	8	13	97	3	4	6
Non-Lighting Only	98	2	8	14	73	1	2	5

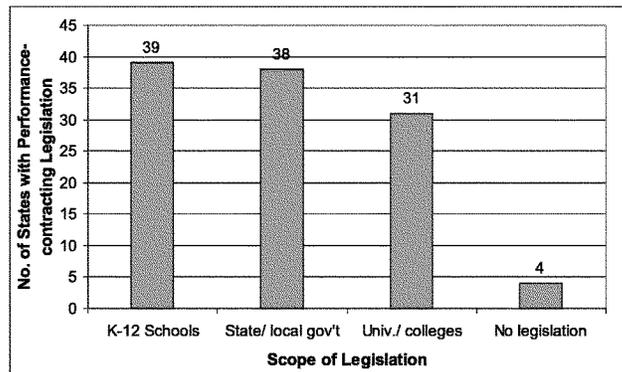
In the institutional market, enabling legislation and program guidelines influence project economics and the types of measures installed in projects. For example, many states specify the maximum contract term for performance contracts in their enabling legislation. The underlying intent of these provisions is to articulate the state’s willingness to undertake comprehensive projects that install and finance high-efficiency equipment and other

measures up to a cost-effectiveness threshold. More than two-thirds of U.S. states (34) allow maximum contract terms of 10 or more years. Thus it is not surprising that energy-efficiency equipment and measures that are installed in institutional sector projects have long expected economic lifetimes and SPTs.

### The Role of Enabling Policies and Programs

Policies and programs supported by state or federal legislatures and public utility commissions (e.g., energy efficiency programs) have played an important role in stimulating ESCO activity in various markets. In a survey of state legislation, we found that most states allow or encourage performance-contracting projects in various public institutional markets: K-12 schools, state/local governments, and university/colleges (Figure 6). Only four states have no such legislation in any of these market segments.

**Figure 6. Most States Promote Performance Contracting with Legislation**



### Drivers of Performance Contracting in Institutional Markets

Our sample of institutional sector projects suggests that the amount of performance-contracting activity in K-12 school, university/colleges, and state/local government market segments is affected by a state's overall potential market size, favorable enabling legislation and procurement rules for performance contracting, and active support from state energy program offices. Table 5 shows the 10 states with the highest levels of ESCO institutional project investment in our database. We ranked each state in terms of their economic activity (gross state product), state energy office activity,<sup>3</sup> number of institutional sectors targeted by

<sup>3</sup> We surveyed several industry experts and asked them to categorize the activity level of state energy offices or the office responsible for administering performance-contracting programs in the institutional market. Activity level was ranked on a scale of 1 to 3 (3 = high activity and 1 = low activity).

enabling legislation, and overall performance contracting promotional rating based on a simple metric developed by LBNL.<sup>4</sup>

Eight of the top 10 states in terms of ESCO institutional project investment also ranked in the top 10 for economic activity. This result underscores the reality that ESCOs tend to be most active in states with large markets. Favorable performance-contracting legislation may have the most impact in states with medium to smaller size institutional markets that might not otherwise attract ESCO interest (e.g., Indiana). For example, Kentucky, Missouri and Washington have enabling legislation that covers all three institutional markets and these states report high numbers of projects in our database, with total project costs that place them in the second activity tier (rank 11-20). Ohio is the only state in the top 10 with enabling legislation in only one market segment (K-12 schools). Other enabling policies such as REEPs may also play a role. For example, four of the top five states in terms of ESCO institutional project investment had REEPs that were particularly attractive to ESCOs (e.g., SPC programs in New York, New Jersey, California and Texas).

**Table 5. State ESCO Promotion and Activity Ranking**

State	ESCO Project Costs (SC, UC & GO) <sup>1</sup>			Economic Activity (1999 GSP)*		State Energy Office Activity	Number of Sectors with Legislation	LBNL Overall Rating*** of State Support for Perf. Contracting
	Rank <sup>†</sup>	(\$M)	N	Rank <sup>†</sup>	(\$B)	1=low, 2=medium, 3=high**		
New York	1	287	76	2	755	2.3	3	7
California	2	147	81	1	1229	1.0	3	3
Texas	3	131	40	3	687	2.0	3	6
Indiana	4	112	23	15	182	1.0	3	3
New Jersey	5	84	95	8	332	2.0	3	6
Illinois	6	75	38	4	446	2.0	3	6
Ohio	7	68	45	7	362	2.0	1	2
Massachusetts	8	66	27	11	263	1.7	3	5
Florida	9	65	23	5	443	1.0	3	3
Pennsylvania	10	54	37	6	383	2.0	3	6

<sup>1</sup>SC = K-12 schools, UC = university/colleges, GO = state/local gov't

<sup>†</sup>Ranking among the 50 U.S. states; 1=highest, 50=lowest.

Sources:

\* Bureau of Economic Analysis 2001

\*\* Values are averages of responses in a blind survey of several industry experts

\*\*\* Calculated as "State Energy Office Activity" level multiplied by the "Number of Sectors with Legislation"

## Conclusion

This report summarizes industry and market trends in the energy-efficiency services industry based on a bottom-up analysis of ~1500 projects. We have tried to demonstrate the value of compiling and analyzing project-specific information on the ESCO industry using standardized methods in order to provide useful information to policymakers and market actors alike. In undertaking such an effort, we are cognizant of limitations imposed by our

<sup>4</sup> We combined the activity of state energy offices and the number of institutional sectors covered by enabling legislation into a single metric (calculated as "State Energy Office Activity" level multiplied by the "Number of Sectors with Legislation").

data collection methods (e.g., project selection bias), inconsistent ESCO tracking and reporting practices of ESCOs, and uneven quality of project data. We have adopted various quality assurance measures and controls to improve data quality and consistency and reached out to other data sources (e.g., state energy offices) to minimize self-selection bias.

The NAESCO/LBNL database project is an ongoing initiative, which provides a unique information source on industry trends, market activity and business practices of companies involved in energy-efficiency related services. We intend to continue to expand and refine the project database and industry/market analysis reports in order to continue to address evolving information needs of policymakers, market actors, and customers.

### **Acknowledgements**

This work was supported by the Assistant Secretary of Energy Efficiency and Renewable Energy, Office of Power Technologies of the U.S. Department of Energy under Contract No. DE-AC04-94AL85000, and by the Rebuild America Program under the Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy. We would like to thank the following individuals and organizations that contributed valuable information on energy-efficiency projects and ESCO industry activity: Dave Birr, Don Gilligan, Dave Dayton, Steve Morgan, Patti Donahue, NAESCO members and state energy offices.

### **References**

- Bureau of Economic Analysis. 2001. Regional Accounts Data: Gross State Product Data. Available online: <http://www.bea.doc.gov/bea/regional/gsp>. Washington, D.C.
- Cudahy, Richard D. and Thomas K. Dreessen. 1996. A review of the energy service company (ESCO) industry in the United States. NAESCO for the World Bank. March.
- Easton Management Consultants and Shel Feldman. 1999. ESCO Market Research Study. Prepared for Energy Center of Wisconsin and NYSERDA.
- Frost and Sullivan. 1997. North American markets for non-residential energy management services. Frost & Sullivan, California.
- Goldman, C.A., P. Juergens, M. Fowlie, J. Osborn, K. Kawamoto, T. Singer. 2000. Historical Performance of the U.S. ESCO Industry: Results from the NAESCO Project Database. ACEEE. August.
- Goldman, C.A., J.G. Osborn, N.C. Hopper, and T.E. Singer. 2002. Market Trends in the U.S. ESCO Industry: Results from the NAESCO Database Project. LBNL-49601. Berkeley, Ca.: Lawrence Berkeley National Laboratory. May.
- Kushler, M. and P. Witte. 2001. Can We Just "Rely on the Market" to Provide Energy Efficiency? An Examination of the Role of Private Market Actors in an Era of Electric Utility Restructuring. ACEEE. October.

2012 Green Building Market Barometer





## Executive Summary

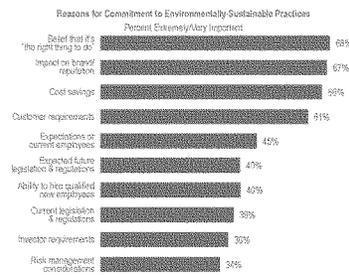
Turner Construction Company's latest Green Building Market Barometer, which surveyed more than 700 executives, found that companies remain committed to constructing environmentally-sustainable buildings. Almost all the executives participating in the 2012 survey said their companies would incorporate at least some Green features in their next construction project, citing the potential to reduce energy costs and ongoing operations and maintenance costs as the most important reasons for constructing Green buildings. While the commitment to constructing Green buildings remains high, fewer executives said their companies were likely to seek LEED certification when constructing a Green building.

### Brightening Outlook for Construction Projects

Among real estate owners, developers, and corporate owner-occupants, 64% said they expect to launch construction projects over the next 12 months (up from 46% in the 2010 survey), and 71% said they expect to undertake renovation projects over the same period (up from 58% in the 2010 survey).

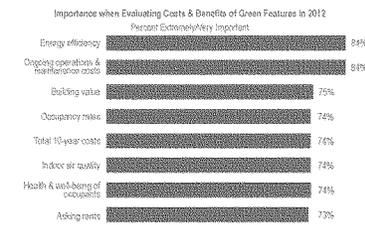
### Widespread Commitment to Sustainable Practices

Fifty-six percent of executives said their companies were extremely or very committed to following environmentally-sustainable practices in their operations, while an additional 34% said they were somewhat committed. In addition to citing financial reasons for this commitment, executives were most likely to cite broader considerations as extremely or very important including belief that it's the "right thing to do," (68%), impact on brand/reputation (67%), and customer requirements (61%), along with cost savings (66%).

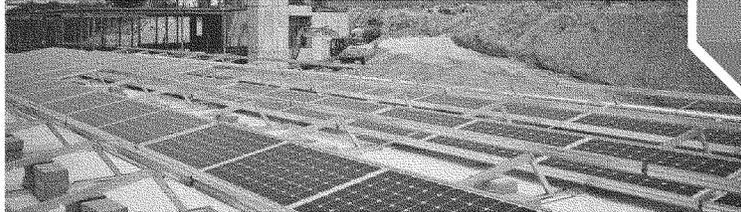


### Reducing Energy Costs and Operating Expenses are the Key Drivers to Green Construction

Executives were most likely to cite financial factors as being extremely or very important to their companies' decisions on whether to incorporate Green features in a construction project: energy efficiency (84%) and ongoing operations and maintenance costs (84%).

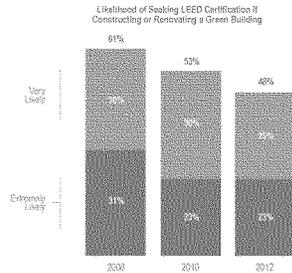


In addition, executives cited that building value (75%) and occupancy rates (74%) were important considerations when evaluating the benefits of incorporating Green features into their building. However, two-thirds or more of executives also said that non-financial factors were extremely or very important such as indoor air quality (74%), health and well-being of occupants (74%), satisfaction of employees/occupants (69%), impact on brand/reputation (67%), and employee productivity (67%). However, only 37% of executives said it was extremely or very important to their companies to minimize the carbon footprint of their buildings. This suggests that the decision to incorporate Green features is driven by a desire to reduce cost followed by an interest to improve the indoor environment for building occupants, rather than broader concerns about the impact of buildings on the global environment.



A large majority of executives said their companies would be extremely or very likely to incorporate Green features if they were undertaking a construction project. Consistent with their focus on reducing costs, 81% of executives said their companies would be extremely or very likely to invest in energy efficiency improvements. Fewer executives, but still more than half, said their companies were extremely or very likely to invest in improved indoor environmental quality (63%), improved water efficiency (57%), or Green materials (53%).

**Fewer Companies Plan to Seek LEED Certification**  
 Although the vast majority of companies remain committed to Green buildings, the percentage of executives who thought it was extremely or very likely that their company would seek LEED (Leadership in Energy and Environmental Design) certification if they constructed a Green building was 48%, down from 53% in the 2010 survey and 61% in the 2008 survey. Among executives who said their companies were not likely to seek LEED certification, the most important reasons cited were the cost of the certification process (82%), staff time required (79%), time required for the process (75%), and the overall perceived difficulty of the process (74%).



In addition, many companies seem to have become more knowledgeable about the means and methods of designing and constructing Green buildings and are less reliant on LEED as a checklist or a scorecard. This is indicated by the fact that 52% of executives who are not likely to seek LEED certification would prefer to use their own company's green building standards. However, of those who would seek LEED certification, 47% would seek Gold or Platinum.

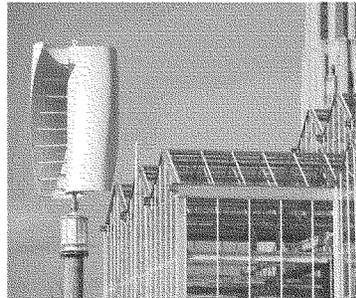
Turner Construction Company 2012 Green Building Market Barometer

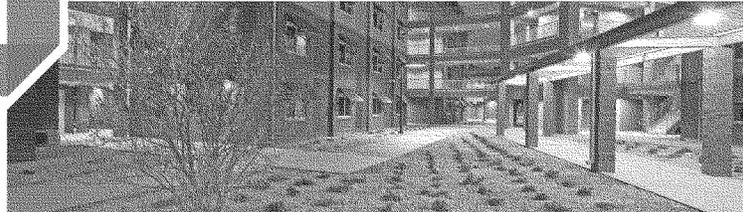


Forty-one percent of all the executives surveyed thought it was at least somewhat likely that their companies would consider seeking certification under a rating system other than LEED if they constructed a Green building. Among these executives, 63% said they would be extremely or very likely to consider seeking certification under ENERGY STAR, which addresses energy efficiency. Roughly 20% of these executives said they were extremely or very likely to consider seeking certification under Green Globes, Living Building Challenge, or BREEAM (Building Research Establishment Environmental Assessment Method).

**Concerns Persist about Construction Costs and the Length of the Payback Period**

When asked what length of payback period would be acceptable when considering Green features, 44% of executives said they would accept five years and almost 80% of executives said they would accept a payback period of five years or longer. Despite the acceptance by most executives of an extended payback period, 61% of executives still felt that the length of the payback period was an extremely or very significant obstacle to the construction of Green buildings while 62% cited higher construction costs.





### Introduction

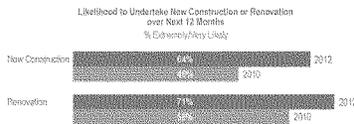
Over the past several years, the Green building market has exploded. In 2005, Green building construction projects had a total value of \$10 billion.<sup>1</sup> A September 2012 McGraw-Hill analysis predicted the total market would reach \$85 billion in 2012.<sup>2</sup> Turner Construction Company, the top Green contractor in the U.S. according to Engineering News Record, generated 53% of its sales revenue from Green projects in 2012, up from just 24% in 2006.

The vast majority of the executives surveyed said they would incorporate Green features if they were undertaking a construction or renovation project. This growth in the Green building market reflects a broader commitment to environmentally-sustainable practices by corporate America. Customers, investors, employees, and the general public increasingly expect companies to following sustainable practices.

The 2012 Market Barometer assesses these continuing trends and examines the factors driving the decision to build Green buildings, the acceptable payback period for investing in Green features, the remaining obstacles to Green construction, and the role of LEED and other Green building rating systems.

### Brightening Outlook for Construction Projects

The 2012 Market Barometer found increasing optimism among real estate executives since the prior survey in 2010. Sixty-four percent of the real estate owners, developers, and corporate owner-occupants surveyed said they expect to undertake new construction projects over the next 12 months (up from 46% in the 2010 survey), and 71% expect to undertake renovation projects over the same period (up from 56% in 2010).



Turner Construction Company 2012 Green Building Market Barometer

This outlook reflects the improving financial position for both corporations and institutions, allowing many to move ahead with projects they had postponed. These results are also consistent with economic data released during the fall of 2012. In September 2012, the U.S. unemployment rate dipped below 8% for the first time in four years, and the economy grew at an annual rate of 2% in the third quarter, beating expectations. Stock values more than doubled from March 2009 to November 2012.<sup>3</sup> And the U.S. Census Bureau reported that in October total nonresidential construction spending was up more than 5% compared to one year earlier.

### Widespread Commitment to Sustainable Practices

Companies continue to report their commitment to environmentally-sustainable practices, not only in real estate, but across their operations. Ninety percent of executives said their companies are committed to following environmentally-sustainable practices in their operations, with 56% percent extremely or very committed, and 33% somewhat committed.

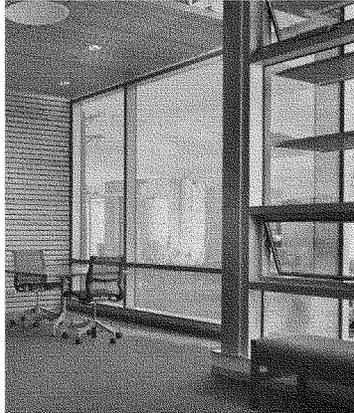
The reasons driving this commitment go far beyond a simple question of cost savings. Although many executives did cite cost savings (66%), the other top reasons were belief that it's the 'right thing to do,' (68%), impact on brand/reputation (67%), and customer requirements (61%). These are broader considerations involving social responsibility and the growing realization that sustainability can provide an important competitive advantage. This is also reflected in the biggest changes from the 2010 survey: a growing number of executives said their companies are committed to environmentally-sustainable practices because of the expectations of current employees (45%, up from 36% in 2010) and the ability to hire qualified new employees (40%, up from 33% in 2010).

The move toward sustainability is becoming central to the way a company views itself and wants to be seen by its employees, customers, investors, and the general public. One recent study by Harvard Business School researchers found companies that are leaders in sustainability "significantly outperform their counterparts over the long-term, both in terms of stock market and accounting performance."<sup>4</sup>



Increasingly, the importance of sustainability extends beyond a company's operations to include the vendors and service providers it chooses to engage. Seventy-five percent of executives said their companies consider the level of sustainable practices when choosing a supplier of goods or materials, with 48% calling it an extremely or very important consideration. The level of sustainable practices is nearly as important when selecting service providers. Seventy-four percent of executives said their companies take it into account, with 42% saying it is an extremely or very important consideration in the selection process.

Among executives at companies where sustainable practices are at least somewhat important when selecting vendors and service providers, the use of Green materials was the factor cited most often as a consideration (87%), followed by amount of waste in operations (78%). Roughly 70% of executives said their companies also consider energy efficiency of operations, Green packaging, water efficiency of operations, and carbon footprint.



Terracon Construction Company 2012 Green Building Market Barometer

## Reducing Energy Costs and Operating Expenses are the Key Drivers to Green Construction

While executives cited broad considerations in their companies' commitment to sustainable practices, they focused more on the bottom line when asked about their decisions to incorporate Green features in a construction or renovation project. Executives said the top two considerations when deciding whether to incorporate Green features are energy efficiency and ongoing operations and maintenance costs. Eighty-four percent of executives said both are extremely or very important factors in evaluating the costs and benefits of Green features. Other financial factors that rank high are: building value (75%), total 10-year costs (74%), and asking rents (73%).

The impact of Green features on a building's occupants also heavily influences decision-making. More than two-thirds of executives said the following factors are extremely or very important: indoor air quality (74%), health and well-being of occupants (74%), satisfaction of employees/occupants (69%), and employee productivity (67%). Researchers are now calculating the bottom line impact of Green buildings on productivity. A study of PNC bank branches by University of Notre Dame management professors Edward Conlon and Ante Glavas found that the LEED-certified branches outperformed their non-certified counterparts by \$461,300 per employee.<sup>5</sup> Employee hiring and retention was an extremely or very important consideration in building Green for almost half of the companies. Another key driver for Green construction is impact on brand/reputation, rated as extremely or very important by 67% of executives. It may be assumed that companies recognize that these factors—health, productivity, and satisfaction of workers, as well as brand identity—have economic benefits as well, although they may be harder to quantify.

Sixty-seven percent of respondents cited water efficiency as a key factor in their decisions. The large gap in the percentage of executives who consider energy efficiency highly important (84%) compared to water efficiency (67%) may be due to the fact that water usage accounts for a smaller percentage of building operating expenses than energy usage. Yet, water efficiency is likely to become a larger consideration as costs rise. Single-family residential water prices in 30 major U.S. cities went up an average of nearly 18% from 2010 to 2012<sup>6</sup> and monthly costs doubled in 29 communities from 2000 to 2012.<sup>7</sup> By 2035, the country's water systems are expected to require as much as



\$1 trillion in infrastructure improvements, which will likely lead to higher rates.<sup>8</sup> There is also growing awareness that water is a finite resource. One study predicts that by 2030 the world's water requirements will exceed current sustainable supplies by 40 percent.<sup>9</sup>

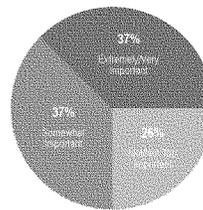
The vast majority of executives said their companies would be extremely or very likely to incorporate Green features if they were constructing a new building or undertaking a renovation. Executives were most likely to say their companies would invest in energy efficiency (81%), consistent with its large economic impact and the importance placed on reducing ongoing costs. Buildings account for 41% of total energy consumption and 73% of electric consumption in the United States.<sup>10</sup> The opportunity to reduce costs through energy efficiency can be significant. For instance, LEED Gold buildings in the General Services Administration's (GSA) portfolio typically consume 25% less energy than the average commercial building.<sup>11</sup> Those GSA LEED Gold buildings also consume 11% less water than the average commercial building.<sup>12</sup> However, once again, saving water was seen as less important than saving energy, with 57% of executives saying that improved water efficiency would be an extremely or very likely investment. Indoor environmental quality (53%) ranked slightly higher, and 53% of executives said they were extremely or very likely to invest in Green materials. Among the executives who said their companies would be extremely or very likely to use Green materials, the top choices were materials with low or no volatile organic compounds (VOCs) (90%) and those that contain recycled content (89%).



Tanner Construction Company 2012 Green Building Market Barometer

Although the majority of executives said they plan to incorporate a number of Green features in their projects, just 37% of executives said minimizing the carbon footprint of their buildings is extremely or very important to their companies. This suggests that the decision to incorporate Green features is more about reducing costs and pleasing occupants through better indoor environmental quality, rather than broader concerns about the impact of buildings on the environment. Evaluating the performance of Green buildings in operation is becoming the norm, with 81% saying they conduct post-occupancy evaluations. More than half of executives said their companies review performance at least once a year, including 26% who said they do so it on an ongoing basis.

Importance of Minimizing Carbon Footprint of Buildings



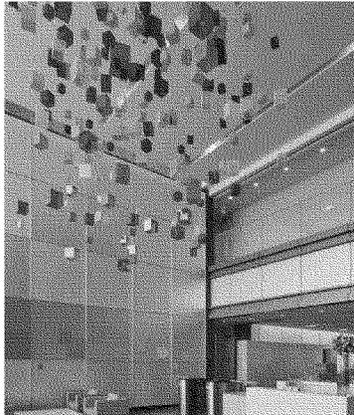
Companies use building evaluations as a way to reduce operating costs and improve performance. The most important reasons reported for conducting evaluations are to monitor operating costs and financial performance (80%) and to improve building performance (75%). Fifty-three percent said evaluations are important to assess the impacts on tenants or employees. Just 40% said the evaluations are important to provide information for company sustainability reports.

Some early critics of LEED cited the fact that it focused on the design and construction of Green buildings but did not address their ongoing operation and maintenance. More recent versions of LEED have addressed this concern by including requirements for post-occupancy evaluation. The next version of LEED will require sub-metering of building systems as a prerequisite for certification.



### Fewer Companies Plan to Seek LEED Certification

LEED has become the leading global standard for measuring building sustainability since its launch in 2000. The U.S. Green Building Council (USGBC) developed the voluntary certification program. LEED-registered building projects are independently verified by the Green Building Certification Institute (GBCI). As of October 2012, more than 13,000 commercial buildings in the U.S. had been certified under LEED, and another 30,000 were pursuing certification.<sup>12</sup> Government agencies have been strong proponents of LEED—from 2000 to 2010, 400 cities, counties, states, and federal agencies across 45 states approved policies requiring LEED standards for their new or renovated buildings.<sup>14</sup> LEED certification is the most widely used third-party verification of Green construction standards. LEED has been widely adopted in all sectors of the real estate market, in every region of the U.S. and increasingly around the world. Today, 50% of the total LEED square footage is outside the U.S.<sup>15</sup>



Turner Construction Company 2012 Green Building Market Barometer

However, while the commitment to incorporating Green features in building projects is widespread, the 2012 Barometer found a continuing decline in the assumption that companies would seek LEED certification for their Green buildings. Only 48% of executives said it is extremely or very likely that their company would seek LEED certification for a Green construction or renovation project. That's down from 54% in the 2010 survey and 61% in the 2008 survey. Cost, time, and the difficulty of the certification process are the leading reasons cited for the declining commitment to LEED. Among executives who said their companies are not likely to seek LEED certification, 82% said the cost of the certification process is an extremely or very important reason. Other highly important reasons are: staff time required (79%), time required for the process (75%), and the perceived difficulty of the process (74%).

*“Cost, time, and the difficulty of the certification process are the leading reasons cited for declining commitment to LEED.”*

LEED certification also appears to be less of a priority for companies that have developed their own building standards. Fifty-two percent of executives at companies not likely to certify under LEED said they would prefer to rely on their company's standards. This indicates that, in the decade since LEED was first introduced, companies have become more knowledgeable about the means and methods of designing and constructing Green buildings. This makes them less reliant on seeking formal LEED certification, although many are still using LEED as a standard to assess the design and performance of their buildings. Today, many projects that forgo formal certification are still requested to be built “to the LEED standard” or that they be “LEED equivalent.”

In addition, building codes today are more likely to include more rigorous environmental standards. For example, California adopted the first mandatory Green building code in the country.<sup>16</sup> Taking effect in January 2011, CalGreen requires all new buildings in the state to conserve water, use interior materials that are less prone to emitting pollutants, and recycle construction waste. It also steps up enforcement of energy efficiency for large non-residential buildings. Other states, including Massachusetts, Florida, and Oregon, have adopted the International Energy Conservation Code (IECC) as part of their state-wide building codes, and Boston has incorporated LEED standards into its building code.



### More Companies Consider Other Ratings Systems

Forty-one percent of the executives surveyed said it is at least somewhat likely that their companies would consider seeking certification under a rating system other than LEED if they constructed a Green building. Among the executives who said they would consider another type of certification, ENERGY STAR was mentioned most often, with 63% saying they would be extremely or very likely to consider seeking certification. ENERGY STAR, a joint program of the U.S. Environmental Protection Agency and the Department of Energy, addresses only energy efficiency and is consistent with LEED. In fact, a minimum ENERGY STAR score of 69 is a prerequisite for any existing building seeking LEED 2009 certification. More than 16,000 U.S. buildings have been certified as ENERGY STAR as of April 2012.<sup>11</sup>

Other types of certifications executives said they would be extremely or very likely to consider include Green Globes (25%), which advertises itself as a "business-friendly and affordable alternative to LEED," and Living Building Challenge (21%), a highly rigorous system that is not intended to compete with LEED certification. Nineteen percent of executives said they would be likely to consider BREEAM (Building Research Establishment Environmental Assessment Method), which has certified 200,000 buildings globally, most of them in the UK.<sup>12</sup>

If companies were to pursue LEED certification, 41% of executives said their preferred designation is Gold, while 38% chose Silver. Only 15% chose the lowest ranking of Certified and just 6% chose the highest ranking of Platinum. One indicator of the generally higher aspirations for Green building projects is that of those who would seek LEED certification almost half (47%) would seek Gold or Platinum, the highest levels.

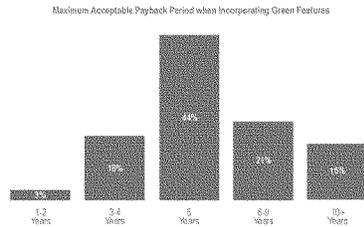
The USGBC plans to revise LEED substantially in 2013, which will make LEED certification even more challenging. The new standards aim to ensure certified buildings use more environmentally-friendly materials and achieve greater energy and water use efficiency. This means builders will have to do more to obtain certification.<sup>13</sup> Revisions were originally scheduled for release in 2012, but many in the industry objected that there were too many significant changes since the standards were last issued in 2009.

Of the executives who said their companies would be at least somewhat likely to seek LEED certification, 65% said strengthens our brand is an extremely or very important reason. More than half (57%) said provides an objective standard of performance is as important factor. This is another indication that LEED is increasingly viewed as a tool to burnish a company's reputation rather than simply a "how to" guide for Green construction.

### Concerns Persist about Construction Costs and the Length of the Payback Period

A major theme of the 2012 Green Building Market Barometer is the importance executives place on reducing costs. So it's understandable that financial concerns top the list of obstacles to Green construction.

When asked the maximum length of payback period that would be acceptable when considering Green features, 44% of executives said they would accept five years, and 36% said they would accept six years or longer. While this reflects a shift from what executives expressed in the 2010 Barometer, where 33% said they would accept five years and 45% chose a longer time frame, it still indicates more executives are willing to look beyond the traditional period of one to three years to recover their investment, with fully 80% of executives willing to accept a payback period of five years or longer.





The CHAIRMAN. Thank you, Mr. Crasi, and thank you for your very specific suggestions here this morning.  
Let's go to Dr. Ted Gayer. Welcome.

**STATEMENT OF DR. TED GAYER, VICE PRESIDENT AND DIRECTOR OF ECONOMIC STUDIES, JOSEPH A. PECHMAN SENIOR FELLOW, THE BROOKINGS INSTITUTION**

Dr. GAYER. Thank you and good morning, Chairman Murkowski, Senator Cantwell and members of the Committee. I very much appreciate the opportunity to be here today to discuss energy efficiency legislation.

Many of the points I make come from articles I've co-authored with Kip Viscusi of Vanderbilt University, who couldn't be here today.

I will offer four main points that suggest we should take a cautionary approach to applying overly prescriptive mandates for energy efficiency levels. My comments are directed at the broader question of mandates, not the specific proponents of the 22 bills you are considering today, but I do hope they can offer useful, general guidance considering government's role in regulating energy and reducing pollution.

My first point is that market prices for energy and energy intensive products provide important information about both the strength of consumer demand and the scarcity of supply, but the prices can be misleading to the extent that they do not account for the associated pollution costs. In the market for appliances, for example, prices reflect how much consumers value certain features such as energy efficiency and convenience and they also reflect constraints on production such as the state of technology. The problem arises if the price that shows up on a consumer's electricity bill does not account for the environmental damage caused by the energies.

This leads to my second point. The best way to address environmental damage caused by energy use is for the government to charge a price for these pollution costs. By pricing pollution consumers and businesses would face the full cost of their energy use which would then create incentives to reduce pollution as cheaply as possible through some combination of new technologies, alternative fuels and conservation.

There are a number of reasons why mandates in particular do not work as well as the pricing approach.

First, the one size fits all mandate ignores a substantial diversity of preferences, financial resources and personal situations that consumers and businesses must consider.

Second, by lowering the energy costs of using a product a mandate provides an incentive for using these products more rather than less. Moreover mandates apply only to new products which can create an incentive for consumers and businesses to retain older, less environmentally friendly goods.

Mandates might be preferable to pricing approach when measuring pollution is costly or infeasible or when those choosing the technology do not pay for their energy costs. But this is typically, although not always, the case when it comes to energy use and greenhouse gases.

My third point is that for the recent mandates that Kip Viscusi and I examined we found that although they are frequently advertised as greenhouse gas initiatives in truth their environmental benefits are quite small and are frequently outweighed by the cost they impose. We found this result in our examination of a number of mandates for consumer goods such as clothes dryers and room air conditioners and others.

The question then is how are these mandates justified if they yield environmental benefits that are outweighed by their costs? This leads to my final point.

In order to justify these mandates the agencies assert that consumers and businesses are irrational when buying energy intensive goods and thus receive massive benefits if the government restricts their choices. The agencies invoke broad references to the behavioral economics literature to support the claims of consumer rationality but they present little or no concrete evidence.

They also ignore what I think is the key policy implication of behavioral economics which I think is appropriate for the legislation that you are considering today which is that it is more effective to address poor decision making by consumers and firms through softer regulatory nudges such as providing clearer information to consumers and encouraging voluntary measures rather than going straight to using costly mandates that restrict choice.

Given the unpopularity of levying a revenue neutral tax on pollution I fear we are instead opting for mandates that are advertised as environmental protection but are justified by weak claims of consumer protection. In other words we are shifting our regulatory priorities from the goal of reducing the harm individuals impose on others through pollution towards the more nebulous non-supported goal of reducing our individuals cost to themselves by purchasing reportedly uneconomic products.

This shifts results in a host of costly mandates that are less effective than a government policy that simply sets a price on pollution.

To summarize, to the extent that energy prices fail to incorporate the environmental cost of energy use, I believe the most sensible approach is to price those costs directly. Mandates are inferior policies but still may be better than doing nothing if the benefits exceed the costs.

Unfortunately by the agency's own estimates many of the mandates frequently lead to minimal environmental benefits that are less than the estimated cost. But in an effort to justify these uneconomic regulations the agencies have deviated from, what I believe, are well established economic tenants by asserting that consumers and businesses are irrational and that they therefore benefit from government mandates that restrict choice.

I believe the evidence for this view is weak, and assuming that citizens are not capable of making sensible decisions that affect their own pocketbooks is not the right way for us to advance the important goal of enhancing the quality of our environment.

Thank you.

[The prepared statement of Dr. Gayer follows:]

Testimony by Ted Gayer, Senior Fellow, Brookings Institution  
Hearing on Energy Efficiency Legislation  
U.S. Senate Committee on Energy and Natural Resources  
April 30, 2015

Chairman Murkowski, Senator Cantwell, and Members of the Committee, I appreciate the opportunity to appear here today to discuss energy efficiency legislation. Many of the points I will make come from articles I have co-authored with W. Kip Viscusi of Vanderbilt University.

I will offer four main points that suggest we should take a cautionary approach to applying overly-prescriptive mandates for energy efficiency levels. My comments are directed at the broader question of government mandates for energy efficiency, not the specific components of all the legislation you are considering today. But I do hope they can offer useful general guidance in considering government's role in regulating energy and in reducing pollution.

My first point is that market prices for energy and energy-intensive products provide important information about both the strength of consumer demand and the scarcity of supply, but the prices are misleading to the extent that they don't account for the associated pollution costs. In the market for appliances, for example, prices reflect how much consumers value certain features such as energy efficiency and convenience, and they also reflect constraints on production, such as the state of technology. The problem is that the price that shows up on a consumer's electricity bill does not account for the environmental damage caused by that person's energy use.

This leads to my second point: the best way to address environmental damage caused by energy use is for the government to charge a price for these pollution costs. By pricing pollution, consumers and businesses would face the full cost of their energy use, which would then create incentives to reduce pollution as cheaply as possible through some combination of new technologies, alternative fuels, and conservation.

There are a number of reasons why energy-efficiency mandates are more costly than the more market-friendly approach of setting a price on pollution. First, a one-size-fits-all energy-efficiency mandate ignores the substantial diversity of preferences, financial resources, and personal situations that consumers and businesses must consider. Regulators are less knowledgeable than consumers and businesses about the costs and desirability of various strategies to reduce pollution. That's why a signal to consumers and businesses in the form of higher prices leads to more cost-effective pollution reduction than a simple regulatory mandate. Second, by lowering the energy cost of using a product, an energy-efficiency mandate provides an incentive for using these products more, offsetting some of the energy reduction. Moreover, energy-efficiency mandates apply only to new products, which can create an incentive for consumers and businesses to retain older, less environmentally-friendly products. Regulations such as energy-efficiency mandates might be preferable to the market-based pricing approach when measuring pollution is costly or infeasible, or when those choosing the technologies do not pay for their energy costs, but this is not typically the case when it comes to energy use and greenhouse gases.

My third point is that, for the recent energy-efficiency mandates that Kip Viscusi and I examined, we found that although they are frequently advertised as "greenhouse gas initiatives," their environmental benefits are small and are frequently outweighed by the costs they impose. For example, for the recent fuel economy mandates for passenger cars, the EPA estimated they would cost \$192 billion, while the

greenhouse-gas benefits would only be \$46 billion – and most of these benefits would go to countries outside of the US. We examined energy-efficiency mandates for other consumer goods, such as clothes dryers and room air conditioners, and found a similar result: by the agencies' own estimates, the costs of these regulations outweighed the environmental benefits they achieved.

How then have the agencies justified energy-efficiency mandates that yield environmental benefits that are outweighed by their costs? This leads to my final point. In order to justify these mandates, the agencies assert that consumers and businesses are irrational when buying energy-intensive goods and thus receive massive benefits if the government restricts their choices. The agencies invoke broad references to the behavioral economics literature to support their claims of consumer irrationality, but they present little or no concrete evidence. They also ignore the key policy implication of behavioral economics, which is that it is more effective to address poor decision-making through soft regulatory “nudges” such as providing clearer information to consumers, rather than going straight to using costly mandates that restrict choice.

Given the political unpopularity of the more economically sound approach of levying a tax on pollution, I fear we are opting for policies that are advertised as environmental protection but are justified by weak claims of consumer protection. In other words, we are shifting regulatory priorities from the important goal of reducing the harm individuals impose on *others* (through pollution) towards the nebulous and unsupported goal of reducing harm individuals cause to *themselves* by purchasing purportedly uneconomic products. This shift results in a host of costly regulations that are less effective than a government policy that simply sets a price on pollution. It also establishes a dangerous precedent: if agencies can justify regulations on the unsubstantiated premise that consumers and businesses (but not regulators) are irrational, then they can justify the expansive use of regulatory powers to control and constrain virtually all choices consumers and businesses make.

To summarize: To the extent that energy prices fail to incorporate the environmental cost of energy use, the most sensible response is to price those pollution costs directly, and then allow consumers and businesses to respond to the higher prices as they see fit. Energy-efficiency mandates are inferior policies, but still may be better than doing nothing if the benefits exceed the costs. Unfortunately, by the agencies' own estimates, mandates frequently lead to minimal environmental benefits that are less than the costs. In an effort to justify these uneconomic regulations, the agencies have deviated from well-established economic tenets by asserting that consumers and businesses are irrational and that they therefore benefit from government mandates that restrict choice. The evidence for this view is weak, and assuming that citizens are not capable of making sensible decisions that affect their own pocketbooks is not the right way to advance the important goal of enhancing the quality of our environment.

The CHAIRMAN. Mr. Nadel, welcome to the Committee. Good morning.

**STATEMENT OF STEVEN NADEL, EXECUTIVE DIRECTOR,  
AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY**

Mr. NADEL. Okay, good morning.

And Madam Chair, it is good to see you in a new Chair since the last time I testified, and I look forward to your questions and working with all the other members of the Committee.

As a number of the witnesses have noted the United States has made substantial progress in reducing energy waste and improving energy efficiency in all sectors of our economy, but there is some potential to do much more. Our studies at ACEEE find that cost effective energy efficiency measures can reduce U.S. energy use by 40 percent or more.

Continued efforts to promote energy efficiency will reduce consumer and business energy costs, strengthen our economy, help improve the security and resiliency of our energy systems and protect the environment.

Passage of S. 535 early this month was a great start, but there is much more that the 114th Congress can do including enacting any of the bills before us today.

As we know today's hearing is on 22 different efficiency bills. We appreciate that the Committee is focusing a hearing on energy efficiency and that the Chairwoman has indicated that a forthcoming comprehensive energy bill will include a specific title on energy efficiency.

It has been eight years since Congress last passed a major piece of energy legislation. We have had a few smaller bills, but we look forward to hopefully completing a major piece this year.

History indicates that such legislation can only be enacted with broad, bipartisan support. Highly politicized issues are unlikely to receive the 60 votes that are needed in the Senate, and even if a bill passes in the Senate, getting a more conservative House and a more liberal President to accept the legislation will require sticking to provisions with broad, bipartisan support.

Based on these principles in my written testimony I divide the bills before us into seven categories. Now I am just going to discuss a few of those categories.

The first category and the one that should be the centerpiece of this legislation is bills that already have strong, bipartisan support.

The Shaheen/Portman, Portman/Shahen bill is the leading example of a bill in this category. It contains more than a dozen useful provisions.

In 2013 we estimated the energy savings from this bill and found that on a cumulative basis it would save about 12 quadrillion BTUs of energy. That is about how much energy Texas uses in a year. And Texas is, by far, our largest energy consumer.

Most of the energy savings in this bill come from the building code and mortgage underwriting sections. So those are particularly important.

As Senator Portman noted our 2013 analysis also found that this bill would support about 190,000 jobs by 2030.

There are a number of other bills, though, that are also in this first category of demonstrated bipartisan support such as S. 600, that Senator Klobuchar talked about earlier and Senator Hoeven, dealing with retrofits to nonprofit buildings.

S. 623, dealing with utility energy service contracts that Senator Schatz talked about.

And S. 858, dealing with the energy savings through public/private partnerships that a number of Senators both here and in the previous panel discussed.

So, that, I believe, should be at the heart of the bill.

There are also many bills that were introduced more recently and haven't had an opportunity to get that strong, bipartisan support. We see six of these bills as potentially falling into this category.

The Smart Building Acceleration Act that Senator Cantwell has introduced.

The Commercial Building Benchmarking bill that Senator Franken has introduced that goes a little bit farther than what's already in S. 535.

There's the Energy Star Integrity Act that Senator Risch did.

There's Senator Udall's Energy and Water Efficiency Act.

Senator Markey's Access to Consumer Energy Information Act as well as Senator Franken's bill on alternative fuel vehicles.

We'd also note there are a couple of other bills that are not in the hearing today that may fall into this category.

I would also note that there is one bill that we do support that we are unsure if it will have the bipartisan support.

This is the Energy Efficiency Resource Standard bill that Senator Franken introduced and that Senator Cantwell mentioned before. This would establish energy saving targets that electric and natural gas utilities must meet, the target slowly rising over time. Presently 24 states have such targets and they've proven to be very effective at both saving energy and doing so at low cost.

We estimate the energy savings from this bill is about three times what the Portman/Shahen bill would do. Ideally we do them both, but we see that as an important marker about what could be accomplished with Federal legislation.

Finally I'd note that there are a few bills that we have concerns about as written in current form.

This would be S. 1047 which reviews rulemaking proceedings and the bills on ceiling fans and furnaces. We think they are well intentioned but are poorly written and could cause some significant, adverse consequences in their current form. I have some specific written comments about particular problems with these bills, and I'm happy to answer further questions about them.

So with that, I'll conclude my testimony and look forward to your questions.

[The prepared statement of Mr. Nadel follows:]



**Testimony of Steven Nadel  
Executive Director  
American Council for an Energy-Efficient Economy (ACEEE)**

**To the Senate Energy and Natural Resources Committee**

**Hearing on Proposed Energy Efficiency Legislation**

**April 30, 2015**

**Summary**

The United States has made substantial progress in reducing energy waste and improving energy efficiency in all sectors of our economy. But there is the potential to do much more. Continued efforts to promote energy efficiency will reduce consumer and business energy costs, strengthen the economy, help improve the security and resiliency of our energy systems, and protect the environment. Passage of S. 535 earlier this month was a good start, but there is much more the 114<sup>th</sup> Congress can do to advance energy efficiency in the United States, including enacting many of the bills before us today.

Today's hearing is on 22 energy efficiency bills that have been introduced in the Senate this Congress. We appreciate that the Committee is focusing a hearing on energy efficiency and that Chairman Murkowski has indicated that a forthcoming comprehensive energy bill will include an energy efficiency title. It has been eight years since Congress passed a major piece of energy legislation. History indicates that such legislation can only be enacted with broad bipartisan support. Highly politicized issues are unlikely to receive 60 votes in the Senate, and even if a bill passes the Senate, getting both a more conservative House and a more liberal president to accept the legislation will require sticking to provisions with broad bipartisan support.

The bills before us today can be divided into several categories as follows:

1. Bills with strong bipartisan support that should be the centerpiece of an energy efficiency title
2. Bills with the potential for strong bipartisan support
3. Useful bills that could receive substantial bipartisan support if authorization offsets can be found
4. Bills we (ACEEE) support but that have uncertain prospects for strong bipartisan support
5. Bills we neither support nor oppose
6. Bills that need substantial work before we can support
7. Bills we oppose because they will decrease rather than increase energy efficiency

We support all the bills in the first four categories, are neutral on the one bill in the fifth category, and stand ready to work with sponsors to improve the bills in the fifth through seventh categories. We recommend that this committee report out a bill with broad support that includes provisions that already have bipartisan support, or that show great potential to receive such support. Based on our review of the various bills, such a package might include the following:

- S. 720 Energy Savings and Industrial Competitiveness Act (including S. 523 [schools], S. 1039 [data centers] and S. 869 [all of the above])
- S. 600 Energy Efficiency Retrofit Pilot Program
- S. 723 Utility Energy Service Contracts Improvement Act
- S. 858 Energy Savings Through Public-Private Partnerships
- S. 886 Smart Energy and Water Efficiency Act
- S. 1038 Energy Star Program Integrity Act
- S. 1044 Access to Consumer Energy Information
- S. 1046 Smart Building Acceleration Act
- S. 1052 Benchmarking

- S. 1053 Alternative Fueled Vehicle Fleets
- S. 703 WAP and SEP Reauthorization
- S. 1054 Smart Manufacturing
- S. 1055 Deep Energy Retrofits to Federal Buildings

Several other bills could also meet this criterion based on refinements to current language and/or identification of authorization offsets.

Congress has given bipartisan support to energy efficiency for many decades. We hope the 114<sup>th</sup> Congress can continue in this tradition and develop a bill with broad support that can pass the House and Senate and gain the president's signature.

## Introduction

My name is Steven Nadel and I am the executive director of the American Council for an Energy-Efficient Economy (ACEEE), a nonprofit organization that acts as a catalyst to advance energy efficiency policies, programs, technologies, investments, and behavior. We were formed in 1980 by energy researchers and are celebrating our 35<sup>th</sup> anniversary this year. Personally I have been involved in energy efficiency issues since the late 1970s and have testified multiple times before this committee and its subcommittees as well as before the House Energy and Commerce Committee.

Since ACEEE is 35 years old this year, we are currently conducting research on energy efficiency progress over the past 35 years. Our preliminary findings are that each major sector of our economy has shown efficiency improvements. Residential-sector energy use per capita is down 11 percent since 1980, commercial-sector use per square foot down 18 percent since its 1999 peak, industrial use per dollar value-added down about one-third relative to 1980, transportation energy use down 12 percent below its peak in 2007, power plant heat rates 8 percent lower than in 1980, and electric system transmission and distribution losses down 27 percent since 1990. We estimate that efficiency improvements saved American consumers and businesses roughly \$800 billion in 2014 and have also contributed to increased employment and economic growth, reduced energy imports, and a cleaner environment. These improvements have been driven by a combination of market forces and national and state policies, with the biggest gains often coming when market forces and policies are pulling together.<sup>1</sup>

Much greater savings are possible. A 2011 ACEEE report estimates that widespread use of energy efficiency technologies and practices can reduce US forecasted energy use by at least 40 percent by 2050.<sup>2</sup> In particular, new technologies and practices continue to be developed, and thus energy efficiency potential continues to grow. We regularly harvest low hanging fruit from this tree, but thus far, new fruit keeps growing back. The new “intelligent efficiency” technologies and practices promoted in S. 1046 and S. 1054 are just one example. We discuss these bills below.

The Senate Energy and Natural Resources (ENR) Committee has a long history of enacting bipartisan legislation that promotes energy efficiency, often as part of more comprehensive energy legislation. For example, comprehensive energy bills enacted in 1992, 2005, and 2007 all had major energy efficiency components. More recently, Congress has passed smaller energy efficiency bills in 2012 (the American Energy Manufacturing Technical Corrections Act) and 2015 (S. 535 passed just last week). S. 535 was an excellent down payment on the part of the 114<sup>th</sup> Congress.

Today’s hearing is on 22 energy efficiency bills that have been introduced in the Senate this Congress. We appreciate that the Committee is focusing a hearing on energy efficiency and that Chairman Murkowski has indicated that a forthcoming comprehensive energy bill will include an energy efficiency title. It has been eight years since Congress passed a major piece of energy legislation.

---

<sup>1</sup> ACEEE report to be published this summer.

<sup>2</sup> See <http://aceee.org/research-report/e121>.

History indicates that such legislation can only be enacted with broad bipartisan support. Highly politicized issues are unlikely to receive 60 votes in the Senate, and even if a bill passes the Senate, getting both a more conservative House and a more liberal President to accept the legislation will require sticking to provisions with broad bipartisan support. With this as background I now turn to discussion of the 22 bills before us today.

### **Discussion of Bills**

The bills before us today can be divided into several categories as follows:

1. Bills with strong bipartisan support that should be the centerpiece of an energy efficiency title
2. Bills with the potential for strong bipartisan support
3. Useful bills that could receive substantial bipartisan support if significant authorization offsets can be found
4. Bills we support but that have uncertain prospects for strong bipartisan support
5. Bills we neither support nor oppose
6. Bills that need substantial work before we can support
7. Bills we oppose because they will decrease rather than increase energy efficiency

We support all the bills in the first four categories, are neutral on the one bill in the fifth category, and stand ready to work with sponsors to improve the bills in the fifth through seventh categories.

#### **1. BILLS WITH STRONG BIPARTISAN SUPPORT**

Several of the bills before us today have strong bipartisan support and should be the centerpiece of an energy efficiency title to a more comprehensive energy bill.

#### **S. 720 Energy Savings and Industrial Competiveness Act**

This bill was authored by Senators Portman and Shaheen and also has many cosponsors. The bill has been refined and debated for several years. Prior versions of this bill were reported out of this committee with a strong bipartisan majority. This year's bill is very similar to the prior bills and has our strong support.

In 2013 ACEEE estimated the likely energy savings from the then-current version of this bill and a variety of potential amendments, some of which have since been added to the bill.<sup>3</sup> We also prepared a supplemental analysis on the Sensible Accounting to Value Energy (SAVE) Act which is now included in Section 433 in the present bill. Overall, we estimated that these bills would save about 12 quadrillion Btu (quads) of energy on a cumulative basis between 2014 and 2030 (a quadrillion is 10 to the 15<sup>th</sup> power). By way of comparison, the United States uses just under 100 quads per year, and Texas, the largest energy consumer, uses about 12 quads per year. Our analysis found that the majority of the

---

<sup>3</sup> See <http://aceee.org/white-paper/shaheen-portman-2013>.

savings would come from Section 101 (encourage and assist with updates to model and state building energy codes), with substantial savings also coming from SAVE (improve mortgage underwriting practices to recognize the operating cost savings of efficient homes) and from the industrial section. We also found that the Portman-Shaheen bill would support 66,000–81,000 jobs in 2020 and 164,000–174,000 jobs in 2030 (rising to about 193,000 jobs when SAVE is added to the analysis).

The two most notable provisions in S. 720 are:

- *Section 101 regarding building codes.* The Department of Energy (DOE) is directed to set energy savings targets, based on analysis and public comments, and provide technical assistance to the code-setting and standard-development organizations. After model building codes are updated, states are to certify whether or not they have updated their own codes to meet or exceed the energy savings targets, and then whether they have achieved full compliance. The legislation reserves adoption and enforcement of model building codes to the state and local governments with encouragement and assistance from DOE.
- *Section 422 (SAVE).* Requires HUD to develop and issue updated underwriting and appraisal guidelines for borrowers who voluntarily submit a qualified home energy report, such as a Home Energy Rating System (HERS) score. The provision would cover any loan from HUD and other federal agencies. The updated guidelines would adjust underwriting criteria and home valuation to account for expected energy cost savings in considering the borrower's ability to repay the loan and in considering the assessed value of the home. If no qualified energy report is provided, no adjustment would be made. Lenders would be required to inform loan applicants of the costs and benefits of improving the energy efficiency of a home.

Other notable provisions include the following:

- Establishing a DOE program for university-based building training and assessment centers modeled after the existing Industrial Assessment Centers (IACs).
- Directing DOE to work on several initiatives to improve the efficiency of schools.
- Requiring the administrator of the General Services Administration (GSA) to pursue several initiatives to reduce energy use in federally leased buildings.
- Streamlining efforts by directing IACs to coordinate with the Manufacturing Extension Partnership Centers and DOE's Building Technologies Program, and increasing partnerships with the national laboratories and energy service and technology providers to leverage private-sector expertise.
- Establishing a "Supply Star" program at DOE, modeled on and in coordination with ENERGY STAR<sup>®</sup>, to identify examples of and opportunities for promoting highly efficient supply chains.

- Requiring DOE, in consultation with other federal agencies, to issue recommendations for using information and communications technologies to improve energy efficiency.
- Requiring federal agencies to undertake several initiatives to facilitate data center optimization and consolidation.
- Authorizing a demonstration program to allow the secretary of Housing and Urban Development (HUD) to use budget-neutral performance-based contracts to conduct energy and water efficiency upgrades to HUD-assisted multifamily housing units.
- Requiring DOE to conduct an ongoing review into private-sector green building certification systems and to work with other agencies to determine which certification systems would encourage the most comprehensive and environmentally sound approach to certifying federal buildings.
- Extending existing federal building energy efficiency improvement targets, and requiring federal energy managers to explain why agencies did not implement any energy- or water-saving measures that were deemed life-cycle cost effective in required evaluations.
- Strengthening energy efficiency standards for new federal buildings and applying them to alterations of existing federal buildings.
- Requiring DOE to recognize voluntary, independent verification programs for air conditioning, furnace, boiler, heat pump, and water heater products.

While we strongly support S. 720, a few refinements are in order. First, with enactment of S. 535, the provisions in S. 535 can be dropped from S. 720. Second, a few updates to the industrial section would be useful. Specifically, we no longer see the need for the Advanced Manufacturing Office steering committee, nor do we see a need for Congress to establish a Sustainable Manufacturing Initiative, as DOE is now doing many of these activities using existing authority.

Third, DOE has some concerns with Section 441 as written. Discussions are now underway to resolve those concerns, and some tweaks to Section 441 will be needed when these discussions are completed.

I also note that several of the bills before us today appear to overlap with S. 720, and therefore I do not discuss them separately. These are S. 523 (schools), S. 1039 (data centers), and S. 869 (all of the above).

#### **S. 600 Energy Efficiency Retrofit Pilot Program**

S. 600, introduced by Senators Klobuchar, Hoeven, Stabenow, Risch, Blunt, and Schatz, would provide matching grants to help nonprofit organizations save energy; the nonprofit organizations themselves would have to provide a significant contribution. This modest pilot program (\$10 million per year authorized) is worth pursuing.

**S. 723 Utility Energy Service Contracts Improvement Act**

Utility Energy Service Contracts (UESCs) allow utilities and federal government agencies to enter into long-term agreements to save energy. They are a companion to Energy Saving Performance Contracts (ESPCs) under which federal agencies work with private energy service companies. Under current law, ESPC contracts, which measure, verify, and guarantee energy savings, can be as long as 25 years. S. 723, sponsored by Senators Schatz, Alexander, Coates, and Coons, would establish the same 25-year cap for UESCs that measure, verify, and either guarantee or assure savings.

**S. 858 Energy Savings Through Public-Private Partnerships**

This bill, introduced by Senators Gardner, Coons, Portman, and Shaheen, would clarify ambiguous provisions in the Energy Savings Performance Contracting statute around use of operations and maintenance savings, and the federal government's ability to take renewable energy credits and utility rebates. It also would provide reporting requirements to Congress.

**2. BILLS WITH THE POTENTIAL FOR STRONG BIPARTISAN SUPPORT**

Many of the bills in today's hearing were recently introduced by members from one party or the other, without sufficient time to enlist bipartisan support. Several of these bills have the potential for such support because they provide workable strategies to encourage energy efficiency without substantial financial expenditures or government mandates. We classify six of today's bills in this category and discuss them in this section, starting with bills we have been involved with and going on to other bills in numerical order.

**S. 1046 Smart Building Acceleration Act**

Smart buildings make use of information and communications technology to identify building operation problems and, depending on the problem, either automatically correct it or notify building operators so they can correct it. Energy savings of 15 percent or more can result. S. 1046, introduced by Senator Cantwell, would encourage expanded use of smart building technologies by directing the Secretary of Energy to (1) survey private-sector smart buildings to assess costs and benefits and identify best practices, (2) work with federal agencies to implement and evaluate smart building technology in several federal buildings, (3) promote smart building concepts through existing federal programs such as the Better Buildings Challenge and R&D programs, and (4) report to Congress on the results of this work with recommendations for accelerating the use of smart building techniques.

**S. 1052 Benchmarking**

This bill, introduced by Senator Franken, extends provisions in S. 535, which recently passed Congress, and also extends a provision in S. 720. All three bills promote benchmarking of commercial buildings. Benchmarking provides information to building owners so they can identify buildings most in need of improvement. It can also help potential building purchasers and tenants learn about a building's energy

bills and make informed purchasing and leasing decisions. All three bills call for a DOE study on the impact of state and local performance benchmarking and disclosure policies for commercial and multifamily buildings, and for an identification of best practices. S. 1052 and S. 720 go a step farther and would offer competitive awards to utilities, their partners, and utility regulators for setting up systems to provide aggregated tenant consumption data to building owners so they can benchmark their buildings. Without tenant data, not all energy use is included when buildings are benchmarked. Utilities aggregate the data to protect tenants' privacy. S. 1052 would go an additional step farther by providing competitive awards to states and units of local government to help them implement the best practices in the DOE report. The cost of this program is modest: \$10 million per year is authorized.

**S. 1038 Energy Star Program Integrity Act**

This bill, introduced by Senator Risch, would provide liability protection to participants in the voluntary ENERGY STAR program. Several lawsuits have been filed recently against manufacturers of decertified ENERGY STAR products. EPA has procedures for dealing with such issues, and this bill would have EPA, rather than the courts, decide on whether consumer compensation is needed. Manufacturers would be protected from litigation as long as equipment is properly certified and manufacturers comply with any corrective measures deemed appropriate by EPA. This bill was developed at the request of manufacturers, who warn that litigation costs threaten their participation in ENERGY STAR.

**S. 886 Smart Energy and Water Efficiency Act**

This bill, introduced by Senator Udall, would make competitive grants available to utilities, municipalities, water districts, and other water authorities for novel and innovative technology-based solutions that improve the energy and water efficiency of water systems, including smart meters for water. Grants would come out of existing funds.

**S. 1044 Access to Consumer Energy Information**

With the advent of smart meters, consumers can access a great deal of energy information to help them manage their energy bills. Some utilities provide this information to consumers, others do not. S. 1044, introduced by Senator Markey, would have DOE establish voluntary guidelines for consumer access to their own energy consumption information. Standardized guidelines make it easier for utilities and state regulators to make these data available, but decisions on whether to use the guidelines would be left to utilities and states. Thus this bill encourages, but does not mandate, making energy use information available to consumers. Under the bill, consumers could permit their energy use information to be made available to energy service providers they designate; this decision would be up to each individual consumer. The bill calls for extensive consultation with interested parties to develop the guidelines, and specifically includes data security and consumer privacy as issues to address.

**S. 1053 Alternative Fueled Vehicle Fleets**

This bill, authored by Senator Franken, would authorize the inclusion of alternative fueled vehicles in federal ESPCs. It does not require federal agencies to include vehicles in their ESPC projects, but simply authorizes them to do so. The bill would also allow, but not require, agencies to participate in utility incentive programs for such vehicles.

**3. USEFUL BILLS THAT COULD RECEIVE SUBSTANTIAL BIPARTISAN SUPPORT IF AUTHORIZATION OFFSETS CAN BE FOUND**

The following four bills help advance energy efficiency in important ways but have significant cost. We recommend that the Committee look for authorization offsets so that some, if not all, of these provisions can move forward. I believe all four of these bills will be discussed by the witness from the National Association of State Energy Officials, so I leave the details to him.

**S. 703 WAP and SEP Reauthorization**

S. 703, introduced by Senators Coons, Collins, Reed, Schatz, and Shaheen, reauthorizes the low-income Weatherization Assistance Program (WAP) and the State Energy Program (SEP). WAP has been the key federal program to help low-income households reduce their energy bills. It makes sense to help these households reduce their energy bills on an ongoing basis instead of just helping them pay bills through the federal Fuel Assistance program. (Recall the old proverb, “Give a man a fish, and you feed him for a day; show him how to catch fish, and you feed him for a lifetime.”) The WAP program has been very successful: the last “meta-evaluation” of the program found average energy savings of more than 20 percent.<sup>4</sup> The new legislation includes several useful improvements to the current program, including a requirement that DOE develop minimum professional standards for WAP contractors and workers, a requirement for an independent quality assurance program, and a new competitive leveraged grant program for nonprofit agencies with a track record of success in serving low-income communities. This bill also reauthorizes the SEP program, which has been a key funding program for state energy office activities in all states.

This bill includes important improvements to these programs and we urge its passage. The WAP and SEP programs are ongoing and subject to the annual appropriations process. The appropriations process determines their cost; reauthorization of these programs will not cost a dime, and refusing to reauthorize them will not save any money.

In our view, this bill is very different from the next three bills we discuss, because it deals with an ongoing program with broad support, while the next three bills would establish new programs.

---

<sup>4</sup> See Martin Schweitzer, *Estimating the National Effects of the U.S. Department of Energy’s Weatherization Assistance Program with State Level Data: A Meta-Evaluation Using Data from 1993-2005*, Oak Ridge National Laboratory, 2005. [http://weatherization.ornl.gov/pdfs/ORNL\\_CON-493.pdf](http://weatherization.ornl.gov/pdfs/ORNL_CON-493.pdf).

**S. 878 Residential Energy Savings Act (RESA)**

Introduced by Senators Sanders, Cantwell, Wyden, King, Whitehouse, Markey, and Franken, S. 878 would establish a pilot program for state loans for energy efficiency upgrades in residential buildings. Many homeowners lack the capital to make energy efficiency investments, and this bill would help states and other eligible entities to provide this capital at attractive terms, often working with banks and other financial institutions. The bill would have DOE make loans to states, local governments, utilities, and other eligible entities who would use the funds to recapitalize, expand, or begin energy efficiency loan programs. The loans would be repaid with interest, providing for a high degree of cost recovery. States and other eligible entities would apply for funding, and DOE would evaluate the applications based on criteria designed to encourage best-practice program design, including innovative approaches such as on-bill repayment. Since the federal cost of capital is lower than its cost for many eligible entities, the program could provide a moderate-cost source of loan capital. To the extent states and other eligible entities could provide or raise additional funds for such activities as loan loss reserves, interest rates that are very attractive to consumers may be possible.

**S. 893 Energy Productivity Innovation Challenge Act (EPIC)**

S. 893, introduced by Senators Warner and Manchin, would establish a competitive program to help states improve energy productivity. Energy productivity is a measure of the amount of goods and services provided in the economy per unit of energy use. Higher energy productivity means a more efficient economy and it spurs economic growth. The bill would provide initial grants to up to 25 states to develop energy productivity plans, and then would provide grants to up to 6 states based on effective initial implementation of the plans. This program would encourage innovative approaches to improving energy productivity and should be a priority if offsets can be found.

**S. 888 PREPARE Act**

Senators Schatz and Heinrich authored this bill to encourage regional energy partnerships. The bill would provide grants to groups of states for comprehensive regional planning activities. Remote states (Alaska and Hawaii) would also be eligible for grants for statewide planning activities. The impact of this broader energy planning bill on energy efficiency is unclear.

**4. BILL WE SUPPORT BUT THAT HAS UNCERTAIN PROSPECTS FOR STRONG BIPARTISAN SUPPORT****S. 1063 American Energy Efficiency Act**

This bill, introduced by Senator Franken, would establish a national energy efficiency resource standard (EERS) to be administered by each state. An EERS establishes energy saving targets that electric and natural gas utilities must meet, with the target slowly rising over time. Utilities meet these targets by offering programs to help their customers save energy. Target levels are set based on experience established in many states on what can be achieved. Presently 24 states have such standards<sup>5</sup> and they have proven to be very effective energy savers. In 2014 ACEEE reviewed the EERS standards that had

---

<sup>5</sup> See <http://aceee.org/topics/energy-efficiency-resource-standard-eers>.

been in place long enough to be evaluated and found that on average they were exceeding their savings targets.<sup>6</sup> Another 2014 ACEEE study looked at utility energy efficiency programs in 20 states with good evaluation data and found that they were costing utilities an average of 2.8 cents per kWh saved, which is much less than the cost of new electricity supply.<sup>7</sup> This study found that for most states the benefits of these programs were about two to three times the cost.

S. 1063 establishes the basic parameters of a national EERS, and calls for a DOE rulemaking to work out the details. In 2013, ACEEE estimated that a national EERS proposal that was similar to S. 1063 would save 37 quads of energy on a cumulative basis over the 2015–2030 period. This was about three times the savings we estimated for the 2013 version of the Portman-Shaheen bill. We will be revising these savings numbers in the next few months based on the latest data and bills.

Given the very high savings of this bill, we hope this committee can give it serious consideration. At a minimum, we urge this committee to keep the energy savings that an EERS can achieve in mind as it constructs the efficiency title of its comprehensive energy bill. A useful yardstick for an energy efficiency title will be whether it can save as much energy as a national EERS alone would save.

#### ***5. BILL WE NEITHER SUPPORT NOR OPPOSE***

##### **S. 939 Study on Green Building Programs**

This bill was introduced by Senators Flake and Booker and asks DOE to conduct a study on existing federal programs to encourage green building. The study is to look at the costs and benefits of these programs and make recommendations to Congress. The bill labels these programs duplicative; this is a value judgment that should be determined by the study and not preordained. The study would require time and resources, and is not clearly directed toward the recommendations, but the recommendations on coordinating the programs and making them more effective may have some useful results.

#### ***6. BILL THAT NEEDS SUBSTANTIAL WORK BEFORE WE CAN SUPPORT***

##### **S. 1047 Review Rulemaking Proceedings**

This bill, introduced by Senator Alexander, while well intended, is not very workable as written. The bill has the laudable goal of promoting coordination between rulemakings of various agencies. However, it puts all of the onus on only one agency (DOE), appears to set up a very cumbersome process to address the issue, and is ambiguous on some important details. We suggest that staff rework the bill to:

- Ask OMB to identify rules that may need coordination, as OMB is the agency that knows about all recent and pending rules.

---

<sup>6</sup> See <http://aceee.org/research-report/t1403>.

<sup>7</sup> See <http://aceee.org/research-report/t1402>.

- Ask DOE and other agencies to attempt to coordinate rules as to requirements and effective dates so as to maximize net benefits, while reducing burdens as much as possible consistent with the goal of maximizing net benefits.
- Clarify that existing laws still apply and that this bill does not change the underlying requirements in existing statute.

#### **7. BILLS WE OPPOSE BECAUSE THEY WILL LIKELY DECREASE ENERGY EFFICIENCY**

##### **S. 1048 Ceiling Fans**

This bill, authored by Senator Alexander, would remove the authority for DOE to amend existing ceiling fan efficiency standards and would violate several longstanding principles of equipment efficiency standards that go back to the 1980s. First, it upends a compromise between state governments, the federal government, and manufacturers that is at the core of equipment efficiency standards. Multiple states had efficiency standards in the 1980s, but manufacturers asked for uniform national standards. States agreed that their standards could be preempted by strong federal standards, including regular updates to the standards based on principles agreed to by states, manufacturers, and other parties in the National Appliance Energy Conservation Act of 1987. S. 1048 overrides this agreement by continuing to preempt state standards while preventing DOE from revising the standards.

Second, Congress has a long history of legislating on standards issues when there is a consensus, but, absent consensus, leaving technical decisions to DOE. This principle has applied to legislation adopted during times when either one party or the other controlled Congress. DOE is now conducting a technical rulemaking on ceiling fan standards and has yet to propose a specific standard. Some manufacturers are concerned they will not like the standard DOE sets and seek to prevent DOE action. They anticipate that DOE will seek to ban decorative fans or to require the use of advanced motors on all fans, despite verbal statements to the contrary by DOE officials at a workshop on their preliminary analysis. On the other hand, at least one manufacturer supports stronger standards. Rather than Congress stepping in without technical expertise, a better course of action would be to let DOE propose a specific standard, and then have all parties comment on the proposal so that DOE could revise it to reflect facts elucidated during the comment period. Substantial energy savings are at stake: according to DOE's preliminary analysis savings could range from about 1 to 3 quads depending on the level DOE ultimately selects. These savings will not happen if S. 1048 is enacted.

##### **S. 1029 Furnaces**

This bill, introduced by Senators Hoeven and Alexander, would have Congress weigh in on another DOE rulemaking, this one for standards for residential furnaces. Such standards were established by Congress in 1987 and have not been updated since then (rules were finalized in 2007 and 2011 but in both cases legal suits led to new rulemakings). DOE is now trying again under a settlement agreement that ended the last lawsuit which calls for completion of this rule by March 2016. DOE has issued a notice of proposed rulemaking (NOPR), with comments due June 10, 2015. S. 1029 would prevent DOE from issuing a final rule and instead would institute an advisory group process that would extend at least

a couple of years from date of enactment. S. 1029 would override the terms of the settlement that called for a final rule by April 2016, making it less likely that parties would agree to settlements in the future (why settle if a party to the agreement then runs to Congress to change the settlement?). Also, assuming Congress passes an energy bill in late 2015, this means that the earliest any new standard could take effect would be late 2022 (two years for the new advisory group process plus five years provided under current law from publication of a final rule until it takes effect). This would be 35 years after the current standard was set!

We are aware of many parties' concerns about DOE's proposed standard, and discussions among the parties have been taking place to find a settlement acceptable to all. DOE knows about these concerns, and we have heard reports that it is exploring other pathways it can take to address them. Congress should allow both the DOE rulemaking and the settlement discussions of the parties to proceed without interference. In our view a settlement could be reached this year if all parties negotiate in good faith. This bill is counterproductive as it would delay a very overdue standard by about two years and also reduce the incentive for some parties to reach agreement. Substantial energy savings are at stake: DOE estimates its proposed standard would save 2.78 quads of energy.

#### **Other Bills Worth Noting**

Two other bills were recently introduced, and while not included in this hearing, are worth noting. Both bills fall into our second category, i.e., bills with the potential for strong bipartisan support.

##### **S. 1054 Smart Manufacturing**

This bill was introduced by Senator Shaheen to encourage the use of smart energy saving techniques in manufacturing. It is a companion to S. 1046 which promotes smart buildings. I believe this bill will be included in a future Energy and Natural Resources Committee hearing but should in addition be considered an energy efficiency bill.

##### **S. 1055 Deep Energy Retrofits to Federal Buildings**

Senator Franken has another bill that would encourage deep energy saving retrofits in federal buildings. The bill defines a deep retrofit as one that reduces energy use by 35 percent or more. This bill would expand GSA's successful deep energy retrofit program, effectively reducing federal building energy-use and costs and thereby saving taxpayer dollars. The bill was referred to Committee on Environment and Public Works, but we would urge this committee to be supportive if it is proposed as an amendment on the Senate floor.

#### **Conclusion**

The United States has made substantial progress in reducing energy waste and improving energy efficiency in all sectors of our economy. But there is the potential to do much more. Passage of S. 535 earlier this month was a good start, and now the 114<sup>th</sup> Congress can make much greater strides in advancing energy efficiency by enacting many of the bills before us today. In particular, we recommend that this committee report out a bill with broad bipartisan support. Bills in such a package might include:

- S. 720 Energy Savings and Industrial Competitiveness Act (including S. 523 [schools], S. 1039 [data centers] and S. 869 [all of the above])
- S. 600 Energy Efficiency Retrofit Pilot Program
- S. 723 Utility Energy Service Contracts Improvement Act
- S. 858 Energy Savings Through Public-Private Partnerships
- S. 886 Smart Energy and Water Efficiency Act
- S. 1038 Energy Star Program Integrity Act
- S. 1044 Access to Consumer Energy Information
- S. 1046 Smart Building Acceleration Act
- S. 1052 Benchmarking
- S. 1053 Alternative Fueled Vehicle Fleets
- S. 703 WAP and SEP Reauthorization
- S. 1054 Smart Manufacturing
- S. 1055 Deep Energy Retrofits to Federal Buildings

Several other bills could also meet this criterion based on refinements to current language and/or identification of authorization offsets.

I also want to note that, just as ACEEE analyzed the energy and economic impacts of energy efficiency bills in 2013, we plan to do so again later this year based on the energy efficiency titles reported out of committee in both the Senate and the House. We hope our analysis will aid in refining the ultimate legislation as well as showing the many benefits that energy efficiency legislation can bring to consumers, businesses, and the United States economy.

Congress has given bipartisan support to energy efficiency for many decades. We hope the 114<sup>th</sup> Congress will continue this tradition and develop a bill with broad support that can pass the House and Senate and gain the president's signature.

This concludes my testimony. Thank you for the opportunity to present these views.

The CHAIRMAN. Thank you, we appreciate that, and we will soon turn to questions after we hear from Mr. Therriault.

Welcome to the Committee, Gene.

**STATEMENT OF HON. GENE THERRIAULT, VICE-CHAIRMAN, NATIONAL ASSOCIATION OF STATE ENERGY OFFICIALS, AND DEPUTY DIRECTOR, ENERGY POLICY AND OUTREACH, ALASKA ENERGY AUTHORITY**

Mr. THERRIAULT. Thank you, Madam Chairman. I wanted to thank you and members of the Committee.

I am Gene Therriault, Deputy Director of state-wide energy policy development with the Alaska Energy Authority and Vice Chairman of the National Association of State Energy Officials. I'd like to thank you, Madam Chairman, for the opportunity to speak today and I would ask that my entire written testimony be included in the record.

I am testifying today on behalf of NASEO, whose membership includes the nation's 56 governor-designated state and territory energy offices. Across the nation the energy offices are focused on economic development and balanced energy policies. Energy efficiency is certainly included in that mix of policies and programs.

NASEO applauds the Committee for holding this hearing on a large number of energy efficiency legislative items. Our written testimony discusses the bills in greater detail and sets forth examples of state programs that have achieved tremendous success. These programs could be expanded if a number of the bills you are considering today were to be passed into law.

Specifically, NASEO endorses the Weatherization Enhancement and Local Energy Efficiency Investment and Accountability Act. That is Senate bill 703 which would reauthorize the appropriations for the state energy programs and reauthorize the weatherization assistance program. This bill is sponsored by Senators Coons, Collins, Reed and Shaheen and recognizes the value of this longstanding partnership between the states and the Federal Government. It helps real Americans every day. The state energy program provides formula funding for the states to support a range of activities for energy efficiency and energy emergency preparedness, and the flexibility that is involved in that piece of legislation or those programs is very key for states.

Weatherization has helped make the homes of 7.4 million families across the nation more energy efficient thus helping the poor, elderly, disabled and veterans every single day. For example, the \$7 billion per year energy services performance contracting industry is an example of state energy offices working with the private sector to save taxpayer dollars.

NASEO also supports the energy savings and Industrial Competitiveness Act, Senate bill 720, the Shaheen/Portman bill, also the Energy Savings Through Public/Private Partnership Act which is S. 858, the Energy Productivity Innovative Challenges Act which is S. 893, the Residential Energy Savings Act, S. 878, the PREPARE Act which is S. 888 and the Energy Retrofitting Assistance to Schools, which you've heard about previously, which is S. 523.

The NASEO members and leadership are still reviewing the other bills that have been brought before the Committee and we

may have further comments as you continue your proceedings on the energy legislation.

In Alaska, like other states, we leverage our state energy program dollars to address important energy needs. Again, it is a partnership between the states and the Federal Government and is a rare program because of the degree of flexibility that is given to each state under the funding that is provided. Across the nation every Federal dollar in this program leverages almost 11 other dollars that come in from different sources and saves over seven dollars for every Federal dollar spent.

My colleagues and I at different state energy offices work every day to break down barriers and assist businesses and homeowners. While the states represent a wide range of political views, we all see the value of these programs since the production and efficient use of energy is critical to our local and state economic prosperity.

I would also be remiss if I did not briefly comment on the Quadrennial Energy Review, the QER.

You had Secretary Moniz before the Committee on the 28th of this month, and the Secretary and his staff have been very open to states with regard to the QER and solicited input from the states.

There are a number of opportunities for addressing our critical infrastructure, energy infrastructure, needs and to address our energy challenges including energy efficiency. The QER is a positive step in understanding the current status of our energy, nation's energy, programs and infrastructure. However, NASEO wants to encourage the maximum collaboration with states as this program continues to progress.

For example, the process could benefit from a closer collaboration with the State of Alaska that takes full advantage of decades of investment in innovation in serving energy needs in the Arctic.

We look forward to working with the Committee and the DOE in implementing many of the recommendations contained in the QER.

And with that, that concludes my formal oral statements. I do want to thank you, Madam Chairman, and the rest of your colleagues in all your efforts to get successful passage of Senate bill 535.

Thank you.

[The prepared statement of Mr. Therriault follows:]

BEFORE THE  
COMMITTEE ON ENERGY AND NATURAL RESOURCES  
UNITED STATES SENATE  
HEARING ON ENERGY EFFICIENCY LEGISLATION  
APRIL 30, 2015

TESTIMONY OF

GENE THERRIAULT  
DEPUTY DIRECTOR  
ALASKA ENERGY AUTHORITY  
AND VICE CHAIR OF THE  
NATIONAL ASSOCIATION OF STATE ENERGY OFFICIALS

Chairman Murkowski, Ranking Member Cantwell and members of the Committee, I am Gene Therriault, Deputy Director of Statewide Energy Policy Development with the Alaska Energy Authority; and Vice Chair of the National Association of State Energy Officials (NASEO). I would like to thank the Committee for the opportunity to speak with you today as you consider this important package of energy efficiency legislation. We applaud the Committee for holding this legislative hearing on a variety of energy efficiency legislative matters. NASEO recognizes the value of the four building blocks that the Chairman has set forth regarding energy legislation, and today I will discuss the energy efficiency legislation. However, it is critical that we put this legislation in context. The state-federal relationship in energy policy is important and cannot be overlooked. Sometimes the myopia of Washington, D.C. makes it difficult to recognize the value of activities outside of the beltway. We look forward to continuing to work with both the Majority and Minority on the Committee. I would be remiss if I did not thank the Chairman for the open process she has initiated, including critical "listening sessions." Staff work by Cathy Cahill, Chester Carson and Al Stayman, on both sides of the aisle, has been extraordinary.

As you know, energy efficiency is one of America's greatest energy resources and is essential to our country's energy independence, economic prosperity, and environmental quality. Being able to take full advantage of energy efficiency requires public-private partnerships and practical policies such as those contained in the legislation you are considering today. The passage of the legislation we support will benefit all the states across the nation and every sector of the economy, including energy cost savings for business, consumers, and government – greatly enhancing our economic competitiveness. We wanted to note that energy efficiency programs have a 40-year track record of success, with enormous remaining potential. For the past 12 years, our economy has grown while energy use has declined.

I am here representing NASEO, whose membership includes the nation's 56 governor-designated State and Territory Energy Offices. In my role as Vice Chair of NASEO, I have the benefit of hearing from my peers in other states about the economic and energy successes of energy efficiency. Across the nation state energy offices are working in partnership with business, consumers, and other state and local government agencies. I will share some of these successes with you today.

First, NASEO greatly appreciates the Committee's efforts to ensure the successful passage of S.535 – The Energy Efficiency Improvement Act – which certifies the energy performance of commercial rental properties, removes a regulatory barrier to the use of large, grid-enabled, electric water heaters, and encourages energy efficiency improvements in federal buildings. With regard to today's hearing, NASEO strongly supports the following bills under consideration: the Weatherization Enhancement and Local Energy Efficiency Investment and Accountability Act (S.703); the Energy Savings and Industrial Competitiveness Act of 2015 (S.720); the Energy Savings Through Public-Private Partnerships Act of 2015 (S. 858); the Energy Productivity Innovation Challenge Act of 2015 (EPIC) (S. 893); the Residential Energy Savings Act (RESA) (S. 878); the PREPARE Act (S. 888); and Energy Retrofitting Assistance to Schools (S. 523).

**S. 703: The Weatherization Enhancement and Local Energy Efficiency Investment and Accountability Act**

We want to thank the bi-partisan group of Senators who sponsored this bill, including Senators Coons, Collins, Reed and Shaheen. NASEO heartily endorses this critical legislation which reauthorizes appropriations for the U.S. State Energy Program (SEP), without substantive changes to the underlying statute. The bill would also reauthorize the Weatherization Assistance Program, with some crucial updates. It recognizes the long-term success of the program and the effectiveness of the network that delivers the program, including non-profits and community action agencies. First, the bill would update WAP by also creating opportunities for broader non-profit participation by establishing a complementary, competitive grant program. This will allow participation by other entities, such as voluntary organizations like Habitat for Humanity and Rebuilding Together. For example, Habitat for Humanity has expanded beyond its voluntary new construction work to include significant rehabilitation and repairs on older or foreclosed homes, and this includes weatherizing them to improve their energy efficiency. Addressing the energy needs of low-income households is imperative, as illustrated in Habitat's 2015 Shelter Report, entitled, "Less is More: Transforming Low-Income Communities Through Energy Efficiency." Second, the bill includes language calling for more rigorous standards for weatherization implementation.

Both NASEO and our colleagues at the National Association of State Community Services Programs (NASCSPP) strongly support WAP reauthorization as presented in S. 703, which provides realistic funding levels, given current budget constraints. Chairman Murkowski, from the experience of the program in your state of Alaska, WAP is a proven, cost-effective, and successful program, and has helped low-income families, seniors, veterans, and individuals with disabilities make lasting and cost-effective energy efficiency improvements to their homes.

Before I discuss the specifics related to Alaska and NASEO's endorsement of the aforementioned bills, I would like stress both Alaska's and NASEO's strong support of the SEP and provide some additional details and a recommendation for the Committee's consideration. SEP is among the most successful energy programs supported by Congress and it is the only program operated by the U.S. Department of Energy which provides formula funding directly to the states to strategically target energy efficiency, renewable energy, energy emergency preparedness, and other priorities. It is important to note that NASEO, and all 56 State and Territory Energy Offices, strongly believe that funding for SEP should be for the *base program formula funding* that allows states to set and target their own energy opportunities, within program guidelines. In recent years – at their discretion – DOE has utilized a portion of the states' formula funds for competitive awards to the states. However, DOE's practice in this area means that a portion of the awards focus on priorities set by DOE. Moreover, the resources required for states to respond to the competitive solicitations puts states with smaller staffs – such as Alaska – at a disadvantage and adds unnecessary costs as compared to the successful formula SEP funds. For this reason, we urge that all SEP funds be provided on a formula basis as Congress originally intended. Other pieces of legislation that we are discussing today address competitive programs for the states to promote specific policies.

The good news is that states have an extraordinary and well-documented track record of utilizing all SEP funds to leverage significant project and program funding and drive exceptional results for taxpayers. Oak Ridge National Laboratory (ORNL) completed a national evaluation of the states' use of SEP funding and concluded, "The impressive savings and emissions reductions numbers, ratios of savings to funding, and payback periods . . . indicate that the State Energy Program is operating effectively and is having a substantial positive impact on the nation's energy situation." ORNL found that \$1 in SEP funding yields: \$7.22 in annual energy cost savings; \$10.71 in leveraged funding from the states and private sector in 18 types of project areas; annual energy savings of 47,593,409 million source BTUs; and annual cost savings of \$333,623,619. It is an exceptional program by any measure.

Formula SEP funding provides states a flexible means to implement the state-directed priorities, such as the following:

- Developing comprehensive state energy plans, on behalf of governors, which identify untapped local energy resources and energy efficiency opportunities, promote energy-related economic development, and open new energy technology markets for businesses;
- Catalyzing planning and investment in grid modernization and pipeline expansion efforts;
- Assisting small- and medium-sized manufacturers in increasing energy efficiency to improve competitiveness and support business incubators;
- Incentivizing private-sector businesses to work with homeowners (e.g., home energy efficiency measures) and local governments (e.g., public facility retrofits) to implement energy efficiency measures that save families and taxpayers money; and
- Establishing public-private energy efficiency financing partnerships (e.g., revolving loans, utility on-bill programs, energy savings performance contracting) that leverage private sector expertise and delivery capabilities. In every case, these financing programs are aimed at bridging market gaps and transitioning to private sector financing solutions that support new energy technology markets in such areas as high performance commercial and residential buildings, advanced materials for manufacturing, and new electric grid and distributed energy technologies.

We look forward to working with this Committee to ensure that the WAP statute reflects 21st century options and best practices, with a commitment to quality workmanship, credentialing and standards for all aspects of the weatherization program. Weatherization provides the foundation for residential clean energy investments that create jobs, increase American competitiveness, saves families and businesses money through improved energy efficiency, and reduce pollution. The Weatherization Assistance Program has helped low-income families, seniors, veterans, and individuals with disabilities make lasting and cost-effective energy efficiency improvements to their homes. A total of 7.4 million homes have been weatherized by the program since its inception in 1976. There are more than seven thousand highly skilled jobs in the weatherization network, with countless more supported in related business supply chains, including materials suppliers, vendors, and manufacturers. Weatherization, through the supply chain, is a significant contributor to the economy, and has supported the construction industry and given a boost to American manufacturers and small businesses during challenging economic times. Reauthorization by Congress and reaffirming the Federal government's support for the Weatherization Program is key to sustaining its future.

Together with NASCSP, we urge the Committee to reauthorize these programs and help to ensure that states have the resources to continue to support the benefits we have just mentioned for SEP and WAP.

**Alaska Efforts:**

In Alaska we appreciate the flexibility of the SEP funds as it advances the state goal to improve statewide energy efficiency by 15 percent by 2020. The Alaska Energy Authority (AEA) shares SEP funds with our sister authority, the Alaska Housing Finance Corporation (AHFC).

AEA has used a portion of the SEP funds to leverage state funding for the Village Energy Efficiency Program (VEEP). This program provides grants and technical assistance to remote, high cost communities for energy audits, planning and implementation of energy efficiency measures in community buildings and infrastructure. Past iterations of this program have yielded impressive results with average payback periods of three years, and typical annual energy savings of 30 percent (electric and space heat). SEP funds support important site visits, community education and outreach and multi-agency planning and coordination. This multi-agency coordination and community involvement is critical in remote Alaska villages where fuel oil prices may be \$8 to \$9 a gallon.

Formula SEP funds help support energy efficiency community engagement, education and outreach throughout Alaska. Funds have been particularly helpful in facilitating state participation in the DOE Tribal Strategic Technical Assistance Response Team (START) program. START identifies five villages each year to provide assistance in planning, technology and opportunity assessment and project development. With SEP funds, AEA staff can insure that our small rural villages are taking full advantage of the energy efficiency opportunities available to them.

Formula SEP funds also support Alaska's statewide efficiency outreach and education efforts including management of the Alaska Energy Efficiency Partnership (the Partnership). The Partnership is a group of more than 40 energy efficiency stakeholders including government entities (state, local, tribal and school districts), utilities, advocacy groups and private sector service providers.

AEA also uses SEP funds to facilitate efficiency projects with private commercial property owners and the lenders who serve them. This is an important and underserved market with significant potential efficiency savings for rural communities in Alaska.

SEP-assisted programs help pay for outreach and education material development, as well as work with this important building sector. This outreach effort is leveraged with state funds that pay for ASHRAE level II audits for private commercial buildings.

The AHFC uses their portion of the SEP funds to support a residential energy efficiency program. To date, the Alaska Legislature has provided \$350 million dollars to fund this effort.

Many other states utilize SEP as seed money to develop and implement much larger programs with non-Federal funding. In Alaska, this program provides grants to homeowners to have an energy audit done on homes. Based on the recommendations of the audit, the homeowner can then qualify for a direct cash rebate of up to \$10,000 to reimburse for energy efficiency upgrades performed on the home. As of January 2015, improvements have been made to approximately 16,000 homes. The average homeowner spent \$11,681 and qualified for a rebate of \$6,889. The improvements generally resulted in a yearly energy savings of 34 percent, or cash savings of \$1,464. The AEA and AHFC SEP programs cover the majority of the state's energy efficiency efforts.

**1. Building Energy Efficiency Standard (BEES)**

Meeting the Alaska Building Energy Efficiency Standard (BEES) is required for all new residential homes built since 1992 and community-owned buildings receiving AHFC financing. AHFC is responsible for the BEES, provides technical assistance, and maintains a list of individuals who may verify compliance with the BEES. On April 3, 2013 AHFC adopted the 2012 International Energy Conservation Code (IECC) with Alaska Specific Amendments as our BEES. Alaska Specific Amendments include an additional two climate zones among other amendments, which generally make the BEES slightly more stringent than the 2012 IECC.

**2. AKWarm Energy Modeling Software**

The AkWarm<sup>®</sup> software used by AHFC since 1996 is an integral part of AHFC's energy programs and financing. AkWarm is specifically designed for Alaska. It uses a wide range of weather data from across the state and its fuel and utility costs are updated regularly. AkWarm is free and is the preferred energy modeling software in the state. Only AHFC authorized energy raters may issue an official energy rating, but anyone is able to visit our website and download the software. A light Commercial AKWarm exists as well.

**3. Alaska Retrofit Information System (ARIS)**

ARIS is a database managed by AHFC that contains detailed information and characteristics of both residential and commercial buildings across Alaska. Every time an energy rating is completed in the state, that housing information is uploaded to the ARIS database. Today, the database has about 75,000 unique housing records. This data allows program staff and researchers the ability to answer a variety of questions not only about the housing characteristics, but energy end use and program effectiveness. With the development of AKWarm – Commercial, ARIS is able to track energy use in public facilities and commercial buildings as well. In fact, all state buildings are using the ARIS database to track energy use, as required by 2010 legislation.

**4. Building Monitoring**

Primarily funded with SEP, a Building Monitoring System was developed to manage building energy use in real time. The System includes both software and hardware needed to monitor and analyze a building's energy use. The goals of the Building Monitoring project are to discover where energy savings can be made and to create a guideline manual for future building monitoring. It is also the hope of this project to engage

operators to be more aware of energy costs related to the way they operate their buildings and to provide them with the tools needed to manage building energy consumption.

Examples of other states' successful projects and programs, which utilized SEP funds and substantial leverage of non-federal funds in collaboration with private sector and state and local government partners is included at the end of my testimony.

In addition to our support for the reauthorization of SEP and WAP (S. 703), NASEO also strongly supports the following bills:

**The Energy Savings and Industrial Competitiveness Act of 2015 (S.720)**

NASEO continues to support the energy efficiency bill primarily sponsored by Senators Portman and Shaheen. This forward-looking legislation addresses a wide variety of efficiency opportunities, ranging from building energy codes to federal building performance. While we appreciated the fact that S. 535 was passed by both the House and Senate and addressed grid-integrated water heaters, "Tenant Star" and other limited building efficiency opportunities, it will deliver on only a small part of efficiency's huge potential. We supported passage of S. 535.

**The Energy Savings Through Public-Private Partnerships Act of 2015 (S. 858)**

NASEO has long supported Energy Service Performance Contracts (ESPCs). Senators Gardner, Coons, Portman and Shaheen should be congratulated for introducing this bill to promote expanded use of energy and water efficiency measures in Federal buildings. The industry develops approximately \$7 billion in projects annually, mostly in government buildings and in strong cooperation with the state energy offices. Most of these projects are in state, local and school buildings. We are coordinating the Federal and state programs to reduce duplication and improve use of best practices.

**Energy Productivity Innovation Challenge Act of 2015 (EPIC) (S. 893)**

Senator Warner and Senator Manchin have reintroduced an excellent bill. EPIC is originally based on a commission report under the auspices of the Alliance to Save Energy. The objective is to double the productivity of national electricity use by 2030 by fostering new approaches. Again, the bill recognizes the value of the Federal government and states working together, rather than working at cross-purposes. These two former Governors put a structure in place under the bill that would allow up to 25 states to receive funding to implement plans to increase energy productivity. Depending on the success of those efforts, after 18 months, a second round of funding would be provided to up to 6 states with the best performance. We believe that supporting and rewarding state leadership on energy efficiency is a creative and appropriate role for the Federal government and we give it our full support.

**The Residential Energy Savings Act (S. 878)**

Senators Sanders, Cantwell, Wyden, King, Whitehouse, Markey, and Franken, and last year, Senator Murkowski, put forth an excellent bill focused on residential energy efficiency

upgrades. This innovative bill would provide a loan from the Federal government to the states who would, in turn, set up voluntary programs to loan money to residential consumers for energy efficiency upgrades. It is intended to be complementary to the Weatherization Assistance Program, by going beyond low-income households to offer financing to all residential consumers. We expect that the thoughtful approach taken in this bill will overcome the challenges that have hindered progress in residential sector efficiency.

#### **The PREPARE Act (S. 888)**

Senator Schatz and Senator Heinrich are also to be applauded by introducing the PREPARE Act. This bill is based on successful cooperative planning initiatives undertaken in Hawaii and through the State Energy Program across the country. It calls for the development of regional energy partnerships (or sole state efforts in Hawaii and Alaska), focused on integrating investments in infrastructure, technology, innovation, public-private partnerships and energy system modernization. System resiliency is also a critical objective. Far too often, our energy system has been seen as separate stovepipes without a proper understanding of interdependencies and impacts, both intended and unintended. The bill calls for the development of cooperative agreements between the states or regions and the U.S. Department of Energy to bring its substantial technical expertise and experience to bear on state and regional challenges.

#### **Energy Retrofitting Assistance to Schools (S. 523)**

NASEO supports efforts to improve the energy efficiency of schools. In fact, states and local governments have been working with school districts in this area for decades. Unfortunately, funding for the Institutional Conservation Program (ICP) (42 U.S.C. §6371), which included funding for states to implement these activities with schools, has not been appropriated for approximately two decades. We support the efforts contained in this bill introduced by Senators Collins, Warner, Ayotte and Merkley. We also pledge our continued assistance (see Subsection 1(c)(2)(B)).

#### **Examples of States' Successful Programs Utilizing SEP:**

The states have implemented thousands of energy efficiency programs and projects. Following are a few representative examples.

**Alabama:** Through SEP-funded training workshops and webinars provided by the Alabama Department of Economic and Community Affairs' Energy Division, state agency staff was trained on utilization of no-cost building energy efficiency practices. As a result, Alabama state government agencies took steps that reduced utility bills in state-owned buildings by \$7.4 million in the first two years; 37 percent above the goal of \$5.4 million.

**Arizona:** SEP funds are supporting energy efficiency improvements in 33 school districts statewide. The School Energy Efficiency Program, administered in conjunction with the Arizona School Facility Board, provided grants covering up to 30 percent of project costs with the school district responsible for the remaining 70 percent either through an energy performance contract or utilizing bonds. Under the program, Higley Unified School District funded lighting, controls

and HVAC upgrades in four schools. For one school, these energy measures have translated into an annual savings of \$153,855 – nearly 30 percent on its utility bill. The energy savings will pay the school’s share of their energy performance contract in seven years.

**California:** SEP contributes substantially to a number of energy efficiency initiatives in California. The State Property Revolving Loan Fund Program is supporting energy upgrades in more than 60 buildings located throughout the state. The Municipal and Commercial Building Targeted Measure Retrofit (MCR) program has provided energy audits and energy efficiency improvements at non-residential buildings in California. MCR installations at over 7,400 project sites in California are estimated to realize over 85.8 GWh in electricity savings, 8.6 MW in demand reductions, and 950,000 therms in natural gas savings.

**Colorado:** Since the mid-1990s, 143 public jurisdictions have worked with an energy services company (ESCO) to identify \$29 million in annual utility savings through a technical energy audit through Colorado’s Energy Performance Contracting Program. Because each technical energy audit is high-quality, “investment-grade,” those guaranteed utility savings have been leveraged to attract \$447 million in capital construction funds. As of June 2014, 182 active and completed projects have improved the performance of public school and university buildings, veterans facilities, libraries, parks, market community centers, wastewater treatment plants, prisons and other government buildings in communities across 75 percent of Colorado’s counties.

**Delaware:** The Energy Efficiency Investment Fund utilizes \$5 million of state funds on an annual basis to provide incentives to help commercial and industrial customers install high efficiency natural gas heating and water heating equipment, energy efficient lighting and lighting control improvements, and vending improvements. In addition, an SEP-supported revolving loan fund offers low-interest loans that encourage borrowers to adopt and install energy efficiency measures that, in turn, lower their bills.

**Hawaii:** The state implemented public building energy retrofits and solar projects, which exceed \$40 million in energy cost savings and 98,900 MWh of guaranteed energy savings annually. Hawaii is in the midst of a major energy transformation, including the interconnection of approximately 50,000 solar photovoltaic systems on residences.

**Idaho:** The Idaho Office of Energy Resources (OER) is working with rural cities and counties that want to save energy in existing public buildings; seven approved applicants will receive energy audits on a total of 13 city or county buildings, and OER is working with the audit recipients to provide cost-share funding on energy efficient retrofits identified in the energy audit.

**Illinois:** SEP funds were utilized to continue Illinois’ emergency planning, advancing a Clean Energy Tech Fund, and operating the Innovative Energy Program (IEP) initiative. The IEP targets cutting-edge efficiency projects and integrating advanced battery storage. IEP has funded a number of projects, such as the Continental Electric Energy Storage pilot, which includes installation of a 53kW solar PV array along with a 114kW battery energy storage system.

**Kentucky:** The Kentucky Department of Energy Development and Independence helps teams of designers, architects, and school administrators develop and construct cost-effective zero-net energy capable schools. The energy use reductions and cost savings have been dramatic. The training and assistance efforts, accomplished through SEP funding, played a pivotal role in helping Kentucky pursue and achieve its market transformation goals.

**Louisiana:** In Louisiana, the state energy office in coordination with Entergy has invested \$14.7 million in 61 energy efficiency improvements that has resulted in \$30 million in annual fuel savings. The SEP program has also supported their Home Energy Rebate Option Program (HERO), which has resulted in over 1,100 home retrofits and a 30% average increase in energy efficiency per home and nearly 47,000 MMBtu in total annual energy savings in all homes completed.

**Maine:** SEP funds supported Maine's Home Energy Savings Program, which launched in 2010. To date, approximately 5,000 Mainers have conducted residential energy audits with at least 3,000 of these homeowners receiving rebates for whole-house energy upgrades. More than 100 licensed construction companies have been certified to participate in the program, which has resulted in excess of \$27 million worth of residential energy retrofit projects.

**Massachusetts:** The Commonwealth's solar incentive program, launched earlier this year, is having the desired effect of stimulating Massachusetts' economy. In addition to putting people back to work it is also changing the state's energy future. Administered through the Massachusetts Clean Energy Center (CEC), the solar rebate program is funded through SEP. Capitalized with \$8 million, the program has leveraged \$32 million in outside capital that has triggered the construction of eight megawatts of new solar photovoltaic capacity at 100 sites around the Commonwealth.

**Michigan:** The Michigan Energy Office (MEO) invests nearly all of its SEP appropriation and energy revolving loan funds on projects that focus on communities, clean energy manufacturing, and implementing energy policies. MEO has invested in development of best energy practices and placement of Community Energy Managers in communities to help reduce energy waste and to improve energy efficiency in public buildings to free up budgets for re-investment in local priorities. Incentives for retooling, advanced manufacturing, and development of clean energy technologies are provided annually to small business. MEO is also engaged with key partners to create a roadmap for implementing Michigan's new energy policies that will result in an affordable, reliable, and a sustainable energy portfolio for Michigan.

**Minnesota:** Project ReEnergize, Minnesota's energy efficiency rebate program designed to save homeowners energy and money and create jobs in the residential construction industry, was so successful that it's been called a model for other proposed federal SEP projects, including the Home Star program. Project ReEnergize was the \$3 million SEP-funded program administered by the Builders Association of Minnesota on behalf of the Minnesota Department of Commerce (the state energy office). The program included half-day training for qualified licensed contractors and issued average rebates of \$2,200 to about 1,200 homeowners. The average cost per home improvement project was \$13,700. For every \$1 in rebate money provided, consumers spent \$5 upgrading their homes with energy efficiency improvements.

**Mississippi:** SEP funds were utilized to support several programs aimed at reducing energy consumption and costs in public buildings. The Energy Division partnered with the Mississippi Department of Finance and Administration to implement a "Lead by Example" program which, to date, has conducted 278 building audits. The public buildings program is helping to finance energy-saving upgrades through ESPCs at 10 public institutions. Under the program, 149 public buildings, representing more than 3 million square feet of space, have been completed.

**Montana:** Montana's Alternative Energy Revolving Loan Program was expanded using SEP funds and provides a financing option to Montana homeowners, small businesses, non-profits, and government entities to install alternative energy systems. Funds are paid back to the program and loaned out again, extending the funding benefits for years. Loans are capped at \$40,000 and carry a 3.25 percent interest rate (rate adjusted annually) with terms of up to 10 years. For example, in 2013 the Renewable Energy program coordinated and provided assistance to F.H. Stoltze Land Lumber located in Columbia Falls on the first 5 MW biomass cogeneration installed in the State.

**New Hampshire:** The New Hampshire Green Launching Pad – a new public-private partnership between the Governor's Office, the Office of Energy and Planning, and the University of New Hampshire – funds state businesses in the clean tech sector. Funded through SEP, the Green Launching Pad is an investment in the future of New Hampshire business. The success of the program's first round is best described by the turnout. The Board planned to distribute around \$90,000 to each of three winning teams. Instead, of the more than 70 teams that applied, five teams each received between \$20,000 and \$60,000.

**New Mexico:** Among New Mexico's recent energy efficiency successes using SEP funding, is a traffic light project launched in 2009. In partnership with the New Mexico Department of Transportation, this project used SEP funding to convert 355 traffic signals in 33 communities from incandescent lamps to light-emitting diode (LED) lamps. After one year in operation, the LED program has resulted in a 75 percent energy savings and a 67 percent cost savings.

**North Dakota:** \$2.4 million from SEP was allocated to the energy efficiency rebate program to provide rebates through utility partners for high efficiency furnaces, air conditioners, lighting retrofits, thermal storage, and insulation packages. The rebate is unrelated to the state's ENERGY STAR Appliance Rebate, which rebated \$615,000 in five weeks.

**Oklahoma:** The Tulsa Public Schools used SEP funding, and a combination of federal and state tax credits, to convert its entire fleet of 177 diesel-powered buses to compressed natural gas. The SEP funds were provided in the form of a grant through the Oklahoma Department of Commerce (the state energy office). Once all buses are converted the school district expects to save between \$750,000 and \$1 million annually on fuel costs.

**Ohio:** SEP has funded many initiatives to help Ohio small businesses reduce operating costs and improve their competitiveness. The Council for Smaller Enterprises (COSE) is providing small businesses with access to educational and financial resources for energy improvements, and utilizing online tools from the state and Federal agencies to help track the companies' sustainability and energy efficiency. The

Building Operator Certification is a professional certification program, sponsored in part by OERD, which is improving the effectiveness of energy efficiency programs.

**Oregon:** Funded in part by SEP, the Oregon Department of Energy's (ODOE) umbrella Public Buildings Program includes the State Energy Efficiency Design (SEED) Program. The SEED program will save almost \$1.4 million this year in energy costs, according to a new report from ODOE. Under the SEED program, agencies have reduced energy use in state buildings by more than 20 percent, meeting energy reduction targets more than two years ahead of schedule. The goal for all of state-owned buildings was to reduce overall energy use by 20 percent by the end of 2015 compared to a baseline year of 2000. The goal was achieved in 2012 and continuous improvements have led to a combined energy reduction of 22.4 percent.

**South Carolina:** During the past two years, a public building energy retrofit program in South Carolina, using SEP funds, has resulted in energy efficiency improvements in 579 buildings statewide. The buildings represent nearly 21 million sq. ft. of space and include 32 two/four-year colleges, 22 state agencies and 85 school districts. All measures funded through the program's grants and loans have a minimum return on investment of at least 2.5 to 1.

**Tennessee:** The Tennessee State Energy Office oversees the contribution to the Pathway Lending Energy Efficiency Loan Program, a public-private \$35 million revolving loan fund established by the state, TVA, Pinnacle Bank, and Pathway Lending in 2010 to benefit businesses and industry. The state and other partners hope to expand the program to local governments and quasi-governmental entities by spring 2015. The state is instituting a new EmPower Tennessee program to target reductions in state utility bill spending by 28%.

**Utah:** SEP funding was leveraged to establish the Utah Home Performance Program (UHP) – a residential energy efficiency rebate program to build the infrastructure and a permanent workforce for a “whole home” retrofit market. Starting in 2010 with a budget of \$4.5 million, UHP achieved the following: an average of 29 percent energy savings per home (initial goal was 20 percent); a network of 85 UHP approved companies, creating 130 jobs; leveraged \$7.5 million in residential energy efficiency retrofits; and retrofitted 1,250 homes (initial goal was 758).

**Vermont:** Thanks to a SEP-funded \$50,000 grant and \$500,000 loan from the Vermont Clean Energy Development Fund (CEDF), the 425-acre Auburn Star farm will soon be home to a digester designed to produce biogas from farm waste. The gas will then be used to generate electricity – offsetting both the energy purchased by the farm and the waste to be disposed of. The CEDF received proposals from thirty-two different projects requesting over \$7 million in financial assistance. In all, more than \$3.3 million was distributed across the state.

**Washington:** The Washington Department of Commerce selected a local company's plan for the Pasco area canal for funding from SEP. A grant in the amount of \$898,175 was awarded to the project developers, Green Energy Today, of Kennewick, Washington. The grant is one of thirty-six grants funded through the Energy Efficiency and Renewable Energy Grant and Loan Program offered by the Department's State Energy Office.

**West Virginia:** Among the SEP-funded initiatives are several programs that emphasize improving energy efficiency in public buildings as a way to reduce energy costs to taxpayers. The initiatives focus on nine departments within state government including Corrections, Higher Education, K-12, National Guard, Health and Human Resources, Environmental Protection, Natural Resources, and Agriculture and Administration. A \$2.1 million project administered by the West Virginia Division of Energy and funded by the SEP will reduce annual operating costs for West Virginia's most expensive facility to heat by more than \$400,000 per year. The project will pay for itself within five years.

**Wyoming:** SEP funding has been vital as the state energy office works to further efforts in the residential market, business, industry, local, and state government. SEP funds provide program support for a variety of activities that include a Facility Building Retrofit Program, a K-12 Facility Retrofit and Renewable Demonstration Program, and a Residential Renewable Energy Grant Program. Since 1999, Wyoming residents have benefited from renewable incentive grants through the state energy office. During the last two decades, more than 400 incentives have been issued. Cost and generation data on recent installations is being collected and will provide valuable analytics on outcomes. The renewable systems include nine ground source heat pumps, as well as 75 photovoltaic and 144 small wind systems with the generating capacity on those systems totaling over 657 kilowatt (kW).

#### **Energy Efficiency Legislation that Should be Changed**

While we have not taken a position on all the bills before the Committee, we believe S. 939, intending to evaluate and avoid duplication in "green buildings" programs, should be modified. S. 939 will impose an administrative burden on states and local governments, as well as DOE. As we read the GAO report referenced in the legislation, the key recommendation is to enhance coordination among programs, not to presume duplication is occurring. Since some state programs appear to have made the list, we want to urge the Committee and the sponsors of the bill to work with the states and DOE. For example, "administrative expenses" are already defined in the SEP and WAP regulations. Subsection 1(a) of the bill will cause additional work. Since the states operate hundreds of programs and have implemented tens of thousands of projects, we are not interested in pursuing an expedition on defining "service" under the proposed bill (Subsection (1)(a)(4)). Again, the report required in the bill will necessitate DOE contacting the states for much of this information. We hope to be able to work with the Committee and the bill's sponsors to identify both programs that work and programs that could be enhanced with greater coordination. An option the Committee may wish to consider is a request for an interagency task force to address these issues.

#### **Conclusion**

Thank you for the opportunity to testify today. I am prepared to answer any questions.

The CHAIRMAN. Thank you, Mr. Therriault, I appreciate your comments and your good work not only in the state but on behalf of the Association of State Energy Officials. Appreciate the work.

I think we recognize that we have no shortage of programs out there that are designed to address some of the efficiencies whether it is on the state side or whether it is on the Federal side. I think this has been some of the concern we have heard is how do you know even where to access? You mentioned collaboration. We need to streamline. I think these are areas where we would all agree we have got some work to do.

Some of the bills that we are looking at, such as the proposals to impose a national energy efficiency resource standard, would result in Federal programs that resemble, somewhat, what we have in place at the state level. So this is a question to anyone who would care to engage.

If the states are successfully implementing these types of programs should we, at the Federal level, be duplicating or overruling their efforts or decisions with a Federal overlay?

We talk a lot about giving flexibility to the states, and certainly we want to do what we can from a broader perspective to encourage these efficiencies, but are we in a situation now where we are not giving the flexibility to the states that we need? And instead working at your end of the spectrum, Dr. Hogan, in an overlay of Federal policies that may just further complicate matters?

I will ask both you, Dr. Hogan and you, Mr. Therriault, from the states' perspective and the Federal perspective. How do we deal with this? Because I think this is part of our required review of not only what we have with these 22 bills, but how we bring about efficiency within our processes so that we make sure that the programs are working.

Dr. Hogan, why don't you begin?

Dr. HOGAN. So I think there is, clearly, a lot more opportunity for what we can do with energy efficiency. As you point out it does require, sort of, an effective collaboration across the Federal, state and local entities as well as engagement with the private sector.

I think your question was specifically around, sort of, energy efficiency resource standards as one tool to do that, and you were pointing out that many states are doing this.

And I think what's interesting is when you look at the states that are doing this the benefits that they are getting from their approaches are quite significant. And they are showing that they can do it quite cost effectively. And then at the same time when you look around the country you see that other states have a similar opportunity for energy efficiency but really haven't figured out how to get organized in a way to go and capture as much of it as the states that are pursuing the energy efficiency resource standards are.

The CHAIRMAN. But then if we require that then we lose some of the flexibility that Mr. Therriault has suggested is imperative. Can you speak to that?

Mr. THERRIAULT. Yes. First of all, NASEO, the organization has not taken an official stance on energy efficiency resource standards.

I think to the general comment or the question, we certainly do not want the Federal programs structured that duplicate the state

efforts. We really are looking for legislation that has a partnership with states.

In the State of Alaska the work that's being done by the Cold Climate Housing Resource Center, the Alaska Center for Energy and Power, have done a lot of work and quite often there is a little bit of a dance that goes on between those state entities and the Federal entities to encourage them to partner with the state entities to maybe take the work to the next standard. There may be a need to assist and partner with the Federal, the state agencies, to achieve more.

But anything that you can do to prevent the Federal legislation from just being a duplication of what's going on in so many of the states would be most welcome.

The CHAIRMAN. It is going to require critical review.

Mr. Nadel.

Mr. NADEL. Yes, just briefly.

The bill, the EERS bill, actually does call for the states to administer them. There are quite a few provisions in there to let the states have quite a bit of flexibility in terms of interpretation. I think it is an example of a bill where sometimes something one or in this case half the states are doing that could benefit the country. And therefore, I'd recommend considering it while recognizing some of the concerns that you are expressing.

The CHAIRMAN. Understood. I appreciate it.

Senator Cantwell.

Senator CANTWELL. Thank you, Madam Chair.

There are a lot of companies from the northwest, I think some of them are here today, Itron, Microsoft, Ellstrom, McKinstry, who are leaders in smart building acceleration. And so I wanted to ask you, Mr. Nadel and you, Dr. Hogan, about do you see new monitoring and control technologies as another step in incremental improvements in energy efficiency or are they likely to be game changers, you know, on a whole, in a sense of a whole new set of opportunities?

Second, much of the technology needed to make buildings smarter is commercially available but development is slow. What do you think are some of the barriers to increasing that level of deployment?

Either you, Mr. Nadel, or Dr. Hogan.

Mr. NADEL. Okay, I will start. I would lean towards saying that smart building technology is also smart manufacturing technologies are more game changers. They take advantage of the information communication technologies that we all know and now carry in our pockets and have all throughout our homes and get information to us or to automatic controls to really, much better, recognize energy waste in real time and control it.

We're finding energy savings of 15 to even 50 percent, depending on the application people are using. So it is much more than incremental.

I'd also note that it makes possible a new set of programs where you can start much better monitoring the energy savings in real time and pay for performance rather than just pay as a percent of how much it costs or what you think it may get. So I do see these as game changers.

I think, to pick up on your second question, consumers are not investing in these yet. They're relatively new. They do not know about them. They're improving. They're not sure they trust them.

So I appreciate the fact that your bill, S. 1046, would set up a number of programs, do case studies, work with the Federal Government so we can both save energy, but use the Federal case studies to demonstrate to other people what is possible would help leverage other programs such as DOE's Better Building Challenge to help promote smart building technologies as well as leverage our national labs and have them do applied R and D where it is needed to address particular barriers.

So these are the types of things that need to happen with any good energy saving measure, but smart buildings included.

Senator CANTWELL. Dr. Hogan?

Dr. HOGAN. And at the Department we look at the opportunities for smart buildings and I'll take the opportunity to extend that to smart manufacturing as well as game changers. Sort of a new generation of low cost sensors that give you the opportunity to take advantage of the equipment that you may already have and really make it work at optimum performance offers huge opportunities for energy savings in a very low cost way.

And certainly we are doing a lot of that work through a number of the national laboratories right now including up in the Pacific Northwest. And we are very excited about what is going on.

I think some of the barriers include that we need a next step in some of the low cost sensors, really making them as low cost as they can be as well as some improvements in the communication protocols and, sort of, the interoperability of things. And again, road maps that we are working to develop at the Department and really look forward to putting to work and would look forward to working with you on a bill that can really help make this happen.

Senator CANTWELL. Thank you.

Mr. Crasi, you look like you had something to say and, Mr. Therriault, I do not know if you have any thoughts about building performance issues or particular projects that you think might be targets for this kind of thing?

Mr. Crasi.

Mr. CRASI. Yes, Ma'am. Thanks for the opportunity.

Here in Washington with the National Association of Home Builders, I've been involved with the technology of home automation and the progression I've watched over the last, say, six or seven years. And what we find is one of the most sought after items in technology is a smart home that controls your heating, cooling, your energy output.

And I think it is a wonderful opportunity and it doesn't need to be expensive. And you had asked about the barriers and that's what caught my attention is one of the big barriers are, is, the lack of a consistent platform across all the different manufacturers. And once you solve that problem all the systems start to talk to each other because there's a huge reluctance.

Somebody had just mentioned the reluctance of consumers to jump in it is because what happens is you have conflicts between the different systems. And they get frustrated and they stop using them.

But we, I am part of a nonprofit that produces very affordable housing. And to prove a point, I got one of the national guys involved and he put in, for \$1,500, he put in an entire system in a \$100,000 home that controlled the heating, it controlled the lighting. It controlled security, everything. Just to prove a point, it can be done. But if you ask about those barriers, one of the biggest barriers is getting those platforms to work with each other.

Senator CANTWELL. Well, we would like to see that house, but interoperability is a big issue. The reason I am asking this question is because 40 percent of our energy use is in buildings and so if you key in on this then you can get some of these savings that you are talking about, 15 to 50 percent. That is pretty big.

I know our time is expired, but maybe you could, for the record, tell us some of the things that might be helpful in Alaska.

Mr. THERRIAULT. Certainly, through the Chair.

Certainly in Alaska where the space heat really is the critically energy demand on a yearly basis for commercial buildings and residential. And so being able to have the systems in any building work with each other to get maximum efficiency is ideal.

I think, Madam Chairman, that's one of the areas that, again, the Cold Climate Housing Research Center at the University of Alaska is looking at ways to bring the latest technology into the northern application and make it work as best as possible.

One of the things that we have to continually keep a focus on though is making it as simple as possible. When you are talking about taking technology and putting it out into a very small village and having it where it can be maintained, understood, fully utilized, it has to be not only cost effective, but also something that is easily understood. And so that's one of the things that I think, again, some of our local research would be good information back to the industry that is developing this to make it so that it is really inherently useable in a situation like the State of Alaska.

The CHAIRMAN. Senator Flake.

Senator FLAKE. Thank you. Thank you for the testimony.

Let me begin talking about a bill that I have introduced with Senator Booker. It is S. 939. It responds to the GAO study, a recommendation that Federal agencies evaluate the 94 green building programs that span 11 Federal agencies to try to determine if there are opportunities for consolidation and reducing duplication.

I want to thank Senator Portman for joining me in an amendment that we had through budget resolution, amendment number 822 which also provides for a reduction in duplicative programs.

I think when GAO, which is obviously a nonpartisan, independent agency, provides a recommendation on how government can become more efficient we ought to take heed and we need to look hard at these recommendations. In this case GAO made the recommendation in 2012. This legislation I have introduced with Senator Booker would make just a very modest step to ensure that these recommendations are considered.

But to Dr. Hogan, can you talk a little about DOE's capability to evaluate these green building programs and to identify areas that might—areas for consolidation or improvement?

Dr. HOGAN. Certainly.

The Department of Energy has capabilities to look at programs. I think the Administration, sort of, more broadly has approaches to ensure that the programs across the Federal Government are well coordinated.

I mean, I think I can also speak to the programs that we run at the Department. I think most of the ones that are in your amendment that are within the Department actually reside under me. So I think I can speak quite well to how well and how committed we are to ensure these are effectively coordinated and that they do have separate but complementary missions that are all doing what it is they are supposed to do with the Federal taxpayer dollar.

Senator FLAKE. 94 green building programs scattered across 11 agencies. My guess is that GAO is right that we need to consolidate and eliminate duplication here.

Dr. HOGAN. Well, what I would love to do is first, perhaps, start with the Department's programs and come up and show you and/or your staff, sort of how we are strategically orienting the programs that we have to meet sort of the missions they have and how they complement each other.

Senator FLAKE. Well, thank you. We would appreciate that. And do you have any thoughts on the other agencies? Are they as proactive as you are? I know most of them reside under your agency, but—

Dr. HOGAN. I think I do not know the number. It sort of depends on how you count here.

You know, a fair number of them are under the Department of Energy. But certainly there are programs.

But, you know, I am happy to engage in a conversation with everything that we know with you and your staff about the programs as we look at that GAO chart and how they complement each other.

Senator FLAKE. Alright, I appreciate that.

Mr. Nadel, I want to ask you about Section 433 of S. 720. In this section the HUD Secretary is directed to issue underwriting guidelines to require banks to adjust the mortgage applicant's income and artificially increase the appraised value of the property based on the predicted energy cost savings, the so called SAVE Act. Especially in light of the financial crisis we had in 2008 which was partly a result, I think, of us trying to meddle in underwriting standards.

Do you have some concerns about this? Do we really understand the mortgage markets enough to try to mandate and artificially increase or increase appraisal values when the market isn't doing it?

Mr. NADEL. Okay. Yes, we do support this bill. I noticed that NAHB also noted that they support this bill. We think there is a lot of good data indicating that if you reduce the energy use and therefore if you have more money in the homeowner's pocket, they can afford a larger mortgage. There, in fact, are a number of independent studies showing that the default rates are lower for highly efficient homes than less efficient homes.

We certainly recognize you have to be very careful with the underwriting standard, and we are only supporting this bill and advo-

cating it along with NAHB and the realtors and others because there is a good, firm basis of empirical evidence that this can work.

Senator FLAKE. Well, you were referencing one study. I know there is one study that indicates the default risks are lower in energy efficient homes. This was conducted by the Institute for Market Transformation, a DC-based, nonprofit, dedicated at promoting energy efficiency.

I am not entirely sure that we ought to rely on one study like this when the markets, I mean, we are basically saying the markets are not recognizing this. We are going to tell the markets what to recognize. I always get scared when government does that. I think there is history, that cautions us in doing that. Does anybody have any caution there?

Mr. Gayer, you are an economist or do you dabble in that kind of area? Do you have any caution there?

Dr. GAYER. Caution on what in particular?

Senator FLAKE. In terms of telling the agencies that deal with these home loans to artificially increase the appraisal value of the house or change the underwriting standards to account for more energy efficient homes.

Dr. GAYER. I do not know the specifics of it, but certainly when you are changing the appraisal and underwriting we've all learned the lessons of what weak underwriting can accomplish for the economy since 2008.

Senator FLAKE. Well, that is my concern as well, and I hope we will be careful moving ahead and base this on more than just a study by a one nonprofit organization. I think the markets are typically smarter than we are here, and if they do not recognize the value, we need to be careful in trying to assign a value to this. So that is my concern. Thank you.

The CHAIRMAN. Thank you, Senator.

Senator Franken.

Senator FRANKEN. Thank you, Madam Chair.

I want to revisit the energy efficiency resource standard because I think it is the way that we can most effectively reduce our energy use. 24 states, including my state of Minnesota, have already adopted the Energy Efficiency Resource Standards which require electricity and natural gas utilities become a little more efficient each year. That is 24 states. Scientists tell us that is almost half our states. [Laughter.]

If we adopt a similar standard at the Federal level we would unleash the manufacturing and deployment of all kinds of energy efficient products throughout the economy and that would reduce not only our energy use, but also people's electricity bills across the country. I am a supporter and co-sponsor of Shaheen/Portman, but since the Committee is now looking to do a comprehensive energy bill we need to have a conversation about what comprehensive energy efficiency looks like, and I believe that a central piece of that is the energy efficiency resource standard. I want to thank the Ranking Member for mentioning it and thank the Chair for bringing it up for discussion in her questions.

Mr. Nadel, it is actually kind of remarkable that while Congress has been sitting on the sidelines about half our states have imple-

mented energy efficiency standards. Can you give us a broad overview of how these programs are working across the nation?

Mr. NADEL. They generally are working very well. Basically the states have set their goals. They typically increase gradually over time. The utilities then offer energy efficiency programs to their customers whether they are homeowners or businesses to help them to improve energy efficiency.

It's technical assistance. It's helping to improve stocking of efficient products. Sometimes it will be financial incentives to pay a small portion of the cost to make it more attractive so the customers then buy those measures.

But we've done an evaluation of those studies. And on average all of the states are exceeding the targets. Many times they are saving more than the target's mandate, and they are doing so very cost effectively. Typically benefit cost ratio for these utility programs are two to one or even three to one.

Senator FRANKEN. To me this is a perfect example of the states as laboratories, as the founders really envisioned. And the laboratory has got a positive. [Laughter.]

You know, eureka, they were saying on all these states.

Dr. Hogan, would you agree that these are working at the states, the state level?

Dr. HOGAN. Yes, from everything we have looked at we see great results coming from the efforts of the states in this area.

Senator FRANKEN. So and your organization has estimated the energy savings. What would we see if this were adopted as outlined in my new bill, S. 1063, as they compare to all of Shaheen or Portman/Shahen?

Mr. NADEL. Right. We analyzed both of them in 2013. In 2013 we found the savings from your bill, the ERS was about three times what Shaheen/Portman would save. We would like them both. We like the total of—

Senator FRANKEN. So instead of 22,000,000 cars off the road, with this there would be 88 together?

Mr. NADEL. Yes, about. And very large financial savings, we estimate net savings to consumers and businesses would be over \$125 billion as a result of this.

Senator FRANKEN. So as happy as we are when we are celebratory and dancing around as celebrating ourselves on Shaheen/Portman or Portman/Shahen. Whoopee, yea, yea, yea, 22,000,000 cars. Think about 88,000,000. Wow.

Anyway. [Laughter.]

I do not have enough time to really bring up my benchmarking bill, but we have done that on leasing Federal buildings or buildings leased by the Federal Government. Now I am talking about commercial buildings. Everybody think that is a good idea? Is there anyone who does not? Okay, benchmarking is good. That is a good idea.

I am out of time, so I won't talk about my energy service performance contracts on alternative vehicles except, as I am talking now, and going over my time. [Laughter.]

I think it is a splendid idea, but I am out of time, so I will not continue to talk about it. [Laughter.]

The CHAIRMAN. Thank you very much, Senator Franken.

Senator FRANKEN. Thank you.

The CHAIRMAN. I appreciate that.

Senator Warren.

Senator WARREN. Thank you, Madam Chairman.

Energy efficiency technologies can be a pretty good deal. I was thinking about this. It seems to me they are a three-fer. They protect the environment. They fight climate change. They save money for consumers.

Actually maybe I should say it is a four-fer because the energy efficiency industry is creating a lot of new jobs, good jobs, in Massachusetts and elsewhere across the country.

Last Congress Senator Crapo and I introduced legislation to encourage the use of technologies that allow businesses to operate their buildings and their equipment in the most effective way and energy efficient ways, from light sensors that turn off lights when nobody is in the room to software that optimizes a company's shipping routes. Businesses can reduce their costs and protect the environment simultaneously.

Now we know that these programs work, but without a definitive study quantifying cost savings, businesses have had a hard time weighing the costs against the benefits. Without good data they have been slow to embrace some of these tools. So I will soon be introducing a bill to direct the Department of Energy to conduct a study showing exactly how much money businesses and governments can save by adopting various technologies.

I wanted to start though by asking you, Dr. Hogan, can you talk about how quantifying the cost savings from energy efficiency technologies can encourage more businesses to adopt practices while protecting the environment?

Dr. HOGAN. Certainly. I think being able to demonstrate packages of technologies from what they cost and the savings they deliver over time is one of the key tools that we have to demonstrate to the private sector the types of things that are there that are working and that they can go on and embrace. So very effective.

Senator WARREN. Good. Can I just ask you, Mr. Nadel, do you believe that proof of the bottom line benefits of these operational efficiency, energy efficiency, technologies would encourage more businesses to adopt them?

Mr. NADEL. Absolutely. Many businesses are leery of new unproven things. They are very busy, and you really need to show them concrete evidence this will work in their application for them to get comfortable.

Senator WARREN. Good. Thank you. And Mr. Therriault, can you talk about the importance of quantifiable benefits in your work to encourage the adoption of energy efficient technologies?

Mr. THERRIAULT. I think across the nation and in different states and certainly in the State of Alaska, when it comes to energy efficiency improvements in residential structures and also as we've actually teed up legislation in our legislature this year for PACE financing which is a mechanism to help businesses implement energy efficiency at their businesses.

In all of those the effort starts with an audit of the house or an audit of the business, and then an estimation or showing that there's a business plan that the savings would be enough to make

the payment and hopefully, actually, result in positive cash flow immediately for the business. And then there, in the PACE legislation that we introduced this year, Governor Walker introduced this year, is patterned after a Texas bill which passed about a year and a half ago. There is then a follow up audit to make sure that the technology was installed correctly, is operating correctly and the savings actually are being achieved.

Hopefully those efforts then, along with any kind of information from the national labs that show the technology and the use of technology and the success of technology starts to build on itself.

And in the State of Alaska I know with our residential work our Alaska Housing Finance Corporation is the one that gathers all that data, is able then to present it back to the national and first national programs and also to our state legislature to show that we are achieving the goals. And that word starts to spread. It really starts to snowball.

We have seen it happen with residential energy efficiency improvements, and we believe we are on the precipice of kicking it off for businesses.

Senator WARREN. Well, thank you Mr. Therriault, you speak to the heart of someone who is a data nerd.

Energy efficiency programs, I think we all agree, are critical to reducing carbon emissions and fighting global climate change. We have the technology that can reduce carbon emissions while simultaneously driving down costs for businesses and consumers.

It seems to me this is a place where the Federal Government can make a real difference, not by regulation, not by spending money, but providing data for evaluating the dollars and cents benefits of different technologies.

I look forward to working with all of you to finding ways to improve energy efficiency, save money and preserve our heritage.

Thank you, Madam Chairman.

The CHAIRMAN. Thank you, Senator Warren. Senator Hoeven.

Senator HOEVEN. Thank you, Madam Chairman, and thank you to all of our witnesses who are here today. Thanks for holding this hearing on energy efficiency.

I have introduced two bills and co-sponsored a third with Senator Klobuchar aimed at addressing common sense energy efficiency reforms. We had an opportunity, Senator Klobuchar was here earlier, to talk about that bill which I appreciate very much. And we have a lot of support from a lot of nonprofit organizations. We believe it would be a very helpful piece of legislation for us to pass.

The other two that I want to mention, briefly, is first the Federal Building Energy Efficiency bill. Essentially this goes to Section 433 which is a requirement that the use of fossil fuels be phased out in all Federal buildings. The legislation I have submitted is bipartisan legislation. Co-sponsors include Senator Joe Manchin and Senator Donnelly of Indiana. This legislation would essentially allow us to continue to use fossil fuels in Federal buildings, but we keep the goal of energy efficiency. So what we say is that you could use whatever source of fuel, but you still need to meet these energy efficiency targets. It accomplishes the purpose of the legislation but it just says, you know, you can use whatever fuel source to get there as long as you are still meeting these efficiency goals. I think

that is why we have bipartisan support. I think it is very common sense legislation and hope to get, like I say, good bipartisan support to pass it.

So I ask for unanimous consent to add a support letter from 22 energy efficiency organizations to the record.

The CHAIRMAN. So noted.

Senator HOEVEN. These include the Alliance to Save Energy, the National Rural Electric Cooperative Association, Fuel Cell and Hydrogen Energy Association. And like I say, many others. So if I could ask you to add that to the record which you have agreed to, I appreciate it very much.

The second bill I would like to mention and then I will turn to Mr. Crasi for comment, is the Furnace Fix bill. I have introduced this with Senator Lamar Alexander of Tennessee which would address concerns regarding the DOE's recently proposed regulations on furnace energy efficiency.

What it deals with is this new requirement that DOE is putting forth that you can't vent a furnace out the top of the roof or the chimney. You have to essentially vent to the side. This is a piece of legislation that would address that regulation they are imposing, again, in a way, that I think is common sense.

So I ask for unanimous consent to add a support letter from six national organizations including the National Association of Home Builders, the America Public Gas Association, ACCA, the Indoor Environment and Refrigeration Institute and others to the record.

The CHAIRMAN. They will be included as part of the record.

Senator HOEVEN. Thank you, Madam Chairman.

I would now like to turn to Mr. Crasi. In regard to this legislation, Mr. Crasi, how will the Energy Department's proposed furnace regulation affect home builders like yourself?

Mr. CRASI. It is a very good question. As a new home builder there's virtually no impact because we design around a new system. We haven't installed an 80 plus furnace, I can't remember the last time we've installed one. But the challenge comes with the unintended consequences.

Senator Murkowski, you mentioned in the beginning, is that in a retrofit, especially in a townhome situation where you might have a slab on grade type of a unit, maybe sandwiched between three other units. In a slab on grade generally what's happening is that the heating unit is usually in the center of the unit, and then in many cases you have vaulted ceilings.

What happens is that the question becomes if you can't go up anymore how do you replace that system and go out because there's no way to do it.

I can give you a real life example. My first home was a three family, 1863 home. When I started to learn about efficiency, when I first bought it we put an 80 plus furnace in. It was 1980 something. And when I went to retrofit this about two years ago with a 90 plus furnace I said well, there's no way I am going to put an 80 plus back in there.

And then I looked, I go, well how am I going to vent this now? Knowing what I know about paybacks and so forth I did do that, but it cost me an additional \$800 to redo my bathroom. I had to rebuild a shower because it was the only way to get it out.

So what happens is that the payback literally doubled. So instead of a six or seven year payback it became a 12 to a 14 year payback, and then if you go down south where there's virtually no payback it becomes very challenging.

So I would say that the unintended consequences to be very cautious in that bill or I should say, be very cautious of that particular rule.

Senator HOEVEN. So it is a rule that could pose significant expenses, particularly on low income individuals that they would never be able to recoup?

Mr. CRASI. Absolutely.

Senator HOEVEN. Okay. Thank you, Mr. Crasi, I appreciate you being here and I appreciate your testimony.

Thank you, Madam Chairman.

The CHAIRMAN. Thank you, Senator Hoeven.

It goes to a point that I think there is a lot of discussion and talk about well, I want to do more. I would like to have an upgrade to the appliances or just weatherization, but it is the upfront cost and that is what seems to stop people, seems to stop so many from going further with that.

As we deal with some of these issues and do the cost benefit analysis we can say well, okay, that payback time may be a little bit longer for me. I know that I should do it, but I do not have the resources available today and particularly for those lower income families, those middle income families who, quite honestly, look at their utility bills and want to be able to drive this down.

Former Senator Therriault and I grew up in a town where energy costs in Fairbanks, Alaska are extraordinarily high right now. If you tell people that they can reduce their heating costs, their energy costs, they say sign me up today. But it is this upfront commitment that I think stalls out so many from these newer technologies.

So questions to you and I guess I will throw it out to you, Mr. Therriault. From the state side we have a few programs that can help. Obviously within the weatherization programs we have the Weatherization Assistance Program. We have got LIHEAP that is there to help low income families with their high energy bills. But in terms of those programs that can really help families get into these new technologies, what do we have out there on state side and on Federal side?

Mr. THERRIAULT. Well, Madam Chairman, I know that in the State of Alaska some of the LIHEAP money, sometimes, is utilized to help upgrade furnace technology in a home. It can be used that way, so that is beneficial.

I think that just with reference to the issue of the venting of the furnaces certainly in a state where space heat is such a critical part of the overall energy picture on a yearly basis. We're going to get full utilization out of that furnace and going to be able to amortize that additional cost of the venting. But certainly as a state, a northern state, we represent, understand that other states, the southern states that that payback would be very long term and actually, may be, a deterrent from the home or even, you know, upgrading or it could actually encourage them to switch to electric

heat which could be a less efficient form of energy in the first place.

So that issue of unintended consequences, I think, really does have to be taken into consideration.

And I am sorry, I got off here. Your main question?

The CHAIRMAN. Well, I was speaking to where a homeowner can go. Where do you go for that level of assistance to help with some of these upfront costs?

Mr. Nadel, ACEEE looks at all of this energy efficiency, these measures that are out there to look at the cost benefit to the various efforts. I do not know, do you look as you are doing a cost benefit analysis? Do you look to what that upfront cost is and how much of a hindrance that is to even moving forward?

Mr. NADEL. Yes, we definitely do, and we are strong proponents of energy efficiency financing, create financing to help homeowners and businesses address this upfront cost because most people do not have, you know, five thousand, ten thousand just sitting around ready for an upgrade.

But Mr. Therriault mentioned PACE. Quite a few states have been implementing commercial PACE laws to address this. There's also an opportunity for residential PACE.

And in California they are doing an experiment where the state is putting up money to make sure that it doesn't have adverse impacts on mortgage repayment rates. And as a result, get lots of data. If it has adverse impacts the State of California will pay, end of subject. If it actually pays and hopefully there are some information here that other states can be using. On bill finance is another approach.

So there's a lot of very creative approaches. Our organization actually sponsored an annual energy efficiency finance conference to bring together the financiers, utilities, the retrofitters, etcetera, to figure out how best to work it. But I agree with you, it is extremely important.

Mr. THERRIAULT. Madam Chairman?

The CHAIRMAN. Mr. Therriault, and then we will go to Dr. Hogan.

Mr. THERRIAULT. Yes, just on the issue. Certainly being from Fairbanks, Alaska and still having family in Fairbanks, you know the issue there, and we are really confronted with that upfront cost. Trying to encourage people in that community to switch over to natural gas as the state has got this program to bring a larger source, make more natural gas available and really build out, rapidly, a gas distribution system.

We're trying to take the second largest metropolitan area and really change them over to natural gas as quickly as possible, but that upfront cost for an individual home can be ten or eleven thousand dollars. And so we have looked across the nation to other programs that states have used.

That is why PACE legislation was introduced this year where you can help businesses convert to natural gas because that conversion, because natural gas appliances are so much more energy efficient than the fuel oil, does qualify as an energy efficiency step. And so we are putting PACE, we've teed up PACE as a financing mechanism to be put into place. No cost to the state.

It is a tool basically for local governments to use involving local lenders, and it is voluntary for the businesses. But we believe it is an attractive enough mechanism that it helps those businesses get over that initial hurdle.

For residential situations, on bill financing, allowing that for the utility to help finance the individual residential conversion is a tremendous tool. We have done surveys and focus groups and found out that the benefits that are provided through on bill financing are very attractive to consumers much more so which is surprising then the actual interest rate that's charged on the financing.

So we have looked across the nation. We're learning from other states, what other states have done, so we can apply those different mechanisms, hopefully at very low cost to the state government or no cost. But I think there is a potential rule where some dollars can come through, they might be state energy program dollars that could actually provide a loan loss guarantee on some of those loan mechanisms that could be very meaningful.

So again, there are things that can be done and believe you, me, we are looking at all of them in the State of Alaska.

The CHAIRMAN. Yes, I appreciate that.

My time has expired. Let me turn to Senator Cantwell.

Senator CANTWELL. Thank you, Madam Chair, and I am sorry I had to step out for a few minutes.

Mr. Crasi, I wanted to ask you about part of your testimony in Section 443.

Well, first, Mr. Gayer, do you support the Shaheen/Portman bill?

Dr. GAYER. Yeah.

Senator CANTWELL. Okay. Part of that Shaheen/Portman bill, the SAVE Act, would direct HUD to issue updated underwriting guidelines to allow borrowers to voluntarily submit home energy reports on their home. These reports could then be used to adjust the mortgage account for a home's energy use. Wouldn't this proposed voluntary policy of accounting for energy efficiency increase the interest of homeowners and home buyers in efficiency?

Mr. CRASI. Absolutely, it would. In any situation where you can incentivize a homeowner to do better rather than mandating it, as Dr. Gayer was saying, okay, you are going to get buy in. And a typical homeowner, a consumer is pretty smart. They know what they can afford. They know what their budgets are.

And with the SAVE Act if you incentivize by allowing banks to take into account the lower utility bills, there's part of your answer in how you afford. How do you offset some of that upfront cost? You do not necessarily have to raise the cost of the home or increase the cost of the loan. But if somehow the banks were allowed to reduce the payment based on utility prices, you've got built in savings.

I think it is a very good idea because that's what's missing if you look at the 2012 code. It is not been adopted across the country because of cost effectiveness. And so what happens is that you have a code that, in its sense is a good code, but people look at it and say it looks just too expensive.

So if you start to incentivize rather than mandate, I think you'll get better buy-in and ultimately what you end up with is a more efficient use of energy in this country.

Senator CANTWELL. Well, Mr. Nadel, do you think there is a sweet spot here between energy efficiency and housing affordability or is it all good across the board?

Mr. NADEL. No, there probably is a sweet spot. We have to pay attention to what is affordable. I think the key issue, particularly when it comes to building codes and building new construction is, since basically everybody finances their new home through a mortgage, you need to look at if you increase the cost for energy efficiency how much will that increase the mortgage payment and make sure that the monthly energy savings are greater than that.

Current mortgage rates that will work out to be in the current code, the 2012 or even the 2015 code is quite cost effective. Pacific Northwest Lab in Richland, Washington did that detailed study and found that in general the first year mortgage costs are going to be less than the energy bill savings. So I think that's the sweet spot.

Senator CANTWELL. Thank you.

Thank you, Madam Chair.

The CHAIRMAN. Thank you.

Senator Portman.

Senator PORTMAN. Thank you, Senator Murkowski.

And again, I appreciate your willingness to hold a hearing and also your personal commitment to this issue from the start and your strong support for the legislation that has been to the Floor a couple times now and got to this Committee with a 19 to 3 vote last time. I think it is a demonstration of how much bipartisanship there is around at least some of these issues and specifically S. 270.

Senator Shaheen talked about it in detail earlier, so I won't go into detail except to say that some of the things we heard about today, the ESPCs, certainly, the nonprofits, you know, we would like to include in the legislation. We are working on some of the ESPC issues in terms of the cost. The CBO scoring now helps us, the nonprofits.

I appreciate the fact that Senators have been willing to work on lowering some of the costs there and being sure we have offsets that we can defend as we do with the other offsets because the legislation does not have a cost. It does not have mandates, and that's one of the reasons we've been able to get these big votes and get it to the Floor a couple times. So, again, I really appreciate the support of that legislation.

The legislation, we now have almost 300 groups and trade associations supporting it. I was glad when Senator Cantwell, who has been a great supporter of energy efficiency, asked Dr. Gayer whether he supported it or not because I was not sure. When you said, yes, I was like, okay, now I know everybody on this panel supports it. [Laughter.]

But—

Senator CANTWELL. It is a love fest today.

Senator PORTMAN. Yeah, but thank you for asking him because I did not have the guts to do it. [Laughter.]

But ACEEEE, Steve, you guys have been unbelievable in providing data around this because it is easy to talk about this in general

terms. It is harder to get specificity, and that has been very helpful.

And NASEO, Gene, you guys have been at this for four years now, supporting the legislation. I know you would like to see even more in some areas, and some of the stuff you are doing in the state that you just talked to Senator Murkowski about is very exciting.

We appreciate that, and we are going to need all the support we can get. It is not easy to get things done around this place, but if you have that kind of momentum, I think it can really work.

Tony, thank you for coming back again. You are a glutton for punishment getting into this issue. I know it is not always easy, but you have been a great partner for us. As you said, we brought you in as a stakeholder, and you improved the legislation. We made some major changes to the legislation based on your input. I appreciate your strong support of the SAVE Act. I think that has helped the legislation, not just gain support, but actually have a bigger impact in terms of 40 percent of our energy going into buildings and this notion that Steve and Ted have talked about in terms of the homeowner and how do you make this not a mandate, but makes this an incentive to be able to do the right thing. And incentives are certainly out there.

To Dr. Hogan, you guys supported S. 270 last Congress. I appreciate your looking at the legislation again. You will like it even more, trust me. Just say yes. No. [Laughter.]

But really, you guys have been terrific partners in this, and we have made some changes, as you know, based on some of the things that you want to do administratively. I do think it is fair to say and you tell me, but that we are trying to codify some things you would otherwise like to do in terms of coordination and streamlining. Is that accurate?

Dr. HOGAN. The devil is in the details, but I think, yes, that's accurate.

Senator PORTMAN. Yeah. I mean we did talk earlier about the fact that there is a need for more coordination and of some of your programs and the advanced manufacturing provisions, for instance, I think you all support because of that. So we will continue to work with you, of course, on that.

Today we do have this one bill, 535, that is being signed into law. Again, Tony, thank you for your support of that legislation. It does help in the Tenant Star program, and I think has great potential in the commercial building side.

The one question I guess I would have for Mr. Nadel in terms of the analysis of the impact of this bill. You mentioned 190,000 jobs. Can you tell us how you got to that estimate of the legislation and maybe tell us a little more how we should describe that?

Mr. NADEL. Okay.

Yes, that's—our analysis of the 2013 legislation with some adjustments. We are planning as soon as this Committee marks up their bills, to do an updated analysis on all of these bills so they will be probably some changes.

But in terms of the jobs, we do, we have a detailed input/output analysis model of the U.S. economy. So we look at what the costs

are at each of the sectors, what the benefits are of each sector and how that works through in terms of the overall economy.

Our estimate is net jobs, meaning how much do you—jobs are created as a result of the savings, but minus the fact that if you use a little less energy, you are costing some jobs. So those are net jobs, and we feel very importantly that you really have to look at it in a net basis. Some of the studies just look at one side and forget the other side, but it is a detailed model of the U.S. economy and detailed analysis of each provision in terms of how much it will save in cost each year.

Senator PORTMAN. Great. Well, we would appreciate the additional analysis based on whatever new legislation there is and specifically giving us all the background so we can describe better to our colleagues, frankly, why this is not just about fewer emissions and helping in terms of the energy side. It is actually a jobs bill, and it will create more activity.

The one thing I think your analysis does not fully appreciate and can't easily do is just the impact on competitiveness. I hear this in Ohio constantly, that these companies are competing with companies in Japan and Germany and elsewhere that, for years, have focused more on efficiency because they have had higher energy prices, frankly.

Now we have the opportunity to be able to provide some technologies that we enable them in part through the DOE to work with a competitive advantage.

So again, thank you, Madam Chair, I really appreciate it.

I will repeat what Senator Shaheen said, we really want to mark up our bill again, and we have done it twice. It is gotten to the Floor twice. We know that we have the formula. We have these 300 groups behind us. We want to include whatever good legislative ideas there are, but we also want to keep this as a bipartisan measure and one where we can find common ground. Thank you.

The CHAIRMAN. Thank you, Senator Portman.

Senator Franken.

Senator FRANKEN. Thank you, Madam Chair.

I agree, Mr. Nadel, your data is very, very appreciated. How much, again, would the energy efficiency resource standards help save in regard to taking, say, cars off the road in relation to the previous Shaheen/Portman or the Shaheen/Portman as it existed before?

Mr. NADEL. Alright. Just to reiterate as I said before we very much support Shaheen/Portman.

Senator FRANKEN. Yes.

Mr. NADEL. And we'd like to take Shaheen/Portman and add to it the savings from the EERS bill. But the savings from the EERS bill are about three times. I have not checked the car calculations right here.

Senator FRANKEN. Okay.

Mr. NADEL. But it is, I would add about three times.

Senator FRANKEN. I was just trying to make a point. Benchmarking is essential for improving energy efficiency in our buildings unless we really know how much energy their buildings are using we cannot be sure how much energy will be saved from using energy efficiency technologies.

I am proud that my benchmarking bill was included in the Energy Efficiency Improvement Act which the President is signing later today. That bill will require commercial buildings that are leased by the Federal Government to benchmark and disclose their energy use, and this energy data will help the Federal Government identify the most cost effective ways to reduce its energy use.

But today I want to talk about a new bill which you mentioned, S. 1052, which would support policies and incentives at the state level to encourage more commercial buildings to participate in benchmarking programs. We have adopted this in Minneapolis. Some other cities around the country have already started commercial building benchmarking programs. Mr. Nadel, can you talk about how well these programs are working?

Mr. NADEL. Yes, these programs are working very well. There's about a dozen cities that are making data available to building owners so they can identify their worst performing buildings and target their efforts. In many of the cities they make the data available so energy performance contractors can see which are the less efficient buildings and target them for marketing.

There's also useful data for would be purchasers or renters so that they know what the energy bills may be because to over generalize on average, you know, the mortgage cost is typically the number one cost. But energy costs are right up there with taxes as number two, varying very much from building to building jurisdiction to jurisdiction. So this would help.

I would point out that the bill that is being signed today in addition to Federal buildings also has Department of Energy conducting a study on benchmarking disclosure best practices. So that will provide some very useful information to other cities. Atlanta and Portland, Oregon just in the last two weeks have adopted similar laws but hopefully this will be useful for others.

What I like about your new bill is it includes two additional provisions. One of which was also in Shaheen/Portman but got left out by the House, the other of which is new, the one that has small matching grants available to utilities and utility regulators to figure out ways to better aggregate energy use data so that a building owner can get the full energy use of the building. Now they can get the energy use on their meters, but they have no idea how much is used by the tenants. Aggregation allows the utilities to combine them all together, protecting privacy, but you get the total of your hundred apartments or your eight different tenants. That would help.

Senator FRANKEN. I just want to move on. You mentioned ESCOs, and we were talking and Mr. Therriault talked about PACE.

All of these different financing models that are really, I think, just revolutionizing the way we do this because that way you can finance. Because we were talking about upfront costs, well if you can get an ESCO to do an energy service performance contract you can, we can, do this without an upfront cost, right? That is the whole point of this.

I am running out of time, but I want to tout my ESPCs for alternative vehicles, and can I take a few seconds on this?

Assistant Secretary Hogan, can you talk about some of the efforts in your office to develop and deploy more efficient vehicles and how much energy savings you think are possible with alternative vehicles? The reason I am bringing this up is what my bill would do is allow the government to buy fleets of new, energy efficient vehicles using energy service performance contracts.

Dr. HOGAN. Yeah, certainly we have got a number of goals that we are trying to achieve in the Federal sector to improve the efficiency of our Federal fleets in addition to the work we are doing with buildings and facilities. We do have challenges with the mechanisms that we have in the Federal fleet's world, so I think being able to explore new mechanisms that can allow us to look at those and more and bring in more efficient vehicles and get the financing as help to do that would be a great thing to examine.

Senator FRANKEN. Because vehicles and equipment account for over 60 percent of the Federal Government's energy use and over 70 percent of its energy expenditures. So if we could do this, this would be a great way of cutting energy costs for the government.

Thank you. Thank you for this hearing and for all your support for energy efficiency both to the Chair and the Ranking Member.

The CHAIRMAN. Thank you, Senator Franken, Senator Cantwell, and all the members who have clearly not only engaged today but have been engaging for a long period of time.

I think we have a great deal of common ground here that we can explore as we move forward in this first title of our energy bill. But some of the priorities that have been placed in front of us, not only with the legislation that is under consideration, but just some of the good work that has been in place in our states as those laboratories or has been suggested. And working through individuals with really great ideas about how we can really make a difference when it comes to providing for a level of efficiency that is common sense that people want to participate in, that helps with jobs, it helps with the economy, it helps with the environment.

As I say, it is all good when it comes to our energy, and energy efficiency is that first energy source that we need to be looking to for a level of common sense.

So thank you for your respective leadership in different areas here, and know that we will be looking to you for further comments as we build out these titles.

And with that, we stand adjourned.

[Whereupon, at 12:26 p.m. the hearing was adjourned.]

**APPENDIX MATERIAL SUBMITTED**

---



**Department of Energy**  
Washington, DC 20585

October 5, 2015

The Honorable Lisa Murkowski  
Chairman  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20515

Dear Madam Chairman:

On April 30, 2015, Dr. Kathleen Hogan, Deputy Assistant Secretary for Energy Efficiency, Office of Energy Efficiency and Renewable Energy, testified regarding Energy Efficiency Legislation.

Enclosed are answers to questions submitted by Ranking Member Maria Cantwell, Senator Joe Manchin, and you to complete the hearing record.

If you need any additional information or further assistance, please contact me or Fahiye Yusuf, Office of Congressional and Intergovernmental Affairs at (202) 586-5450.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Shimek".

Jaime Shimek  
Deputy Assistant Secretary for Senate Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Maria Cantwell  
Ranking Member



## QUESTIONS FROM CHAIRMAN LISA MURKOWSKI

- Q1. At the hearing DOE declined to make recommendations on any of the specific bills before the Committee. Now that DOE has had more time to examine the bills, what are your recommendations on each bill as to whether Congress should include that bill or parts of it in any broad-based energy bill? In answering this question, please give us your analysis of each of the bills.
- A1. The Administration is continuing to review these bills, and does not have a position on them at this time. As I mentioned in my testimony, the Department of Energy appreciates ongoing bipartisan efforts to promote energy efficiency and welcomes the opportunity to continue to work with the Committee and the range of bill sponsors as legislation works its way through Congress.
- Q2. As Mr. Therriault testified, the State Energy Program is among the most successful energy programs supported by Congress and it is the only program operated by the U.S. Department of Energy that provides formula funding directly to the states for energy efficiency and other state priorities. However, in recent years DOE has utilized a portion of the states' formula funds for competitive awards that further DOE's priorities, not the states' priorities. The resources required for states to respond to the competitive solicitations puts states with smaller staffs, such as Alaska, at a disadvantage and decreases the funding available to the state to pursue its priorities. Could you please explain why DOE is moving away from the formula-based approach that Congress created?
- A2. The Department of Energy (DOE) recognizes that the formula-based approach for funding is the core of DOE's State Energy Program (SEP). The FY 2016 Budget demonstrates the Department's support for this core effort by requesting \$45 million for the formula grants, \$6 million (15%) more than the FY 2015 enacted level. The formula grants make up 64 percent of the \$70 million total FY 2016 request for SEP. Separate from the formula grants, DOE also provides funding for competitive grants through SEP. This funding enables states that choose to apply for competitive awards to work on individual, multi-state or regional initiatives that help accelerate job creation, reduce energy bills, and achieve the economic and environmental benefits that clean energy offers. These competitive awards complement formula funding and help promote progress at the state level. The FY 2016 Budget includes \$15 million for competitive grant funding, which is approximately ten percent of the SEP total.

The SEP's competitive funding opportunities allow states to compete for funding by submitting innovative proposals that leverage federal funding and create clean energy projects focused on high-impact market transformation and cross-cutting solutions at the state level. The overall objective is for awardees to develop public-private partnerships to deploy policies and technologies that have the best opportunity for geographic and local economic impact with the ultimate goal of sharing these successes with all states as replicable models.

Competitive awards have been a part of the SEP portfolio for nearly twenty years with many important outcomes. Since 2008, more than 75 competitive grants have been awarded to states, including two awards to the State of Alaska. In 2010, Alaska was awarded \$700,000 to develop high-impact policy and program frameworks to support investment in energy efficiency and increase energy savings statewide. In 2012, Alaska was awarded \$487,000 for a project under which the Alaska Housing Finance Corporation will improve and develop the Alaska Energy Efficiency Revolving Loan Fund program for public facilities. Under this latter award, the state is developing Facility Manager's Guide to Energy Retrofits, which could be a model document with utility to many other states.

In the last five years, DOE has provided great flexibility to states through several Areas of Interest, including, state energy planning; opportunities for innovative energy efficiency and renewable energy practices; advancing industrial energy efficiency; stimulating energy efficiency action; driving demand for public facility retrofits; clean energy economic opportunity roadmaps; advancing energy efficiency in public buildings; deploying fee-based, self-funded public facility energy retrofit programs; enhancing commercial building retrofits through streamlined standards and policy initiatives; initiating a state energy extension partnership; and strengthening building retrofit markets. Funding in these areas allows states the flexibility to select from among several policy, program and regulatory levers to address in a project while also focusing on those actions that can achieve the greatest energy savings and other benefits for their state or region.

- Q3. In Mr. Nadel's written testimony he says that a couple of sections in the industrial section of S. 720 (Portman-Shaheen) need to be updated because the proposed efforts are now being done by DOE using existing authority. How are you using your existing authority to advance energy efficiency efforts? What energy efficiency-related initiatives have you developed and implemented in the past year? What are the costs associated with those initiatives?
- A3. Several statutes grant the Department the authority to advance energy efficiency efforts across the Office of Energy Efficiency and Renewable Energy (EERE). For example, current authority allows the Department to address clean energy manufacturing and industrial energy efficiency challenges through pre-commercial technology development through facilities and manufacturing consortia. EERE-supported Clean Energy Manufacturing Innovation Institutes are public-private partnerships focusing on RD&D of foundational technologies that are broadly applicable and prevalent in multiple industries and markets within the energy sector and that have potentially transformational technical and productivity impacts for the U.S. manufacturing sector more broadly. Institutes and all current EERE manufacturing R&D efforts are authorized under the following existing authorities:
- P.L. 109-58, "Energy Policy Act of 2005," 2005  
The Energy Policy Act of 2005 set forth an energy agenda covering a wide range of energy technology research and implementation activities with provisions applicable to AMO activities.
  - P.L. 110-140, "Energy Independence and Security Act of 2007," 2007  
The Energy Independence and Security Act of 2007 (EISA) set forth an agenda for improving U.S. energy security across the entire economy. Industrial energy efficiency is specifically called out in Title IV.
  - P.L. 102-486, "Energy Policy Act of 1992," 1992  
The Energy Policy Act of 1992 established numerous requirements for industrial efficiency, including those listed under Title I, Subtitle D, and several sections under Title XXI.
  - P.L. 95-91, "U.S. Department of Energy Organization Act," 1977

This legislation consolidated the Federal Energy Administration and the Energy Research and Development Administration to create the Department of Energy and define its mission.

One specific and relevant example of a recent effort under these authorities is the release of a Notice of Intent to issue a competitive solicitation in 2015 to fund a Clean Energy Manufacturing Innovation Institute focused on smart manufacturing. Smart manufacturing utilizes a suite of tools to enable real-time operational energy efficiency improvements in manufacturing ranging from unit processes to factory-wide integration to enterprise-wide energy management. Funding for this Institute, like other current energy efficiency activities, is specifically appropriated by Congress. This Institute was funded for \$14 million in each of FY 2014 and FY 2015, for a total of \$28 million through FY 2015. The Department is requesting \$14 million in the FY 2016 Budget Request for the third of five total years of support.

In addition, to maximize taxpayer resources and avoid duplication, EERE actively coordinates across the Department on energy efficiency activities executed under existing authority. For example, through DOE's Clean Energy Manufacturing Tech Team, efforts are coordinated across EERE and the Department to support research and development of clean energy manufacturing technologies that help address market barriers that affect those technologies and enhance U.S. manufacturing while advancing progress on our nation's clean energy goals. The cost for supporting this Tech Team is minimal; however, this coordinated effort has a positive impact on the coordination of clean energy manufacturing work across nine EERE programs and across DOE.

- Q4. I understand that DOE has recently raised concerns over Sec. 441 of S. 720 (Portman-Shaheen), which addresses voluntary verification programs for air conditioning units, furnaces, boilers, heat pumps and water heaters and has been in the public realm for a long time. What suddenly got DOE's attention after all this time? And are you comfortable at this juncture saying that those concerns will soon be resolved?
- A4. A voluntary, independent verification program can play an important role in conducting verification testing and helping the Department use its resources wisely. In 2013, the Department has announced its willingness to work with industry to establish potential

requirements for a DOE-approved voluntary industry verification program. DOE began negotiated discussions with industry, trade organizations, third-party laboratories, and energy-efficiency advocacy groups regarding a DOE-approved industry verification program for commercial refrigerators, air conditioners and heat pumps, and furnaces during the summer of 2013. The negotiation stalled, however, and the Appliance Standards Rulemaking Federal Advisory Committee, which is comprised of several major manufacturers of the aforementioned products, voted that DOE should not continue negotiations at that time due to the wide and different views expressed by various industries, testing organizations, small domestic businesses, importers, global manufacturers, etc.

- Q5. The Administration's rulemaking timelines and requirements for revising energy efficiency standards can conflict with those of other Federal agencies, such as EPA. What processes are in place to keep manufacturers of energy efficient products from having to perform expensive and unexpected testing to meet DOE standards they have already complied with in their current products when another agency changes their requirements on those same products?
- A5. DOE regularly coordinates with the Environmental Protection Agency (EPA) with respect to its refrigerant regulations under the Significant New Alternatives Policy (SNAP) Program, and its voluntary energy efficiency program (ENERGY STAR) in order to evaluate the most effective and least burdensome path for manufacturers to meet the regulatory requirements of each agency in accordance with the applicable statutes. For instance, the agencies coordinated the compliance dates for many of the products impacted by EPA's Change of Listing Status for Certain Substitutes Under the SNAP Program final rule (80 FR 42870) with multiple DOE energy efficiency rulemakings so that manufacturers can do the design and testing of their equipment at the same time in order to comply with both the EPA and respective DOE rulemaking. This coordination regularly includes sharing of schedules for pending regulations and the associated compliance timelines for manufacturers. However, DOE notes that the statute requires that any amended energy efficiency standards established by rulemaking must apply to equipment that is manufactured on or after 3 years after the final rule is published in the Federal Register unless DOE determines, by rule, that a 3-year period is inadequate, in

which case DOE may extend the compliance date for that standard by an additional 2 years. (42 U.S.C. 6313(d)(3)(C)).

- Q6. As part of the energy conservation standards rulemaking process, the Department of Energy conducts cost-benefit analysis and considers how new test procedures and minimum performance requirements will affect the retail prices paid by consumers for the appliance. Please provide for us the following:
- A list of the energy conservation standards issued in the past 10 years;
  - The price increase DOE predicted in their final rulemakings for each product class; and
  - The actual changes realized in manufacturer price one year after the new energy conservation standards took effect.
- A6. DOE is currently supporting a market retrospective analysis on the realized impact on market prices for several products.
- Q7. The Administration's support of alternative fuel vehicles is well known. However, increased use of electric vehicles and natural gas vehicles would necessarily be in conflict with a national energy efficiency standard that requires reductions in electricity and natural gas use year after year. How do you reconcile the Administration's support of alternative fuel vehicles with an energy efficiency resource standard based on both electricity and natural gas use reductions?
- A7. DOE through its Vehicle Technologies Office (VTO) has supported the advancement of natural gas vehicles (NGVs) for more than two decades. These activities support increased awareness and advancement of NGV technologies for the consumer market as well as truck and bus fleet applications. Areas in which natural gas vehicle R&D is needed include on-board fuel storage and engine efficiency. Engine efficiency can be addressed through several mechanisms, including turbocharging, direct injection, dilute combustion and lean burn operation. Each of these either requires components not yet available in a form tailored for use with natural gas or has substantial room for improvement relative to the status quo. Natural gas engines are 15 to 20 percent less efficient than comparable diesel engines. VTO seeks to approach efficiency parity with diesel engines.

Additionally, through its EV Everywhere initiative, DOE seeks to enable the U.S. to produce a wide array of plug-in electric vehicles (PEVs) that are as affordable and convenient as

gasoline powered vehicles by 2022. Performance and cost targets guide the Department's investments focused on reducing the combined battery and electric drive system costs of a PEV by up to 50 percent.

Although it is true that greater penetration of EVs, for instance, would increase electricity consumption, DOE does not oppose the use of electricity – it supports *efficient* use of electricity. As well as related greenhouse gas emissions and criteria air pollutants, and would reduce our reliance on imported oil. Similar benefits could be realized by switching to NGVs.

## QUESTIONS FROM RANKING MEMBER MARIA CANTWELL

Q1a. Section 432 of S. 720 proposes several changes to DOE's responsibilities under EISA § 433. Section 432 (b)(1)(C) makes changes to the DOE's selection of certification systems for green buildings. These changes include clause iv adding a requirement to confirm the criteria for selecting building products materials brands and technologies are fair and neutral , and to use environmental and health criteria that are based on risk assessment methodology.

Would this change the ability of federal buildings to use innovative materials and products, which can spur our manufacturer's economic development of US manufacturing?

A1a. DOE cannot comment specifically on whether the circumscribed use of green building certification systems as proposed in Section 432 of S. 720 would change the ability of federal buildings to use innovative materials and products. Its principal effect would be to prescribe intensive and detailed Federal government review of private sector systems for inclusion of government-imposed criteria.

Q1b. How would the agency implement it?

A1b. Under proposed revisions to 42 USC § 6834, DOE would be required to

- Make a separate determination for all or part of each system.
- Confirm that the system used neutral / non-discriminatory criteria to select building materials and that the system's environmental and health criteria are based on accepted science.
- Exclude the portions of the system that the fail the above.
- Exclude the whole system if the exclusion of failing portion "impedes the integrated use of the system" creates disparate review criteria or unequal point access for competing materials, or costs more for agencies.

DOE would need to consider carefully an implementation approach to the proposed revisions. Among considerations would be whether to establish a public process to determine acceptable criteria for what may be neutral or non-discriminatory approach to a system owner's selection of buildings materials. DOE would need to define "accepted science" and then make a transparent and defensible determination of the accepted

science of a given system's environmental and health criteria, with a potential role for peer review. DOE may also need to consider administrative processes to hear any resulting claims from certification system owners who believe DOE reached invalid or incorrect conclusions about elements of their systems.

- Q2. Another proposed change to Section 433 is to focus on only commercial and residential buildings.
- a. In your view does that overly narrow the type of buildings to be certified (For example, federal data centers are a big opportunity for energy savings)?
  - b. How do these criteria agree with, support, or conflict with the new Executive Order?
- A2. DOE is unclear whether the question is referencing Section 433 of S. 720, or Section 433 of EISA. If referencing EISA Section 433, with regards to sustainable design standards, projects are distinguished as new construction and major renovations or existing buildings, rather than directly on building use type. This is how the Guiding Principles for Federal Leadership in High- Performance and Sustainable Buildings are applied to buildings. The distinguishing factor in building benchmarking is based on the buildings' energy use and type. It would be difficult to include specialty facilities in the same category as Federal office facilities, as the building and energy use in specialty facilities is drastically different and would preclude any possibility of comparisons of baselines with non-specialty facilities. All green building certification systems have separate categories of building types. Section 303 of S. 720 covers data centers and there are a number of other regulations, mandates and initiatives currently enacted, including the new Executive Order 13693, that focuses on specialty facilities such as data centers.

E.O. 13963 mandates that beginning in FY 2020, all new construction greater than 5,000 gross sq.ft. that enters the planning process is designed to achieve energy net-zero, and be water or waste-net-zero, where feasible, by FY 2030 and that, beginning in June 2016, agencies must identify within their Strategic Sustainability Performance Plans at least 15 percent (by number or total sq. footage) of buildings above 5,000 gross sq. ft. that will comply with the revised Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles) by 2025. Agencies must make annual

progress towards 100 percent conformance with the Guiding Principles for its building inventory. Therefore, the provisions of this proposed bill dealing with green building certification programs will be in support of existing mandates, so long as those programs selected align with the Guiding Principles.

- Q3. Other sections are not updated:
- a. What has been the effect of the provision authorizing life cycle cost effective water conservation?
  - b. Would this increase agencies' water savings efforts, or constrain such efforts?
  - c. If water is cheap, or there is a remote facility with its own water system, does that mean the water conservation practices will not be adopted?
- Q3. In general, DOE encourages all Agencies to ensure that all energy and water conservation measures implemented in Federal facilities are life cycle cost effective. The use of life-cycle cost (LCC) can be especially beneficial in identifying opportunities to bundle individual projects together and, therefore, achieve greater savings while being more cost-effective to implement. DOE strongly promotes the practice of bundling energy and water conservation measures into larger projects to reduce costs. Section 2(c) of Executive Order 13423, which has been revoked by Executive Order 13693, established water use reduction goal for agencies.

Under E.O. 13423, agencies were required to reduce water consumption intensity from the FY 2007 baseline by two percent annually through the end of FY 2015, using life-cycle cost-effective measures, for a cumulative reduction of 16 percent by the end of FY 2015. Executive Order 13693 mandates reducing agency potable water consumption intensity measured in gallons per gross square foot by 36 percent by FY 2025 through reductions of 2 percent annually through FY 2025 relative to a baseline of the agency's water consumption in FY 2007.

Overall, the Federal Government's water intensity in FY 2014 was 42.1 gallons per gross square foot, a reduction of 20.7 percent from the 53.1 gallons per gross square foot reported in FY 2007.<sup>1</sup>

- Q4. Would the result of these proposed amendments, in your opinion, advance the goals of high performing, low fossil fuel consuming federal buildings?
- A4. Advancing the goal of implementing high performing/low fossil fuel consuming federal buildings through the requirements proposed in this bill would be a challenge.
- Q5. How would the changes to GSA's criteria for review of green building certification systems as proposed in section 411 of S 720 affect DOE's activities?
- a. Would this require another rulemaking?
  - b. Would these changes improve agency performance?
- A5. The proposed Section 411 amends the provisions of the Energy Conservation and Production Act that require GSA to review green building certification systems and provide that review to DOE so that DOE may identify a system for government use. The relevant changes apply to the scope and specifics of GSA's review, which gets transmitted to DOE for DOE's evaluation and the Secretary's eventual identification of a green building certification system under 42 USC 6834(a)(3)(D). As such, the review that DOE receives from GSA will change according to the new provisions. As written, none of the changes of this section would apply to DOE or change its current statutory responsibilities to identify a green building certification system.

---

<sup>1</sup> Federal Facility Annual Energy Reports and Performance. <http://www.energy.gov/ecre/femp/federal-facility-annual-energy-reports-and-performance>

## QUESTIONS FROM SENATOR JOE MANCHIN

Q1. In your testimony, you state that: DOE technical assistance also supports the achievement of the national goal set by President Obama of developing 40 gigawatts of new, cost-effective industrial Combined Heat and Power by 2020. Are you on track to achieve this goal?

A1. Achieving the national goal set out in Executive Order 13624 of 40 GW of new, cost effective combined heat and power (CHP) capacity by 2020 requires a public-private partnership approach from many stakeholders, including the Department of Energy which supports this goal. However, ultimately it is the private sector as well as state and local municipalities that deploy CHP as an energy resource in their factories and at their facilities.

As of December 2013, 1.6 GW of new CHP has been installed in the United States. Preliminary data to be released by the Department in June 2015 indicate that an additional approximately 0.8 GW was installed in 2014. The Department expects that there are about 4.5 GW in various stages of development anticipated to come on-line in the 2015-2016 time period. Large energy intensive industrial facilities such as chemicals, paper, food processing, primary metals, and other industrial sites continue to comprise the bulk of the new capacity installations since 2012. Colleges and universities, district energy with CHP, hospitals, wastewater treatment facilities, and others are also emerging as potential CHP installations.

The Department has two roles in supporting the administration's CHP goal: technical assistance to promote CHP through the dissemination and data regarding potential CHP implementation, and technology applied research and development (R&D) focused on the development of underlying science and technology which would enhance cost-effective CHP approaches for the future. The cornerstone of the Department's efforts towards meeting the goal is the Advanced Manufacturing Office's CHP Deployment Program. The Program promotes and assists CHP market transformation throughout the United States through technical assistance, not direct deployment. The CHP Deployment Program supports greater deployment of CHP by disseminating information like market assessments of technical potential to strategically target markets where penetration is

lagging behind potential; compiling and sharing information on over 4,300 operational CHP facilities currently in the U.S.; and supporting direct site-specific technical assistance through CHP Technical Assistance Partnerships. In the area of CHP R&D, the Department advances technologies that lower the cost and increase the performance of these systems, supporting greater CHP deployment. With the low cost and abundance of fuel in the United States, there has emerged a need to focus technology R&D activities on foundational challenges that if successful, could greatly reduce the capital cost and improve the efficiency of deploying CHP systems for the future. The Department is focusing these CHP R&D activities on foundational technologies which have significant potential to enhance the energy productivity and hence reduce the cost of CHP systems. These technologies would also be expected to have cross-cutting impact on other manufacturing processes, and as a result are beneficial to multiple energy related manufacturing sectors.

**U.S. Senate Committee on Energy and Natural Resources  
April 30, 2015 Hearing: Energy Efficiency Legislation  
Questions for the Record Submitted to Mr. Tony Crasi**

**Questions from Chairman Lisa Murkowski**

**Question 1:** *The bills included in this hearing demonstrate a variety of ways that the Federal government might interact with stakeholders, such as encouraging the use of voluntary programs, prescribing standards, negating standards, providing grants, and encouraging regional interactions. In your opinion, what role should the Federal government play in energy efficiency efforts?*

**Answer:** Energy Efficiency is an important goal and the government should play a role in encouraging consumers to make these investments – incentive programs have been particularly successful in this regard, however, the free market should determine which products and technologies are used to achieve these goals.

During my testimony, I spoke about the role the Department of Energy (DOE) plays in the development of model building energy codes. While these codes are not federal mandates themselves, DOE has a significant influence in the energy code development process and then also encourages states and localities to adopt them. Once adopted by a state or local jurisdiction, the codes serve as mandates for builders and home buyers.

DOE has, at times, crossed the line from “technical advisor” to “advocate,” supporting certain products and technologies. For example, during the development of the 2012 IECC, DOE put forth a proposal that would prescriptively require foam sheathing in certain climate zones. DOE should not advocate for the use one product or technology over the other in the development of energy codes and legislation is needed to protect against this.

*What one thing, that it is not currently doing, could the Federal government do to make implementing energy efficiency measures or technology attractive to the people and organization you represent?*

**Answer:** There are a number of market barriers to energy efficiency. High investment cost and lack of accurate appraisals are perhaps the most significant.

- 1- High cost – New buildings are significantly more energy efficient than older buildings. In fact, buildings constructed to meet the 2012 IECC are 30% more efficient than buildings constructed to meet the 2006 IECC. While there is still room to retrofit older buildings, much of the so-called “low-hanging fruit” in energy efficiency (e.g. lighting, windows, etc.) is already required in new construction. Improving the performance of new buildings, beyond the energy code, can be very expensive.

The government can help consumers offset these high initial costs by establishing incentive programs. Of all policies, tax incentives see the fastest results and are the most effective at advancing energy efficiency improvements. Sections 25C for qualified

improvements in existing homes (building components), 45L for new homes and 179D for commercial buildings have permeated the market and assisted many families and building owners invest in efficiency. Unfortunately, over the last few years, these tax incentives have expired, and have only been retroactively renewed. Builders and home buyers cannot take the risk of a tax incentive “possibly” being renewed, and as such the success of these programs have declined. Congress should make these incentives a permanent part of the tax code.

- 2- Appraisals – While energy efficiency investments can result in meaningful savings for home owners, unfortunately they are often not reflected in home appraisals. The SAVE Act, included in S. 720, seeks to rectify this problem by allowing home buyers to submit an energy efficiency report to their lender. If the appraisal does not reflect the investment in energy efficiency, the lender would then use the report to adjust the loan-to-value calculation. Additionally, the bill would allow the report to be used for mortgage qualification calculations. Utility costs are a significant monthly cost and to the extent that lenders examine a buyer’s ability to pay, energy savings should be reflected in that analysis.

**Question 2:** *In your written testimony, you mention that DOE inserts specific products and building construction methods into the code. Could you please describe what impacts these constraints have had on your construction business including your ability to hire personnel or make a profit?*

**Answer:** While one requirement in a code may not directly impact my business, it is the continuous increase in construction costs that drives buyers away from new construction. The codes are updated every three years, and thus new requirements are added every three years, often times without regard for cost. The 2012 IECC, for example, added \$5,668 (national weighted average) to the cost of a new home. In some parts of the country, this initial cost exceeded \$7,000. While improving the efficiency of a home is expected to have some costs, those costs should be offset through reduced utility bills. Unfortunately, the 2012 IECC would take an average home owner over 13 years to recoup those initial costs, and in some places as high as 17.3 years. Home owners do not usually own their home for that long.

When analyzing whether they should purchase a new home or existing home, these calculations are critical. Moreover, these costs can prevent families from qualifying for a mortgage. For every \$1,000 increase in the price of a new home, 246,000 households will be priced out of mortgage eligibility for a 30-year, fixed-rate mortgage with a 5% interest rate.

While increased costs impact all potential home buyers, one of my greatest concerns is watching our low income families slowly lose the ability to purchase a new more energy efficient home. I have sat on the board of directors of a non-profit affordable housing association for over 8 years.

During those 8 years I have watched construction costs increase and because of wage stagnation, many of our lower income families can no longer qualify for a loan thus denying them the opportunity to improve their quality of lives.

Overall, fewer people purchasing new homes means less business for home builders and fewer people living in modern, energy efficient homes.

*Would it be possible for you to achieve the same energy savings for your customer without using these prescribed methods?*

By creating a more prescriptive code, builders have less flexibility to achieve energy efficiency. A builder may be able to achieve even greater energy savings if they are permitted to design a home based on the buyer's needs and behaviors. For example, if a home is built in a particularly warm climate, using a highly efficient air-conditioner, above federal standards, may significantly reduce the utility bill. This investment may also make sense for a home owner who works from home because the air-conditioning would be used for a longer period of time (during the work day). Using that highly efficient air-conditioner may not make any sense for a home owner in a cold climate because that investment will never be recouped if the home owner doesn't use air-conditioning. Builders can meet energy efficiency targets, but their hands must be untied to make the best decisions for the buyer.

A successful example of encouraging regional interaction is in Ohio where the Ohio Homebuilders Association was given the opportunity to submit an alternative energy path to compliance. Our alternative path was not only more energy efficient but costs less to implement, thus saving home buyers thousands of dollars in construction costs and future energy bills. States should have the flexibility to create a code that works for them, and DOE should help facilitate this, instead of only focusing on a one-size-fits-all approach.

**Questions from Senator Joe Manchin**

In your testimony, you discuss the need for S. 1029 to address the recently proposed DOE rule for residential gas furnaces.

**Question 1:** *Can you provide examples of the challenges that are often associated with replacing an existing non-condensing furnace with a condensing furnace?*

**Answer:** Replacing an existing non-condensing furnace with a condensing furnace will require remodeling to re-route the exhaust system. While non-condensing furnaces typically vent through the roof or chimney of a home, most condensing furnaces must vent through a sidewall of the building, using different venting materials.

It may actually be impossible to vent out of the side of the building if the home owner lives in a row home or condo building where the existing furnace is located in the center of the home. In many cases when a furnace is located in the center of the row home, that space is surrounded by living spaces to the front and the rear.

A condensing furnace requires a horizontal venting system that would require a PVC pipe to run through those living spaces at approximately eye level. It's simply not practical.

Additionally, many HOAs prohibit any changes to the building exterior and thus this remodeling project would be deemed illegal.

It is important to note that if the non-condensing furnace shares a venting system (chimney) with a water heater, changing to a condensing furnace will not only require a new dedicated vent for the furnace, it may also require that water heater to back draft combustion gasses.

One additional requirement for condensing furnaces is the need to capture and properly dispose of the condensate that is produced during the operation of these furnaces. Condensate management requirements of condensing furnaces adds to the homeowner's installation costs and may prevent the installation of condensing furnaces in certain unconditioned spaces if the threat of condensate freezing is an issue.

**Question 2:** *What options are available to address these technical challenges, such as different venting requirements?*

**Answer:** Addressed above.

**Question 3:** *What are the cost implications for homeowners faced with these challenges, and what realistic choices do they have?*

**Answer:** Re-routing the exhaust system may cost hundreds, if not thousands of dollars. The American Gas Association claims that this process could cost \$1,850-\$2,550.

May 14, 2015

Senator Lisa Murkowski (R-AK)  
Chairman, US Senate Committee on Energy and Natural Resources

Dear Senator Murkowski,

Many thanks again for the invitation to testify at the Committee on Energy and Natural Resources hearing on April 30, 2015 concerning "Energy Efficiency Legislation." I also appreciate you soliciting my thoughts for your additional questions for the record. Below I restate your questions (in *italics*), along with my responses.

**Question 1:** *You have previously stated that one-size-fits-all energy efficiency mandates ignore the diversity of preferences, financial resources and personal situations that energy consumers must consider when making purchasing decisions. One of the bills (S.1063) the Committee is considering would penalize retail electricity and natural gas suppliers if their customers do not save specified percentages of energy. What are your thoughts on such an approach?*

I think the approach proposed in S.1063 fits my description of a one-size-fits-all approach that results in unnecessarily high costs to achieve our aims. The proposed bill establishes a supplier-specific cap on electricity and natural gas delivery. It mandates that each retail electricity supplier reduce the amount of electricity it supplies, starting with a 1 percent reduction in 2017 and increasing to a 20 percent reduction in 2030 (all reductions relative to a baseline for each supplier of the three-year average prior to the first year of compliance). Each natural gas supplier must reduce the amount of natural gas not going to electricity by 0.50 percent in 2017, increasing to a 13 percent reduction in 2030. These are strict quotas on electricity and natural gas that apply individually to each supplier, which means there is no flexibility to allow different electricity or natural gas levels across suppliers. Across-supplier flexibility would lower costs (while maintaining the same overall cap) because sources could search for the lowest cost actions across the entire regulated sector. I think this inflexible approach is not economically sound.

**Question 2:** *The bills included in this hearing demonstrate a variety of ways that the Federal government might interact with stakeholders, such as encouraging the use of voluntary programs, prescribing standards, negating standards, providing grants, and encouraging regional interactions. In your opinion, what role should the Federal government play in energy efficiency efforts? What one thing, that it is not currently doing, could the Federal government do to make implementing energy efficiency measures or technology attractive to the people or organization you represent?*

As I stated in my testimony, I think the main reason for the government to regulate energy is to mitigate the environmental consequences of energy use, and that the most cost-effective way to do this is with a government sanctioned price on pollution. The approach taken by S.1063 highlights the problem with targeting electricity or natural gas through mandates rather than targeting pollution through prices. For one, the required reductions in electricity might be achieved by cutting back on clean forms of energy, such as wind and solar power. And by establishing facility-specific quotas rather than a price on pollution, total emissions could increase with the emergence of new (albeit regulated) facilities. It is also

conceivable that the optimal way to reduce greenhouse gases is to shift our transportation sector towards electric vehicles, which would mean we want more electricity rather than less in order to cost-effectively reduce greenhouse gas emissions. If the primary goal of energy efficiency legislation is to save people money (rather than to reduce pollution), then I would argue for voluntary programs and policies that provide clear information to consumers on their energy decisions. If people are making uneconomic energy decisions, then providing them information to make sounder decisions would be preferable than mandating standards that limit their choice.

Thank you, again, for the chance to appear before your committee and for soliciting my opinions on these follow-up questions. I am happy to provide more information at any time.

Sincerely,

Ted Gayer

**U.S. Senate Committee on Energy and Natural Resources  
April 30, 2015 Hearing: Energy Efficiency Legislation  
Replies from Mr. Steven Nadel to Questions for the Record**

**Questions from Chairman Lisa Murkowski**

**Question 1:** The bills included in this hearing demonstrate a variety of ways that the Federal government might interact with stakeholders, such as encouraging the use of voluntary programs, prescribing standards, negating standards, providing grants, and encouraging regional interactions. In your opinion, what role should the Federal government play in energy efficiency efforts? What one thing, that it is not currently doing, could the Federal government do to make implementing energy efficiency measures or technology attractive to the people or organization you represent?

*Reply:* The federal government can and does aid energy efficiency efforts in many ways. The federal government conducts pre-commercial research on new energy-saving technologies. Many important products have resulted. The federal government provides information and technical assistance on energy efficiency programs and policies to states, utilities, local governments and private parties, aiding their energy efficiency efforts. The federal government has the resources to provide such models and services and many states and localities lack these resources. Without some help, many fewer states and local governments can act. Also, when states work from a voluntary federal model, there are more opportunities for states to coordinate and learn from each other and similarities from state to state can make it easier for firms that market products and services in multiple states. In addition, the federal government establishes some uniform national policies, such as appliance and vehicle efficiency standards, that both save energy and aide interstate commerce since companies serving many states can better design equipment and services when key policies are uniform.

In terms of what the federal government could do that would really make a difference, I will mention two. First, the federal government could establish a national energy efficiency resource standard (EERS) as described in my testimony. Based on our past analyses, this would have a larger impact on energy savings than any of the other proposals before the Committee. A national EERS would save energy in all states and would also allow energy efficiency providers to expand their promotion activities since they know there will be a market in all states.

Second, the federal government should aid efforts to provide energy usage information to individual consumers and businesses, so that they can make more informed choices when they consider purchases of energy-efficiency services. This includes aiding building benchmarking and disclosure (e.g. S. 1052), E-Access as discussed below, and other ways better information can be provided to consumers such as improved appliance

**U.S. Senate Committee on Energy and Natural Resources  
April 30, 2015 Hearing: Energy Efficiency Legislation  
Replies from Mr. Steven Nadel to Questions for the Record**

energy labels. Enhanced information can help unleash the power of markets by enabling markets to function more efficiently.

**Question 2:** You have stated that ACEEE supports the E-ACCESS Act, which grants consumers and any third parties they designate access to their energy data. When this concept was first floated, I know Google was a major proponent. They have since ceased to have an active interest. To your knowledge, who are the associations or companies who are now actually proponents of the E-ACCESS Act and what do they intend to do with the data obtained through this bill?

*Reply:* It is my understanding that the E-Access supporters, in addition to ACEEE, include the following organizations and companies: Alliance to Save Energy, Digital Energy and Sustainability Solutions Campaign (DESSC), Information Technology Industry Council (ITI), Schneider Electric, Silicon Valley Leadership Group, EMC Corp, Environmental Defense Fund, EnerNOC, and the Home Performance Coalition. Regarding Google, we tried to contact them to clarify their current position but could not reach them. I note that they are members of both DESSC and ITI.

The bill will make it easier for consumers to access their own consumption data, allowing them to better understand their energy use and ways they can modify their use. The bill will provide data to companies that offer energy services *only if* an individual consumer authorizes that their data be shared. I am not aware of specific plans of specific companies to use this data when consumers share the data, but in general, companies could use such data to identify customers that could benefit from specific services. When consumption data by time of use is analyzed along with weather and other public data, propensities to benefit from specific efficiency measures can be identified. For example, if a customer's consumption shoots up more than the average customer on very hot days, this customer might benefit from improvements to their air conditioning system.

**U.S. Senate Committee on Energy and Natural Resources  
April 30, 2015 Hearing: Energy Efficiency Legislation  
Questions for the Record Submitted to Mr. Gene Therriault**

**Questions from Chairman Lisa Murkowski**

**Question 1:** *The bills included in this hearing demonstrate a variety of ways that the Federal government might interact with stakeholders, such as encouraging the use of voluntary programs, prescribing standards, negating standards, providing grants, and encouraging regional interactions. In your opinion, what role should the Federal government play in energy efficiency efforts? What one thing, that it is not currently doing, could the Federal government do to make implementing energy efficiency measures or technology attractive to the people or organization you represent?*

The task of implementing energy efficiency should be led by states and the private sector with collaborative support from federal agencies. In some instances, the Alaska Energy Authority has been frustrated by initiation of federal programs that are not integrated with state efforts. Such action leads to confusion and possible disregard for previous work resulting in duplication of effort.

The DOE Tribal Energy Program: Strategic Energy Planning project initially proposed action that appeared to be a duplication of AEA Regional Energy Planning. However, by working with DOE Alaska Program Manager, Givey Kochanowski, after the program was announced, the state and federal efforts were coordinated to be complimentary and less confusing to rural village residents. It would be ideal for federal law to require coordination and collaboration with individual states prior to initiation of programs.

The DOE Office of Indian Energy – Strategic Technical Assistance Response Program (START) and Tribal Energy - Technical Assistance Program offer additional examples of how close cooperation between federal agencies and states increases program effectiveness. The intention of START is to provide energy planning and project development assistance to Indian tribes, tribal energy resource development organizations, and other organized tribal groups and communities by connecting these local entities with DOE’s national labs and other technical expertise. The separate Technical Assistance Program provides 40 hours of aide in the operation of remote utility systems. These program were initially underutilized due to reliance on connecting out-of-state personnel directly with remote Alaska settings where they had no knowledge of existing energy infrastructure. In both cases, program effectiveness increased after DOE began to collaborate with AEA and use in-state technicians who possess knowledge about individual community leaders, infrastructure and capabilities. This level of collaboration

should be required up-front by all federal energy programs to avoid implementation difficulties and lack of effectiveness.

In addition to closer collaboration with states on energy programs, the federal government is encouraged to continue to establish energy standards for manufacturers of appliances and provide broad general energy efficiency education. Geographic and climatic differences between states should also be acknowledged by ensuring that home energy rating systems and software developed by states, which meet national standards, are recognized.

**Question 2:** *Alaska's energy efficiency programs have produced great energy and costs savings in rural communities. What do you see as the biggest challenge, other than a lack of funding, to implementing energy efficiency programs in rural communities in Alaska? How would you recommend we overcome that challenge?*

The remoteness of Alaska rural communities is a major hurdle to implementation of energy efficiency. This challenge can be diminished by closer collaboration between state and federal programs as highlighted in the response to question 1. In addition to collaboration between specific energy programs, inclusion of other federal efforts, such as the U.S. EPA Indian General Assistance Program (IGAP), may be beneficial.

The EPA IGAP program provides a federally-funded position in many communities to oversee development of a tribal/community environmental plan. Since importation and use of diesel, and other forms of liquid fuel, is a component of these plans, it may be advantageous for the scope of this position to be expanded to also assist with coordination of local energy matters, tribal and non-tribal. There could be tremendous value in having a single point of contact in communities for the purpose of not only coordinating among multiple implementation entities, but also for maintaining an accurate, comprehensive record of energy projects in that community.

**Question 3:** *You focus a great deal on the flexibility offered to the states through the State Energy Program. Are there lessons that we could learn in that regard that would inform our consideration of the bills that we are discussing including in a broad-based energy bill?*

Alaska is probably like most states in that we know our constituency, local energy markets and unique energy challenges. Allowing states to target funding to fill needs or exploit opportunities that are timely, and "place-specific," is an efficient use of funds.

The underlying statute that authorized SEP and the State Energy Efficiency Programs Improvement Act of 1990, are characterized by great flexibility. That is the key reason SEP has been successful throughout the country. The longstanding benefits of SEP and Weatherization have proven useful to the public. As referenced in my testimony of April 30<sup>th</sup>, the following bills exhibit the state flexibility necessary to make programs work: 1) the Weatherization Enhancement and Local Energy Efficiency Investment and Accountability Act (S. 703); 2) the Energy Productivity Innovation Challenge Act of 2015 (EPIC) (S. 893); 3) the Residential Energy Savings Act (RESA) (S. 878); and 4) the PREPARE Act (S. 888).

As referenced in the response to question number one, the Alaska Energy Authority used SEP funds to engage in and increase collaboration between the DOE Tribal START program and rural Alaska energy providers and consumers. Without SEP funds, the Authority would not have been able to engage DOE Tribal on behalf of the communities selected for this program. These are communities where AEA generally has intimate knowledge of the energy infrastructure because it was constructed with state assistance. The flexibility of the SEP funds enabled AEA to bring expertise to the discussion regarding development of renewable and efficiency projects in Alaska where the logistical and funding landscape is quite different than the continental United States. In this example SEP funds were leveraged to improve the success of state energy infrastructure projects and a DOE Tribal initiative with the ultimate outcome of better service for our rural communities.

For Weatherization, the intent of the bipartisan reauthorization bill (S. 703) is to support base program funding while also offering a complementary approach to help modernize it.

**Question 4:** *It is fair to say that the Weatherization Assistance Program (WAP) and the Low Income Home Energy Assistance Program (LIHEAP) are helpful to low-income families with high energy bills. What metrics are used to ensure that this money is being used effectively? Do you have any recommendations on how to improve the reporting and accountability of these programs?*

#### **WAP**

In the case of WAP, over 7.4 million homes have been weatherized since 1976. New technologies have been introduced (e.g., blower doors) and the program has improved over time. The last national evaluation of the WAP found that \$2.51 was returned for every dollar spent in energy and non-energy benefits over the life of the weatherized home. A new national evaluation is being completed in 2015.

In addition, WAP has recently taken steps to elevate the transparency and consistency of its entire operation by developing and requiring standardized work quality specifications, as well as worker certification and training across the program, defined for the network as Quality Work Plan requirements. The intent is that these products and policies can serve as a resource for the entire home energy performance industry, while ensuring that WAP remains a national leader in providing cost-effective services to its clients.

Grantees (state agencies) track information related to unit completion and submit these quarterly to DOE. Information in the report details total units completed, leveraged units completed with other leveraged funds, fuel type, and customers served who are elderly, disabled, have children in the home, have a high energy burden or are high energy users. The National Association for State Community Services Programs (NASCSPP) collects additional metrics annually for a leveraging report that is submitted to DOE. This report details additional units completed with leveraged funds under WAP.

In order to ensure funding is expended effectively in the WAP, 100 percent of completed units receive a final inspection. Additionally, state monitoring of completed units is required to ensure compliance with standards for quality and installation methods. A minimum of 5 percent of all completed units are required to be monitored by state agency program staff, including client files for specific administrative, fiscal, and procurement standards. Training is required for local providers to ensure consistency in installation practices and the health and safety of both workers and customers.

Measures are selected in each weatherized unit based on a comprehensive energy audit that uses computer simulations to identify cost-effective energy savings measures that will result in a positive return for the taxpayer investment. In some cases, homes need additional repairs to benefit from weatherization. If the needed repairs to ensure health and safety of occupants are too costly, the home may be deferred or LIHEAP funds may be used in some states to perform the non-energy saving investments to prevent deferral. Final inspections for each unit are then required.

With the policies outlined in the DOE Quality Work Plan, local providers are improving consistency and ensuring the level of quality workmanship expected for all units weatherized by the WAP.

As the WAP work is performed, some states employ sophisticated electronic intake, assessment and reporting systems while others find the implementation of such to be expensive and inflexible and therefore detrimental to the business practices of weatherization. Development of an open source tool by US DOE that could be adapted for use by the states may be worth examining.

As described above, WAP has embarked on major national initiatives, such as the Quality Work Plan, to build the quality and accountability of the program. DOE and state and local WAP offices need additional training and technical assistance resources to successfully implement these important initiatives. Regular evaluation and updating of the standard work specifications is necessary and should continue to include stakeholder feedback as a means of adopting new and innovative practices for saving energy through WAP.

### **LIHEAP**

Low-income families on average pay up to 15% of their incomes for home energy; about three times the rate of higher income families. LIHEAP works in tandem with WAP to help low-income families pay their energy bills as well as weatherize their homes to reduce their overall energy costs.

To improve overall program accountability, LIHEAP grantees have been working with the Administration on Children and Families (ACF), Office of Community Services (HHS) to develop and implement four performance measures that all states will be required to report beginning in FY' 16. These measures are designed to ensure that states are targeting grants to the neediest of families, and track the success of LIHEAP in preventing energy shut-offs and restoring energy services when they are disconnected. This data will be standardized across all LIHEAP grantees and clear metrics on the success of the program in meeting the energy needs of low-income families will be advanced.

The most recent data released by ACF for LIHEAP program statistics was for 2009. We would like to encourage ACF to release the data on a more timely basis to help improve the reporting of the program's performance.

### **Questions from Senator Joe Manchin**

I was happy to reintroduce the EPIC Act with Senator Warner this Congress. As you know, this bill establishes a competitive program to encourage states to improve energy productivity. This bill would lower energy bills and create jobs. America is blessed to have such an abundance of natural resources. It just makes sense to use these resources in the most efficient way possible. I appreciate your support of the bill and have a couple of questions.

**Question 1:** *Can you discuss the type of innovative programs that you are undertaking that could be expanded if the EPIC bill were to pass?*

The Alaska State Legislature created the Emerging Energy Technology Fund (EETF) in 2010 to promote the expansion of energy sources available to Alaskans. EETF grants are selected through a competitive process for demonstration of technologies that have a reasonable expectation of becoming commercially viable within five years. Projects can either:

- Test emerging energy technologies or methods of conserving energy
- Improve an existing technology
- Deploy an existing technology that has not previously been demonstrated in the state

For the EETF, energy technology is defined as technology that promotes, enhances, or expands the diversity of available energy supply sources or means of transmission or increases energy efficiency. Energy technology can include technologies related to renewable sources of energy, conservation of energy, enabling technologies, efficient and effective use of hydrocarbons and integrated systems.

Solicitations were held in 2012 and 2013 resulting in the selection of twenty projects for funding through the program. A future solicitation under the EETF program could be structured using a blend of state and federal funds, to focus specifically on increased efficiency of energy usage in Alaska.

Creation of a federal funding source, as proposed in the S 893, would be welcome as long as the “Minimum Funding” provision of the act is retained and structured to assure that federal support for existing state energy programs is not reduced to support this effort.

**Question 2:** *In drafting the EPIC Act, we wanted to recognize state differences and different state priorities. Do you believe the bill achieves those objectives?*

Yes. There appears to be adequate flexibility under the proposed “Uses” section of the bill to accommodate the differences in state approaches for energy efficiency and other programs and policies. Attention should be paid to maintaining this flexibility as the proposal is considered.



Office of the  
CHAIRMAN & PRESIDENT

April 29, 2015

The Honorable Lisa Murkowski  
Chairwoman  
Senate Committee on Energy & Natural Resources  
304 Dirksen Senate Office Building  
Washington, DC 20510

The Honorable Maria Cantwell  
Ranking Member  
Senate Committee on Energy & Natural Resources  
304 Dirksen Senate Office Building  
Washington, DC 20510

Dear Chairwoman Murkowski and Ranking Member Cantwell,

Recognizing the high cost of energy across rural Alaska and the crucial public health benefits of community sanitation, the Alaska Native Tribal Health Consortium (ANTHC) has developed an energy efficiency program focused on reducing operational costs of rural water and sewer systems. ANTHC's comprehensive program conducts energy audits to model energy use and identify opportunities for savings, implements appropriate energy efficiency improvements, provides energy efficiency training for local operators, both hands-on and in a formal vocational setting, and tracks performance and impacts of efficiency upgrades.

ANTHC currently has energy efficiency projects underway in 35 rural Alaskan communities. Funding for these current energy efficiency efforts has been provided by three primary sources: the Denali Commission, USDA Rural Development's Rural Alaska Village Grant Program 2% set-aside for technical assistance and training, and the State of Alaska.

There remain over 100 communities across rural Alaska that will not receive this service at current funding levels, all of them facing some of the highest energy costs in the nation. Continuation of our energy efficiency program, would allow ANTHC the capacity to serve 20 rural communities per year with an annual funding requirement of \$2.2M. Based on data from completed energy efficiency improvements, ANTHC's program will yield \$300,000 in annual electricity and heating fuel savings, and reduce CO<sub>2</sub> emissions by over 500 tons every year.

One example of the program's immediate and positive impact is illustrated through the energy efficiency efforts in the community of Pilot Station, Alaska. Since efficiency retrofits were implemented in November 2014, their sanitation system has seen a 66 percent reduction in fuel use and a 33 percent reduction in electricity use.

Our Vision:

Alaska Native people are the healthiest people in the world

**ALASKA NATIVE TRIBAL HEALTH CONSORTIUM**

4000 Ambassador Drive | Anchorage, Alaska 99508

907.942.1063

Page 2 of 2  
Chairwoman Murkowski  
Ranking Member Cantwell  
April 29, 2015

The following attachments, specific to ANTHC's work in Pilot Station, provide an example of the deliverables ANTHC's program creates for each community:

- 1) An energy audit report that analyzes energy usage and identifies opportunities for efficiency improvements
- 2) A training plan developed collaboratively with community and regional stakeholders to further define scope, outline training needs, and ensure impacts are sustained long-term
- 3) A follow up trip report identifying the completed efficiency measures, any remaining work, and any future improvement projects identified

ANTHC's energy efficiency program provides additional benefits to rural communities beyond energy savings. This program also promotes sustainability of vital community sanitation services damaged by the impacts of the harsh arctic environment and the effects of a changing climate, improves safety of equipment, and extends the life of aging infrastructure.

In addition to its energy efficiency efforts, ANTHC also works on behalf of Alaska's rural communities to identify, design and construct renewable energy solutions to reduce the high cost of rural sanitation systems. Integration of renewable energy as part of the solution to high operating costs serves to not only reduce system dependence on high-cost fossil fuels, but also leads to more affordable and sustainable residential water and sewer service. Alternative energy solutions employed by ANTHC include: heating water systems with recovered heat from community power plants, biomass heating using local wood resources, ground source heat pumps, hydro-electricity, and use of excess wind energy to heat sanitation systems.

The attached *ANTHC Rural Energy Initiative Four-Year Plan* defines the program's comprehensive goals and funding needs across all energy related activities. To fulfill the entirety of this plan's objectives would require annual funding of \$5.35M. This level of funding includes the above listed \$2.2M per year for energy efficiency, \$120,000 for performing feasibility studies of future renewable energy projects, \$2.63M to design and construct small renewable energy projects, and \$400,000 for remote monitoring of energy performance data.

Finally, the attached *ANTHC Rural Energy Initiative 2014 Report on Activities* summarizes the impacts of ANTHC's energy program, including details of several recently completed projects, a list of Alaskan communities which are being provided energy audits and efficiency upgrades, and specifics on energy and financial saving results.

Thank you for your time and consideration. Please contact me if you have any questions.

Sincerely,

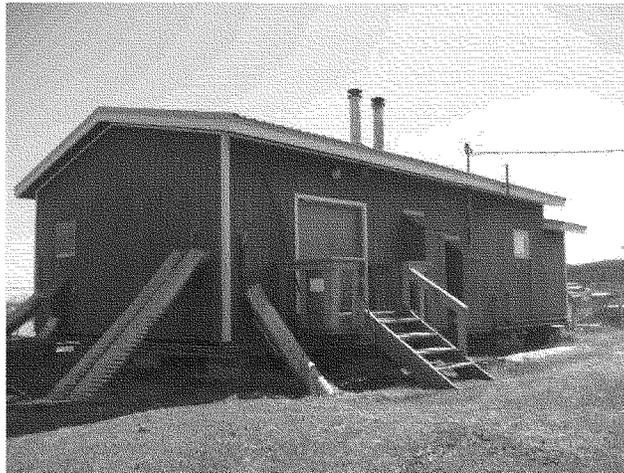


Andy Teuber  
Chairman and President

**Attachment 1**  
**Comprehensive Energy Audit for Pilot Station**  
**Water and Sewer System**



# Comprehensive Energy Audit For Pilot Station Water and Sewer System



---

Prepared For  
**City of Pilot Station**

**March 18, 2013**

Prepared By:

**ANTHC-DEHE**  
**3900 Ambassador Drive, Suite 301**  
**Anchorage, AK 99508**

**Table of Contents**

1. EXECUTIVE SUMMARY ..... 3

2. AUDIT AND ANALYSIS BACKGROUND ..... 5

    2.1 Program Description ..... 5

    2.2 Audit Description ..... 5

    2.3. Method of Analysis ..... 6

    2.4 Limitations of Study ..... 7

3. Pilot Station Water and Sewer System ..... 8

    3.1. Building Description ..... 8

    3.2 Predicted Energy Use ..... 10

        3.2.1 Energy Usage / Tariffs ..... 10

        3.2.2 Energy Use Index (EUI)..... 12

    3.3 AkWarm® Building Simulation ..... 13

4. ENERGY COST SAVING MEASURES ..... 14

    4.1 Summary of Results ..... 14

    4.2 Interactive Effects of Projects ..... 15

Appendix A – Listing of Energy Conservation and Renewable Energy Websites..... 19

Appendix B – Direct Vent Oil Heater Programming ..... 20

**PREFACE**

The Energy Projects Group at the Alaska Native Tribal Health Consortium (ANTHC) prepared this document for the Pilot Station Traditional Council. The authors of this report are Carl Remley, Certified Energy Auditor (CEA) and Gavin Dixon.

The purpose of this report is to provide a comprehensive document that summarizes the findings and analysis that resulted from an energy audit conducted over the past couple months by the Energy Projects Group of ANTHC. This report analyzes historical energy use and identifies costs and savings of recommended energy efficiency measures. Discussions of site specific concerns and an Energy Efficiency Action Plan are also included in this report.

**ACKNOWLEDGMENTS**

The Energy Projects Group gratefully acknowledges the assistance of the water plant staff and the tribal council.

**1. EXECUTIVE SUMMARY**

This report was prepared for the City of Pilot Station. The scope of the audit focused on Pilot Station Water and Sewer System. The scope of this report is a comprehensive energy study, which included an analysis of building shell, interior and exterior lighting systems, HVAC systems, and plug loads.

Based on electricity and fuel oil prices in effect at the time of the audit, the annual predicted energy costs for the buildings analyzed are \$17,136 for Electricity and \$19,671 for #1 Oil, with total energy costs of \$36,807 per year.

It should be noted that this facility received the power cost equalization (PCE) subsidy from the state of Alaska last year. If this facility had not received the PCE subsidy, total electrical costs would have been \$59,975.

Table 1.1 below summarizes the energy efficiency measures analyzed for the Pilot Station Water and Sewer System. Listed are the estimates of the annual savings, installed costs, and two different financial measures of investment return.

Table 1.1 PRIORITY LIST – ENERGY EFFICIENCY MEASURES						
Rank	Feature	Improvement Description	Annual Energy Savings	Installed Cost	Savings to Investment Ratio, SIR <sup>1</sup>	Simple Payback (Years) <sup>2</sup>
1	Other Electrical - Controls Retrofit: Tank Circulation Pump	Shut off circulation pump, unless town water use declines.	\$1,258	\$10	778.68	0.0
2	Other Electrical - Controls Retrofit: Well A Heat Tape	Shut off the well heat tape. The well pump operates on a VFD; heat tape should be only used for recovery.	\$2,140	\$500	26.49	0.2
3	Other Electrical - Controls Retrofit: Lift Station Electric Heating/ Heat Tapes	Shut off heat tape except when the line is frozen.	\$3,606	\$3,000	7.44	0.8
4	HVAC And DHW	Boilers need to be cleaned and tuned. A boiler should be isolated in spring and fall seasons to reduce losses and increase efficiency. The backup circulation pump should be valved off to reduce the load on the active circulation pump. Boilers should be shut off in mid May and turned back on in October.	\$1,361 + \$100 Maint. Savings	\$2,000	6.73	1.5

Table 1.1 PRIORITY LIST – ENERGY EFFICIENCY MEASURES						
Rank	Feature	Improvement Description	Annual Energy Savings	Installed Cost	Savings to Investment Ratio, SIR <sup>1</sup>	Simple Payback (Years) <sup>2</sup>
5	Circulation Loops	Heat add controls need to be fixed for circulation Loop #1. The loops should be set to 40 degrees and maintained at 40 degrees based on return temperature. Current copper service lines should be replaced with 150 feet of pex pipe and a small circulation pump in each home on the loop.	\$8,366 + \$1,000 Maint. Savings	\$78,500	1.10	9.4
	<b>TOTAL, cost-effective measures</b>		<b>\$14,731 + \$1,100 Maint. Savings</b>	<b>\$84,010</b>	<b>1.70</b>	<b>5.0</b>
The following measures were not found to be cost-effective:						
6	Other Electrical - Controls Retrofit: Lift Station Pumps and Controls	The pumps are currently running too often because of high ground water infiltration. Finding the source of the infiltration and stopping it will reduce pump run time, and keep the lagoon from over filling.	\$98	\$2,000	0.30	20.4
7	Window/Skylight: Water Plant	Replace existing window with U-0.35 wood window	\$0	\$329	0.00	999.9
8	Window/Skylight: Water Plant	Replace existing window with U-0.30 vinyl window	\$0	\$297	0.00	999.9
	<b>TOTAL, all measures</b>		<b>\$16,830 + \$1,100 Maint. Savings</b>	<b>\$86,637</b>	<b>1.66</b>	<b>5.1</b>

**Table Notes:**

<sup>1</sup> Savings to Investment Ratio (SIR) is a life-cycle cost measure calculated by dividing the total savings over the life of a project (expressed in today's dollars) by its investment costs. The SIR is an indication of the profitability of a measure; the higher the SIR, the more profitable the project. An SIR greater than 1.0 indicates a cost-effective project (i.e. more savings than cost). Remember that this profitability is based on the position of that Energy Efficiency Measure (EEM) in the overall list and assumes that the measures above it are implemented first.

<sup>2</sup> Simple Payback (SP) is a measure of the length of time required for the savings from an EEM to payback the investment cost, not counting interest on the investment and any future changes in energy prices. It is calculated by dividing the investment cost by the expected first-year savings of the EEM.

With all of these energy efficiency measures in place, the annual utility cost can be reduced by \$16,830 per year, or 45.7% of the buildings' total energy costs. These measures are estimated to cost \$86,637, for an overall simple payback period of 5.1 years. If only the cost-effective measures are implemented, the annual utility cost can be reduced by \$16,731 per year, or

45.5% of the buildings' total energy costs. These measures are estimated to cost \$84,010, for an overall simple payback period of 5.0 years.

Table 1.2 below is a breakdown of the annual energy cost across various energy end use types, such as Space Heating and Water Heating. The first row in the table shows the breakdown for the building as it is now. The second row shows the expected breakdown of energy cost for the building assuming all of the retrofits in this report are implemented. Finally, the last row shows the annual energy savings that will be achieved from the retrofits.

Description	Space Heating	Space Cooling	Water Heating	Lighting	Refrigeration	Other Electrical	Clothes Drying	Circulation Loops	Ventilation Fans	Total Cost
Existing Building	\$3,285	\$0	\$21	\$127	\$0	\$16,634	\$0	\$16,740	\$0	\$36,807
With All Proposed Retrofits	\$1,923	\$0	\$21	\$127	\$0	\$9,532	\$0	\$8,374	\$0	\$19,977
SAVINGS	\$1,361	\$0	\$0	\$0	\$0	\$7,102	\$0	\$8,366	\$0	\$16,830

## 2. AUDIT AND ANALYSIS BACKGROUND

### 2.1 Program Description

This audit included services to identify, develop, and evaluate energy efficiency measures at the Pilot Station Water and Sewer System. The scope of this project included evaluating building shell, lighting and other electrical systems, and HVAC equipment, motors and pumps. Measures were analyzed based on life-cycle-cost techniques, which include the initial cost of the equipment, life of the equipment, annual energy cost, annual maintenance cost, and a discount rate of 3.0%/year in excess of general inflation.

### 2.2 Audit Description

Preliminary audit information was gathered in preparation for the site survey. The site survey provides critical information in deciphering where energy is used and what opportunities exist within a building. The entire site was surveyed to inventory the following to gain an understanding of how each building operates:

- Building envelope (roof, windows, etc.)
- Heating, ventilation, and air conditioning equipment (HVAC)
- Lighting systems and controls
- Building-specific equipment
- Water consumption, treatment (optional) & disposal

The building site visit was performed to survey all major building components and systems. The site visit included detailed inspection of energy consuming components. Summary of building occupancy schedules, operating and maintenance practices, and energy management programs provided by the building manager were collected along with the system and components to determine a more accurate impact on energy consumption.

Details collected from Pilot Station Water and Sewer System enable a model of the building's energy usage to be developed, highlighting the building's total energy consumption, energy consumption by specific building component, and equivalent energy cost. The analysis involves distinguishing the different fuels used on site, and analyzing their consumption in different activity areas of the building.

Pilot Station Water and Sewer System is classified as being made up of the following activity areas:

1) Pilot Station Water Plant: 800 square feet

In addition, the methodology involves taking into account a wide range of factors specific to the building. These factors are used in the construction of the model of energy used. The factors include:

- Occupancy hours
- Local climate conditions
- Prices paid for energy

### ***2.3. Method of Analysis***

Data collected was processed using AkWarm© Energy Use Software to estimate energy savings for each of the proposed energy efficiency measures (EEMs). The recommendations focus on the building envelope; HVAC; lighting, plug load, and other electrical improvements; and motor and pump systems that will reduce annual energy consumption.

EEMs are evaluated based on building use and processes, local climate conditions, building construction type, function, operational schedule, existing conditions, and foreseen future plans. Energy savings are calculated based on industry standard methods and engineering estimations.

Our analysis provides a number of tools for assessing the cost effectiveness of various improvement options. These tools utilize **Life-Cycle Costing**, which is defined in this context as a method of cost analysis that estimates the total cost of a project over the period of time that includes both the construction cost and ongoing maintenance and operating costs.

**Savings to Investment Ratio (SIR) = Savings divided by Investment**

**Savings** includes the total discounted dollar savings considered over the life of the improvement. When these savings are added up, changes in future fuel prices as projected by the Department of Energy are included. Future savings are discounted to the present to account for the time-value of money (i.e. money's ability to earn interest over time). The **Investment** in the SIR calculation includes the labor and materials required to install the

measure. An SIR value of at least 1.0 indicates that the project is cost-effective—total savings exceed the investment costs.

**Simple payback** is a cost analysis method whereby the investment cost of a project is divided by the first year's savings of the project to give the number of years required to recover the cost of the investment. This may be compared to the expected time before replacement of the system or component will be required. For example, if a boiler costs \$12,000 and results in a savings of \$1,000 in the first year, the payback time is 12 years. If the boiler has an expected life to replacement of 10 years, it would not be financially viable to make the investment since the payback period of 12 years is greater than the project life.

The Simple Payback calculation does not consider likely increases in future annual savings due to energy price increases. As an offsetting simplification, simple payback does not consider the need to earn interest on the investment (i.e. it does not consider the time-value of money). Because of these simplifications, the SIR figure is considered to be a better financial investment indicator than the Simple Payback measure.

Measures are implemented in order of cost-effectiveness. The program first calculates individual SIRs, and ranks all measures by SIR, higher SIRs at the top of the list. An individual measure must have an individual  $SIR \geq 1$  to make the cut. Next the building is modified and re-simulated with the highest ranked measure included. Now all remaining measures are re-evaluated and ranked, and the next most cost-effective measure is implemented. AkWarm goes through this iterative process until all appropriate measures have been evaluated and installed.

It is important to note that the savings for each recommendation is calculated based on implementing the most cost effective measure first, and then cycling through the list to find the next most cost effective measure. Implementation of more than one EEM often affects the savings of other EEMs. The savings may in some cases be relatively higher if an individual EEM is implemented in lieu of multiple recommended EEMs. For example implementing a reduced operating schedule for inefficient lighting will result in relatively high savings. Implementing a reduced operating schedule for newly installed efficient lighting will result in lower relative savings, because the efficient lighting system uses less energy during each hour of operation. If multiple EEM's are recommended to be implemented, AkWarm calculates the combined savings appropriately.

Cost savings are calculated based on estimated initial costs for each measure. Installation costs include labor and equipment to estimate the full up-front investment required to implement a change. Costs are derived from Means Cost Data, industry publications, and local contractors and equipment suppliers.

#### ***2.4 Limitations of Study***

All results are dependent on the quality of input data provided, and can only act as an approximation. In some instances, several methods may achieve the identified savings. This report is not intended as a final design document. The design professional or other persons following the recommendations shall accept responsibility and liability for the results.

### 3. Pilot Station Water and Sewer System

#### 3.1. Building Description

The 800 square foot Pilot Station Water and Sewer System was constructed in 2005, with a normal occupancy of 1 people. The number of hours of operation for this building average 2 hours per day, considering all seven days of the week.

Water is sourced from a well, pumped with a VFD well pump up to the water storage tank. Water is treated with chlorine. Two circulation loops distribute water to the town. Many services off the loops are copper and freeze and break often.

A lift station low in the town pumps water up to a sewage lagoon in the middle of town.

The town uses about 1.2 million gallons of water per month.

#### Description of Building Shell

The exterior walls are six inch structurally insulated panels with 5.5 inches of polyurethane insulation.

The roof of the building is a warm roof with six inches of polyurethane insulation.

The floor of the building is built on pilings with six inches of polyurethane insulation.

Typical windows throughout the building are double paned vinyl frame windows, however two of the windows are broken.

Doors are metal with a polyurethane core.

#### Description of Heating Plants

The Heating Plants used in the building are:

##### Weil McLain WGO-07 Gold Oil Boiler #1

Fuel Type:	#1 Oil
Input Rating:	200,000 BTU/hr
Steady State Efficiency:	70 %
Idle Loss:	1.5 %
Heat Distribution Type:	Glycol
Boiler Operation:	All Year
Notes:	.85 gph, 140 PSI

##### Weil McLain WGO-07 Gold Oil Boiler #2

Fuel Type:	#1 Oil
------------	--------

## 167

Input Rating:	200,000 BTU/hr
Steady State Efficiency:	70 %
Idle Loss:	1.5 %
Heat Distribution Type:	Glycol
Boiler Operation:	All Year
Notes:	.85 gph, 140 PSI

### OM-148

Fuel Type:	#1 Oil
Input Rating:	148,000 BTU/hr
Steady State Efficiency:	93 %
Idle Loss:	0 %
Heat Distribution Type:	Water
Boiler Operation:	All Year

### Space Heating Distribution Systems

Unit heaters off the boilers supply heat to the facility.

### Domestic Hot Water System

An OM 148 Hot water heater is shut off at the breaker and never used.

### Lighting

Electronic T8 fluorescent lighting with 32 watt bulbs makes up all the lighting in the facility.

### Major Equipment

A VFD controlled well pump is operated 24/7, pumping about 28 gallons per minute of water at full throttle.

A tank circulation pump is currently operating, but valved off. The town uses water so quickly that the tank never fills completely and water is exchanged rapidly.

Two 5 horsepower circulation pumps circulate water in the town's two circulation loops.

An LMI chemical pump injects chlorine into the water supply.

A small heat tape is used to keep the building drain sump from freezing.

A long heat tape labeled Heat Tape A runs to the well.

The lift station operates a pair of grinder/discharge pumps, which at the time of the audit were set to operate based on a single float level. They were adjusted to have a high and low level settings.

The lift station has three heat tapes, one for the water service, one for the arctic box, and one for the force main up to the lagoon. Additionally the building is heated by a pair of electric heaters, which are set by hand at 60 degrees. The facility is in good condition and well insulated.

**3.2 Predicted Energy Use**

**3.2.1 Energy Usage / Tariffs**

The electric usage profile charts (below) represents the predicted electrical usage for the building. If actual electricity usage records were available, the model used to predict usage was calibrated to approximately match actual usage. The electric utility measures consumption in kilowatt-hours (kWh) and maximum demand in kilowatts (kW). One kWh usage is equivalent to 1,000 watts running for one hour.

The fuel oil usage profile shows the fuel oil usage for the building. Fuel oil consumption is measured in gallons. One gallon of #1 Fuel Oil provides approximately 132,000 BTUs of energy.

The following is a list of the utility companies providing energy to the building and the class of service provided:

Electricity: AVEC-Pilot Station - Commercial - Sm

The average cost for each type of fuel used in this building is shown below in Table 3.1. This figure includes all surcharges, subsidies, and utility customer charges:

Table 3.1 – Average Energy Cost	
Description	Average Energy Cost
Electricity	\$ 0.14/kWh
#1 Oil	\$ 7.32/gallons

**3.2.1.1 Total Energy Use and Cost Breakdown**

At current rates, City of Pilot Station pays approximately \$36,807 annually for electricity and other fuel costs for the Pilot Station Water and Sewer System.

Figure 3.1 below reflects the estimated distribution of costs across the primary end uses of energy based on the AkWarm® computer simulation. Comparing the “Retrofit” bar in the figure to the “Existing” bar shows the potential savings from implementing all of the energy efficiency measures shown in this report.

**Figure 3.1  
Annual Energy Costs by End Use**

[Type a quote from the document or the summary of an interesting point. You can position the text box anywhere in the document. Use the Text Box Tools tab to change the formatting of the pull quote text box.]

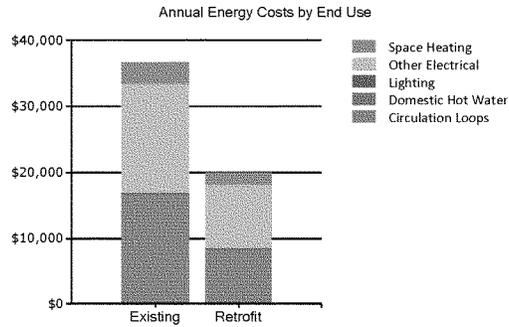


Figure 3.2 below shows how the annual energy cost of the building splits between the different fuels used by the building. The "Existing" bar shows the breakdown for the building as it is now; the "Retrofit" bar shows the predicted costs if all of the energy efficiency measures in this report are implemented.

**Figure 3.2**  
**Annual Energy Costs by Fuel Type**

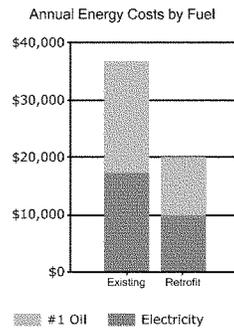
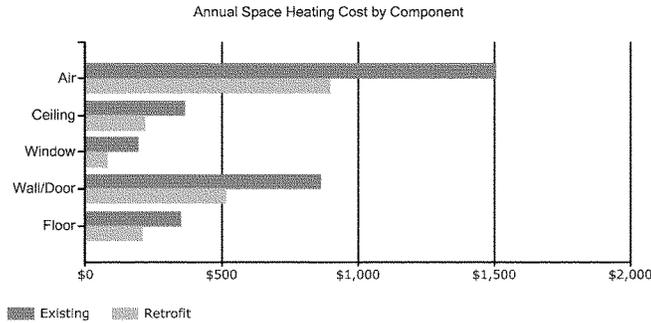


Figure 3.3 below addresses only Space Heating costs. The figure shows how each heat loss component contributes to those costs; for example, the figure shows how much annual space heating cost is caused by the heat loss through the Walls/Doors. For each component, the space heating cost for the Existing building is shown (blue bar) and the space heating cost assuming all retrofits are implemented (yellow bar) are shown.

**Figure 3.3**  
**Annual Space Heating Cost by Component**



The tables below show AkWarm’s estimate of the monthly fuel use for each of the fuels used in the building. For each fuel, the fuel use is broken down across the energy end uses. Note, in the tables below “DHW” refers to Domestic Hot Water heating.

Electrical Consumption (kWh)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Other Electrical	14101	12850	14101	13646	9512	5042	5210	5210	5042	6357	13646	14101
Lighting	77	70	77	75	77	75	77	77	75	77	75	77
Circulation Loops	0	0	0	0	0	0	0	0	0	0	0	0
Ventilation Fans	0	0	0	0	0	0	0	0	0	0	0	0
DHW	4	3	4	4	4	4	4	4	4	4	4	4

Fuel Oil #1 Consumption (Gallons)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Circulation Loops	469	427	469	454	0	0	0	0	0	0	0	469
DHW	0	0	0	0	0	0	0	0	0	0	0	0
Space Heating	34	31	34	33	34	33	34	34	33	34	33	34

**3.2.2 Energy Use Index (EUI)**

Energy Use Index (EUI) is a measure of a building’s annual energy utilization per square foot of building. This calculation is completed by converting all utility usage consumed by a building for one year, to British Thermal Units (Btu) or kBtu, and dividing this number by the building square footage. EUI is a good measure of a building’s energy use and is utilized regularly for comparison of energy performance for similar building types. The Oak Ridge National Laboratory (ORNL) Buildings Technology Center under a contract with the U.S. Department of Energy maintains a Benchmarking Building Energy Performance Program. The ORNL website determines how a building’s energy use compares with similar facilities throughout the U.S. and in a specific region or state.

Source use differs from site usage when comparing a building's energy consumption with the national average. Site energy use is the energy consumed by the building at the building site only. Source energy use includes the site energy use as well as all of the losses to create and distribute the energy to the building. Source energy represents the total amount of raw fuel that is required to operate the building. It incorporates all transmission, delivery, and production losses, which allows for a complete assessment of energy efficiency in a building. The type of utility purchased has a substantial impact on the source energy use of a building. The EPA has determined that source energy is the most comparable unit for evaluation purposes and overall global impact. Both the site and source EUI ratings for the building are provided to understand and compare the differences in energy use. The site and source EUIs for this building are calculated as follows. (See Table 3.4 for details):

$$\text{Building Site EUI} = \frac{(\text{Electric Usage in kBtu} + \text{Fuel Oil Usage in kBtu})}{\text{Building Square Footage}}$$

$$\text{Building Source EUI} = \frac{(\text{Electric Usage in kBtu} \times \text{SS Ratio} + \text{Fuel Oil Usage in kBtu} \times \text{SS Ratio})}{\text{Building Square Footage}}$$

where "SS Ratio" is the Source Energy to Site Energy ratio for the particular fuel.

**Table 3.4**  
**Pilot Station Water and Sewer System EUI Calculations**

Energy Type	Building Fuel Use per Year	Site Energy Use per Year, kBtu	Source/Site Ratio	Source Energy Use per Year, kBtu
Electricity	122,398 kWh	417,743	3.340	1,395,263
#1 Oil	2,687 gallons	354,726	1.010	358,274
<b>Total</b>		<b>772,470</b>		<b>1,753,537</b>
BUILDING AREA		800	Square Feet	
BUILDING SITE EUI		966	kBTU/Ft <sup>2</sup> /Yr	
BUILDING SOURCE EUI		2,192	kBTU/Ft <sup>2</sup> /Yr	
* Site - Source Ratio data is provided by the Energy Star Performance Rating Methodology for Incorporating Source Energy Use document issued March 2011.				

### 3.3 AkWarm© Building Simulation

An accurate model of the building performance can be created by simulating the thermal performance of the walls, roof, windows and floors of the building. The HVAC system and central plant are modeled as well, accounting for the outside air ventilation required by the building and the heat recovery equipment in place.

The model uses local weather data and is trued up to historical energy use to ensure its accuracy. The model can be used now and in the future to measure the utility bill impact of all types of energy projects, including improving building insulation, modifying glazing, changing air handler schedules, increasing heat recovery, installing high efficiency boilers, using variable air volume air handlers, adjusting outside air ventilation and adding cogeneration systems.

For the purposes of this study, the Pilot Station Water and Sewer System was modeled using AkWarm© energy use software to establish a baseline space heating and cooling energy usage.

Climate data from Pilot Station was used for analysis. From this, the model was calibrated to predict the impact of theoretical energy savings measures. Once annual energy savings from a particular measure were predicted and the initial capital cost was estimated, payback scenarios were approximated. Equipment cost estimate calculations are provided in Appendix D.

**Limitations of AkWarm® Models**

- The model is based on typical mean year weather data for Pilot Station. This data represents the average ambient weather profile as observed over approximately 30 years. As such, the gas and electric profiles generated will not likely compare perfectly with actual energy billing information from any single year. This is especially true for years with extreme warm or cold periods, or even years with unexpectedly moderate weather.
- The heating and cooling load model is a simple two-zone model consisting of the building’s core interior spaces and the building’s perimeter spaces. This simplified approach loses accuracy for buildings that have large variations in cooling/heating loads across different parts of the building.
- The model does not model HVAC systems that simultaneously provide both heating and cooling to the same building space (typically done as a means of providing temperature control in the space).

The energy balances shown in Section 3.1 were derived from the output generated by the AkWarm® simulations.

**4. ENERGY COST SAVING MEASURES**

**4.1 Summary of Results**

The energy saving measures are summarized in Table 4.1. Please refer to the individual measure descriptions later in this report for more detail. Calculations and cost estimates for analyzed measures are provided in Appendix C.

<b>Table 4.1</b> <b>Pilot Station Water and Sewer System, Pilot Station, Alaska</b> <b>PRIORITY LIST – ENERGY EFFICIENCY MEASURES</b>						
Rank	Feature	Improvement Description	Annual Energy Savings	Installed Cost	Savings to Investment Ratio, SIR	Simple Payback (Years)
1	Other Electrical - Controls Retrofit: Tank Circulation Pump	Shut off circulation pump, unless town water use declines.	\$1,258	\$10	778.68	0.0
2	Other Electrical - Controls Retrofit: Well A Heat Tape	Shut off the well heat tape. The well pump operates on a VFD, heat tape should be only used for recovery.	\$2,140	\$500	26.49	0.2
3	Other Electrical - Controls Retrofit: Lift Station Electric Heating/ Heat Tapes	Shut off heat tape except when the line is frozen.	\$3,606	\$3,000	7.44	0.8

Table 4.1 Pilot Station Water and Sewer System, Pilot Station, Alaska PRIORITY LIST – ENERGY EFFICIENCY MEASURES						
Rank	Feature	Improvement Description	Annual Energy Savings	Installed Cost	Savings to Investment Ratio, SIR	Simple Payback (Years)
4	HVAC And DHW	Boilers need to be cleaned and tuned. A boiler should be isolated in spring and fall seasons to reduce losses and increase efficiency. The backup circulation pump should be valved off to reduce the load on the active circulation pump. Boilers should be shut off in mid May and turned back on in October.	\$1,361 + \$100 Maint. Savings	\$2,000	6.73	1.5
5	Circulation Loops	Heat add controls need to be fixed for circulation. Loop #1 The loops should be set to 40 degrees and maintained at 40 degrees based on return temperature. Current copper service lines should be replaced with 150 feet of pex pipe and a small circulation pump in each home on the loop.	\$8,366 + \$1,000 Maint. Savings	\$78,500	1.10	9.4
<b>TOTAL, cost-effective measures</b>			<b>\$16,731 + \$1,100 Maint. Savings</b>	<b>\$84,010</b>	<b>1.70</b>	<b>5.0</b>
The following measures were <i>not</i> found to be cost-effective:						
6	Other Electrical - Controls Retrofit: Lift Station Pumps and Controls	The pumps are currently running too often because of high ground water infiltration. Finding the source of the infiltration and stopping it will reduce pump run time, and keep the lagoon from over filling.	\$98	\$2,000	0.30	20.4
7	Window/Skylight: Water Plant	Replace existing window with U-0.35 wood window	\$0	\$329	0.00	999.9
8	Window/Skylight: Water Plant	Replace existing window with U-0.30 vinyl window	\$0	\$297	0.00	999.9
<b>TOTAL, all measures</b>			<b>\$16,830 + \$1,100 Maint. Savings</b>	<b>\$86,637</b>	<b>1.66</b>	<b>5.1</b>

#### 4.2 Interactive Effects of Projects

The savings for a particular measure are calculated assuming all recommended EEMs coming before that measure in the list are implemented. If some EEMs are not implemented, savings for the remaining EEMs will be affected. For example, if ceiling insulation is not added, then savings from a project to replace the heating system will be increased, because the heating system for the building supplies a larger load.

In general, all projects are evaluated sequentially so energy savings associated with one EEM would not also be attributed to another EEM. By modeling the recommended project sequentially, the analysis accounts for interactive affects among the EEMs and does not “double count” savings.

Interior lighting, plug loads, facility equipment, and occupants generate heat within the building. When the building is in cooling mode, these items contribute to the overall cooling demands of the building; therefore, lighting efficiency improvements will reduce cooling requirements in air-conditioned buildings. Conversely, lighting-efficiency improvements are anticipated to slightly increase heating requirements. Heating penalties and cooling benefits were included in the lighting project analysis.

**4.3 Building Shell Measures**

**4.3.1 Window Measures**

Rank	Location	Size/Type, Condition	Recommendation		
7	Window/Skylight: Water Plant	Glass: Single, Glass Frame: Wood/Vinyl Spacing Between Layers: Half Inch Gas Fill Type: Air Modeled U-Value: 0.94 Solar Heat Gain Coefficient including Window Coverings: 0.52	Replace existing window with U-0.35 wood window		
<b>Installation Cost</b>		\$329	<b>Estimated Life of Measure (yrs)</b> 20	<b>Energy Savings (/yr)</b>	\$
<b>Breakeven Cost</b>		\$	<b>Savings-to-Investment Ratio</b> 0.0	<b>Simple Payback yrs</b>	1000
Auditors Notes:					

Rank	Location	Size/Type, Condition	Recommendation		
8	Window/Skylight: Water Plant	Glass: No glazing - broken, missing Frame: Wood/Vinyl Spacing Between Layers: Half Inch Gas Fill Type: Air Modeled U-Value: 0.94 Solar Heat Gain Coefficient including Window Coverings: 0.11	Replace existing window with U-0.30 vinyl window		
<b>Installation Cost</b>		\$297	<b>Estimated Life of Measure (yrs)</b> 20	<b>Energy Savings (/yr)</b>	\$
<b>Breakeven Cost</b>		\$	<b>Savings-to-Investment Ratio</b> 0.0	<b>Simple Payback yrs</b>	1000
Auditors Notes:					

**4.4 Mechanical Equipment Measures**

**4.4.1 Heating/Cooling/Domestic Hot Water Measure**

Rank	Recommendation	Installation Cost	Estimated Life of Measure (yrs)	Energy Savings (/yr)	Maintenance Savings (/yr)
4	Boilers need to be cleaned and tuned. A boiler should be isolated in spring and fall seasons to reduce losses and increase efficiency. The backup circulation pump should be valved off to reduce the load on the active circulation pump. Boilers should be shut off in mid May and turned back on in October.	\$2,000	10	\$1,361	\$100
<b>Breakeven Cost</b>		\$13,456	<b>Savings-to-Investment Ratio</b> 6.7	<b>Simple Payback yrs</b>	1
Auditors Notes:					

**4.5 Electrical & Appliance Measures**

4.5.1 Other Electrical Measures

Rank	Location	Description of Existing	Efficiency Recommendation
1	Tank Circulation Pump	Grundfos C4100 6063 P1 9818, 1.5 HP with Manual Switching	Improve Manual Switching
<b>Installation Cost</b>		\$10	<b>Estimated Life of Measure (yrs)</b> 7
<b>Breakeven Cost</b>		\$7,787	<b>Savings-to-Investment Ratio</b> 778.7
			<b>Energy Savings (/yr)</b> \$1,258
			<b>Simple Payback yrs</b> 0
Auditors Notes: Shut off circulation pump, as it is not needed. It should be used if there is trouble maintaining heat in the water storage tank, but currently the well pump is putting warm enough water into the tank, and water is getting used so quickly in the town that there is no need to even circulate water.			

Rank	Location	Description of Existing	Efficiency Recommendation
2	Well A Heat Tape	Well A Heat Tape with Manual Switching	Improve Manual Switching
<b>Installation Cost</b>		\$500	<b>Estimated Life of Measure (yrs)</b> 7
<b>Breakeven Cost</b>		\$13,245	<b>Savings-to-Investment Ratio</b> 26.5
			<b>Energy Savings (/yr)</b> \$2,140
			<b>Simple Payback yrs</b> 0
Auditors Notes: The heat tape is currently on all winter long. The well pump is on a VFD and is running almost 24/7. As long as the pump is running the heat tape can be off. A flow switch should be installed so that when the well pump shuts off in the winter time, the heat tape will turn on.			

Rank	Location	Description of Existing	Efficiency Recommendation
3	Lift Station Electric Heating/ Heat Tapes	3 Electric Heat Tapes, Two Electric Heaters with Manual Switching	Improve Manual Switching
<b>Installation Cost</b>		\$3,000	<b>Estimated Life of Measure (yrs)</b> 7
<b>Breakeven Cost</b>		\$22,325	<b>Savings-to-Investment Ratio</b> 7.4
			<b>Energy Savings (/yr)</b> \$3,606
			<b>Simple Payback yrs</b> 1
Auditors Notes: For the force main heat trace: The heat tape should be turned on only if the high level alarm and both pumps are running, or you are using a pumper truck. This line is an emergency heat tape, and should be shut off the majority of the time.			
For the water service heat trace: A small circulation pump (15-85W) should be put on the water line coming into the lift station and used in place of the heat tape. Additionally an RPZA needs to be installed on the water line to prevent sewage from accidentally flowing back from the lift station to the water main.			
Electric heaters in the facility should be set to 40 degrees, and only manually tuned up for comfort when working in the facility for extended periods. Otherwise there is no need to keep the facility heated above the freezing point.			

Rank	Location	Description of Existing	Efficiency Recommendation
6	Lift Station Pumps and Controls	2 Grinder/Discharge Pumps and Control Panels with Manual Switching	Improve Manual Switching
<b>Installation Cost</b>		\$2,000	<b>Estimated Life of Measure (yrs)</b> 7
<b>Breakeven Cost</b>		\$608	<b>Savings-to-Investment Ratio</b> 0.3
			<b>Energy Savings (/yr)</b> \$98
			<b>Simple Payback yrs</b> 20
Auditors Notes: Currently groundwater is infiltrating the system and supply about 25% of the water that is being pumped up to the lagoon. Finding the source of this groundwater and stopping it would reduce pump run time and help prevent the lagoon from flooding.			

4.5.2 Circulation Loop Measures

Rank	Location	Description of Existing	Efficiency Recommendation
5			Heat add controls need to be fixed for circulation Loop #1. turning the loop temperature up to 40 degrees does not prevent freezups, it only serves to use more fuel to heat leaking water. Old service lines and leaky mains are what is breaking and causing freezups, not too low of temperatures. The loops should be set to 40 degrees and maintained at 40 degrees based on return temperature. Because the lines are buried the heat losses through the circulation loops should be quite low. Current copper service lines should be replaced with 150 feet of pex pipe and a small circulation pump in each home on the loop. Assume one day of work for the operator and one local laborer, plus 3 hours of backhoe time per house. 40 houses. Provide three days of training for the operator on maintenance and heating demand of circulation loops and water service. (67,500 for project, 6,000 for training, 5,000 for two days fixing controls on loops in the plant.) Maintenance costs are based on reduced winter freeze up repairs.
<b>Installation Cost</b>	\$78,500	<b>Estimated Life of Measure (yrs)</b>	10
		<b>Energy Savings (/yr)</b>	\$8,366
		<b>Maintenance Savings (/yr)</b>	\$1,000
<b>Breakeven Cost</b>	\$86,321	<b>Savings-to-Investment Ratio</b>	1.1
		<b>Simple Payback yrs</b>	9
Auditors Notes:			

**5. ENERGY EFFICIENCY ACTION PLAN**

Through inspection of the energy-using equipment on-site and discussions with site facilities personnel, this energy audit has identified several energy-saving measures. The measures will reduce the amount of fuel burned and electricity used at the site. The projects will not degrade the performance of the building and, in some cases, will improve it.

Several types of EEMs can be implemented immediately by building staff, and others will require various amounts of lead time for engineering and equipment acquisition. In some cases, there are logical advantages to implementing EEMs concurrently. For example, if the same electrical contractor is used to install both lighting equipment and motors, implementation of these measures should be scheduled to occur simultaneously.

**Appendix A – Listing of Energy Conservation and Renewable Energy Websites**

**Lighting**

Illumination Engineering Society - <http://www.iesna.org/>

Energy Star Compact Fluorescent Lighting Program - [www.energystar.gov/index.cfm?c=cfls.pr\\_cfls](http://www.energystar.gov/index.cfm?c=cfls.pr_cfls)

DOE Solid State Lighting Program - <http://www1.eere.energy.gov/buildings/ssl/>

DOE office of Energy Efficiency and Renewable Energy - [http://apps1.eere.energy.gov/consumer/your\\_workplace/](http://apps1.eere.energy.gov/consumer/your_workplace/)

Energy Star – [http://www.energystar.gov/index.cfm?c=lighting.pr\\_lighting](http://www.energystar.gov/index.cfm?c=lighting.pr_lighting)

#### **Hot Water Heaters**

Heat Pump Water Heaters -  
[http://apps1.eere.energy.gov/consumer/your\\_home/water\\_heating/index.cfm/mytopic=12840](http://apps1.eere.energy.gov/consumer/your_home/water_heating/index.cfm/mytopic=12840)

#### **Solar Water Heating**

FEMP Federal Technology Alerts – [http://www.eere.energy.gov/femp/pdfs/FTA\\_solwat\\_heat.pdf](http://www.eere.energy.gov/femp/pdfs/FTA_solwat_heat.pdf)

Solar Radiation Data Manual – <http://rredc.nrel.gov/solar/pubs/redbook>

#### **Plug Loads**

DOE office of Energy Efficiency and Renewable Energy – [http://apps1.eere.energy.gov/consumer/your\\_workplace/](http://apps1.eere.energy.gov/consumer/your_workplace/)

Energy Star – [http://www.energystar.gov/index.cfm?fuseaction=find\\_a\\_product](http://www.energystar.gov/index.cfm?fuseaction=find_a_product)

The Greenest Desktop Computers of 2008 - <http://www.metaefficient.com/computers/the-greenest-pcs-of-2008.html>

#### **Wind**

AWEA Web Site – <http://www.awea.org>

National Wind Coordinating Collaborative – <http://www.nationalwind.org>

Utility Wind Interest Group site: <http://www.uwig.org>

WPA Web Site – <http://www.windpoweringamerica.gov>

Homepower Web Site: <http://homepower.com>

Windustry Project: <http://www.windustry.com>

#### **Solar**

NREL – <http://www.nrel.gov/rredc/>

Firstlook – <http://firstlook.3tiergroup.com>

TMY or Weather Data – [http://rredc.nrel.gov/solar/old\\_data/nsrdb/1991-2005/tmy3/](http://rredc.nrel.gov/solar/old_data/nsrdb/1991-2005/tmy3/)

State and Utility Incentives and Utility Policies - <http://www.dsireusa.org>

## **Appendix B – Direct Vent Oil Heater Programming**

Using the temperature setbacks built into most direct vent oil heaters, such as Toyotomi Lasers and Monitor MPIs is a simple, cost effective way to save energy. We recommend setback temperatures of 60 degrees for nights and weekends in offices and other frequently occupied facilities. In buildings that are occupied intermittently, such as Bingo Halls, we recommend a setback of 50 or 55 degrees. Facilities that are never occupied, such as lift stations and well houses, should be setback to 40 degrees, to prevent freezeups. Check the following websites for tips on programming the built in temperature setback capabilities of your specific direct vent oil heater.

[http://www.toyotomiusa.com/ownersManuals\\_ventedHeaters.php](http://www.toyotomiusa.com/ownersManuals_ventedHeaters.php)

<http://www.monitorproducts.com/customer-support/manuals>

**Attachment 2**  
**Pilot Station Training Plan (RAVG)**

## **Pilot Station Training Plan (RAVG)**

### **Operator Training Plan: Pilot Station**

**Reference:** Comprehensive Energy Audit for Water & Sewer System, completed March 18<sup>th</sup>, 2013 and preliminary pre-training planning trip taken April 23<sup>rd</sup> through April 25<sup>th</sup> 2014.

#### **Trainer:**

Martin Wortman, Utility Operation Specialist

#### **Pilot Station Personnel:**

Rex Nick, Water and Sewer System Operator / Mayor of Pilot Station

Alternate Water & Sewer Operator – (Ben Alick)

### **WATER & SEWER SYSTEM TRAINING**

#### **#1 Priority Item: Water Treatment Boilers**

Working with operators, training shall address:

1. Cleaning of boilers and oil fired burner units.
2. Proper set-up of oil burners to boiler manufacturer's O.E.M specification and settings.
3. Burner efficiency testing and optimization.
4. Acquire missing needed boiler testing tools & equipment (Note: community needs oil pump pressure gauge and vacuum testing pump)
5. Operation and use of burner combustion set-up and testing tools.
6. Schedule to manually reduce boiler operational temperature based on outside temperature and heat demand.
7. Schedule boiler operational summer shut down and individual boiler isolation and operation during early winter and spring to minimize heat loss and low heat load periods.
8. Identify proper cold boiler start-up procedures to prevent shock and possible damage to boilers.
9. Add labeling or tags to piping, valves and pumps for quick identification and maintenance.
10. Scheduling of annual boiler preventive maintenance and cleaning.
11. Develop list of boiler critical spare parts to order and stock.

## Pilot Station Training Plan (RAVG)

### #2 Priority Item: Water Treatment Plant Hydronic Heating System

Working with operators, training shall address:

1. Repair of defective heat add system controls - sensors, aqua stat controllers and solenoid valves for the water storage tank and distribution loops 1 & 2.
2. Verify proper operation of the building unit heaters and controls.
3. Repair of all hydronic piping and fitting leaks throughout plant.
4. Verify concentration and condition of propylene glycol within hydronic system.
5. Clean, repair or replace heat flow indicator / balancer and confirm proper operation.
6. Balance and set heat flows thru all heat exchangers and heating fixtures.
7. Clean or replace of all non-functioning auto air relief valves.
8. Add isolation valves under auto air reliefs to make cleaning and servicing during operation possible.
9. Verify expansion tank operation & proper pre-charge.
10. Purge air from heating system and provide procedures to maintain proper heat fluid pressure.
11. Venting heat circulation pumps and checking motor rotation.
12. Add check-valves to main heat pump manifold to prevent short circuit of flow.
13. Operators familiarize with basic heat transfer operation, control, trouble shooting and maintenance.
14. Set return loops to maintain 40 deg. F. return temp to minimize excessive heat loss and heating system fuel usage.
15. Basic understanding of hydronic heating system function and trouble-shooting.
16. Add labeling and directional flow arrows to hydronic piping and valves.
17. Hydronic system maintenance
18. Develop list of critical spare parts to order and stock.

### #3 Priority Item: Water Treatment Plant Fuel System

Working with operators, training shall address:

1. Procedures to identify and remove presence of water from double wall bulk fuel storage tank.
2. Second confinement fuel tank monitoring and draining. (Note: No proper plugs observed installed in low drain ports of secondary confinement) Provide plugs.
3. Replacement of equipment fuel filters.
4. Scheduling of annual fuel system preventive maintenance.
5. Develop list of fuel system critical spare filters and parts to order and stock.

## Pilot Station Training Plan (RAVG)

### #4 Priority Item: Sewer Lift Station

Working with operators, training shall address:

1. Label and provide directional arrows to piping and valves.
2. Provide lock to exterior mounted double throw switch to protect from vandalism and public access to inside panel.
3. Replace screens on exterior hood openings.
4. Identify local emergency auxiliary pump and fittings for lift station.
5. Identify local emergency electrical generator for lift station back-up power.
6. Schedule and procedures to monitor and minimize electrical heater use in lift station. Completely shut off during summer months.
7. Schedule and procedures to minimize or not use electrical heat tape on force main unless required for freeze recovery only.

### #5 Priority Item: Water Treatment Plant Building / Structure

Working with operators, training shall address:

1. Replace broken exterior entrance lights with LED outdoor flood lights.
2. Remove, insulate and seal old cooling duct hood for old emergency generator location in water plant. (generator was moved to out building)
3. Remove, insulate and seal opening to broken north window in plant.
4. Chalk and seal all pipe penetrations, windows and exterior panel joints on building.

### #6 Priority Item: Circulating Water Distribution Pump Loop 1&2

Working with operators, training shall address:

1. Adding labels and directional arrows to distribution piping and equipment.
2. Monitoring and identifying minimal required circulating flows and pressure in the distribution loops 1 & 2.
3. Scheduled flushing and cleaning of loops 1 & 2 return line Y- strainer.
4. Cleaning flow balancer and indicators and identifying and setting proper balanced heat-add flow thru heat exchanger.
5. Understanding difference of make-up water between loops 1 & 2. (Loop 1 make-up is after circulator pump and Loop 2 make-up before circulator pump on loop return. This creates different operational pressures when circulation pumps are operating)

### Pilot Station Training Plan (RAVG)

6. Replacement of non-functioning safety flow switches on loops 1 & 2 return lines – setup and make operational with alarm system.
7. Replacement of all faulty non-functioning isolation valves in loop.
8. Circulation Pump #2 on Loop 2 is leaking water from seal. Replace seal assembly - make operational again.
9. Replacement of defective cold temperature alarm controls for distribution loops 1 & 2
10. Replace defective / corroded pressure gauges on supply and return lines of loops 1 & 2. Add ¼" isolation valves to all pressure gauges.
11. Replacement of cracked 3"X 4" flanged rubber flex connectors on loops 1 & 2.
12. Circulating distribution system maintenance and flushing.
13. Develop list of critical spare parts to order and stock.

#### #7 Priority Item: Water Storage Tank and supply and return piping

Working with operators, training shall address:

1. Labeling and directional arrows to piping and lines inside WTP for water tank supply and return and heat add system.
2. Repair temperature controls for tank heat add to make operational and automatic controlling to maintain minimal operating temperature.
3. Repair / replace defective cold temperature alarm controls and flow switch for water storage tank and tank loop piping heat-add system.
4. Determining solution for repair of the existing non-functioning electrical recovery heat trace on supply and return piping from building to water storage tank.
5. Schedule inspection of interior WST for corrosion and tank metal condition. Note: This is not directly part of the RAVG funding relating to the energy audit but a direct concern and requirement for the operation of entire system.
6. Reseal and insulate holes in insulated man-way hatch cover, tank skin and tank's arctic valve box.
7. Identify and provide a replacement tank level gauge.
8. Develop list of critical spare parts to order and stock.

#### #8 Priority Item: Emergency Backup Generator and Building

Working with operators, training shall address:

1. Rehabilitation of the existing heat system feeding building to make operational and controlled. Work to include:
  - a) Replacement of existing 1" HDPE heat loop lines to 1" PEX heat tubing with O2 barrier.
  - b) Install heat controls for heat loop.
  - c) Install expansion tank for heat loop

### Pilot Station Training Plan (RAVG)

- d) Install additional auto air venting on WTP side of loop.
  - e) Confirm operation of building unit heater and temperature control switch for fan.
  - f) Repair all leaks on heat loop.
2. Provide lock for building's exterior electrical disconnect switch.
  3. Install exterior entrance lighting with LED outdoor flood light.
  4. Provide battery for generator.
  5. Provide battery maintainer / trickle charger.
  6. Identify generator start-up and operational procedures.
  7. Start-up and functionally test generator.
  8. Identify required generator preventive maintenance.
  9. Replace generator oil, filters and check belts.
  10. Establish scheduled monthly operation and test schedule.
  11. Develop list of critical spare parts and filters to order and stock for emergency generator system.

#### #9 Priority Item: Water Treatment

Working with operators, training shall address:

1. Labeling and directional arrows to filter piping and valves.
2. Repair #1 Filter piping to make operational again.
3. Repair leaks in filter piping.
4. Replace corroded or non-existent filter differential gauges
5. Replace all faulty flow switches and incorrect installation tee adapters to make chemical pump control circuit operate automatically from well water / treatment flow. Currently chemical pumps are operated and controlled manually by operator.
6. Replace corroded pressure relief valves on well lines. (to prevent possible overpressure and damage to well supply lines in event of closed treatment valve)
7. Identify materials and components needed to add a chlorine mix / settling tank to minimize operator's chlorine gas exposure and corrosion throughout the WTP.
8. Test raw water for current levels of iron and manganese.
9. Evaluate filter media and existing water treatment process.
10. Consider relocating chlorine injection point upstream of water treatment to enhance oxidation of the iron present in Well "A" water so filters can better remove iron during treatment and provide better water quality.
11. Develop list of critical spare parts to order and stock for water treatment.

## **Pilot Station Training Plan (RAVG)**

### **#10 Priority Item: Wells / Water Source**

#### **Well "A" Primary Main Water Source**

Working with operators, training shall address:

12. Test & clarify electrical heat trace use & operation to minimize electrical consumption.
13. Repair well site fencing. (Water Source protection)
14. Lock well site disconnect switchbox – protect public from electrical contacts access.
15. Repair treated plywood weather protection cover for well site load center & disconnect switch.
16. Provide cover for buried valve boxes.
17. Verify replacement spare well pump on hand.

#### **Well "B" Alternate Water Source**

Working with operators, training shall address:

1. Test & clarify electrical heat trace use & operation. Note: Well "B" only used as back up in event well "A" is not producing.

#### **Well "C" Alternate Water Source**

Working with operators, training shall address:

1. Test & clarify electrical heat trace use & operation. Note: Well "C" only used as back up in event well "A" is not producing.

### **REGIONAL TRAINING**

#### **Avtec Training**

Community utility operators were invited to participate in AVTEC - May 12<sup>th</sup> through May 23<sup>rd</sup> 2014 emphasizing ADEC certification to the provisional water treatment and water distribution which also includes hands on skills training for oil fired boiler operation maintenance, HDPE pipe fusion, copper pipe fitting and soldering, basic electrical controls and water plant filter treatment process. Participation in training was declined. Primary operator already holds certification and the alternate operator had other conflicting preset schedules. We will encourage operators to participate in the second AVTEC training scheduled August 4<sup>th</sup> through August 15<sup>th</sup> 2014.

**Attachment 3**  
**Pilot Station RAVG Operator Training**  
**Trip Report**

**Alaska Native Tribal Health Consortium**

Division of Environmental Health and Engineering  
3900 Ambassador Drive • Suite 301 • Anchorage, Alaska 99508 • Phone: (907) 729-3600 • Fax: (907) 729-4090 • www.anthc.org

**MEMORANDUM**

**DATE:** November 7, 2014  
**FROM:** Tribal Utility Support Specialist  
**SUBJECT:** Trip Report, Pilot Station – Rural Alaska Village Grant (RAVG) Operator Training –  
October 7-17, 2014  
**TO:** FOR THE RECORD

**TRAVEL:**

10-7-14 depart Anchorage @ 11:30 a.m. arrive Pilot Station @ 2:15 p.m.  
10-17-14 depart Pilot Station @ 10:00 a.m. arrive Anchorage @ 2:50 p.m.

**OBJECTIVE:**

1. To address the 2013 water and sewer system energy audit recommendations referenced in the April 23<sup>rd</sup> - April 25<sup>th</sup> field trip training planning and the March 18, 2013 water and sewer system energy audit recommendations.
2. To work with the city's water and sewer utility operators on heat system improvements, energy upgrades and training. Training itemized and referenced in the April 2014 Pilot Station RAVG Training Plan. (See attached and edited training plan for all completed tasks.)

**CONTACTS:**

Mr. Rex Nick, Mayor/Water and Sewer Utility Operator  
Mr. Ben Alick, Alternate Water and Sewer Operator  
Mrs. Anita Meyers, City Utility Manager  
Mrs. Ruth Borromeo, City Administrator  
Mr. Gabe Heckman, Equipment Operator/Mechanic  
Mr. Arnold Nick, Temporary Utility Worker  
Mr. Jered Makaily, Temporary Utility Worker

**ACCOMPANIED BY:**

Mr. Kameron Hartvigson, Associate Tribal Utility Operations Specialist, Alaska Native Tribal Health Consortium (ANTHC)

FINDINGS AND ACCOMPLISHMENTS:

Mr. Hartvigson and I arrived early the afternoon of October 7<sup>th</sup>. The weather was mostly clear and the temperature was slightly above freezing. We chartered Yute Air 207 to haul all of our gear, tools and materials. Also included in the charter were materials we had shipped earlier through Everts Air Cargo and held in Bethel.

We were met at the runway by the city Operator Heckman. Mr. Heckman transported us to the city where we met up with Mayor Rex Nick.

Mr. Nick and I discussed our trip objectives and scheduled the work and training for the following morning. All the previously shipped parts and materials had been hauled to the water treatment plant and staged inside the building. The alternate Utility Operator Ben Alick was called and scheduled to come in the following morning. Utility Specialist Hartvigson and I went to the water plant, unpacked and inventoried all the materials shipped and received on-site. We reviewed the training plan and started planning out repair and training activities. We made arrangements to stay in the city's ATCO construction trailer housing units.

I observed the city had already started the late fall sewer lagoon discharge and also had worker grubbing and removing all the over grown grass and willows inside the lagoon fence line. Apparent earlier cold freeze had developed a floating sheet of ice in the lagoon.

With the direct assistance and support of both local Utility Operators Rex Nick (Mayor/Operator), Ben Alick (Alternate Operator) and additional assistance from the temporary city hires Arnold Nick and Jered Makaily, we worked 10-12 hours days from October 8<sup>th</sup> through October 16<sup>th</sup> to finish out most of the training items outlined in attached April 2014 RAVG Pilot Station Training Plan. Training plan items were developed using the March 2013 Water and Sewer Energy Audit recommendation. See attached training plan for details. We finished our training efforts the morning of October 17<sup>th</sup> and departed Pilot Station at about 10:00 a.m.

ITEMS NOT LISTED OR OUTSTANDING OF TRAINING PLAN:

1. It was observed during functional testing the water plant back-up generator is providing over voltage and possible over frequency cycling. When power was switched over to the generator the soft starts for the loops #1 and #2 faulted. Voltage readings were 218 between lines and 125 volts line to ground. I did not have a cycle meter to check frequency. No generator operation manual was readily available so we did not attempt to make adjustments. I informed Mr. Nick about the importance of locating the generator manual so power adjustment could be completed.
2. The re-commissioned generator building heat system is insufficient to maintain minimal temperatures inside the generator building. I observed it was difficult to maintain 40 degrees F. inside the building when the outside temperature was 25 degrees F. The existing heat exchanger is undersized or the unit heater inside the building is too small. Options would be:  
a) to provide and install a larger heat exchanger or b) remove and pump the boiler glycol

hydronic fluid directly to the generator building unit heater bypassing the heat exchanger system.

3. During the heat system's rehab work it was observed the existing hydronic system has deposits, scales and sediment build-up at different locations throughout. Some local flushing and cleaning was accomplished during the training. Heat transfer is operating but a dedicated complete drain-down, flushing, cleaning with detergent and recharge with fresh glycol would benefit the heating system.
4. The new replacement Beckett AFG oil burners provided were supplied with incorrect primary safety relays. The relays are currently 2 minute post-purge versus the 15 second model originally requested.
5. The replacement combo vacuum/pressure gauges for the fuel system's automatic day-tank were not liquid filled as originally specified. The pump vibration will cause premature gauge failure.
6. The alarm system panel was tested and checked with all newly replaced flow switches and low temperature signals. No operational audible alarm was observed to notify of an alarm condition.
7. All fluorescent light fixtures throughout the water plant were rewired and changed out with 4 foot LED tubes.
8. The light bulbs in fixtures of the generator and lift station building were observed as compact fluorescent (CF). Although energy efficient CF bulbs are dim at start and effected by cold temperature. Replacement LED bulbs would not be effected by the cold and would slightly improve efficiency.
9. The insulation on piping was removed during repairs, valve replacement and piping alterations. Existing and new insulation was refitted to most areas. Utility operators are finishing out the remainder of the pipe insulation work.
10. Some additional labeling was added on the piping inside the water plant but not all could be completed until the pipe insulation is finished. Directional labels were provided and additional labels were located on-site. A small portable labeler unit was provided and left with the utility operators so they could create custom labels. Pilot Station operators were encouraged to add labels as needed to make identification, operation and maintenance easier.
11. I discussed the benefit of using oxidation and media filters to enhance the water treatment quality. We provided assistance to add and change-out faulty valves on the media filter piping to make filter #1 functional and enable backwash procedures for both filters. Filter #1 was observed dirty with small size sediment during backwashing and suspect multiple backwash cycles would be required to thoroughly clean up the media. I suspect filter #2 is also dirty and will require the same procedure. The chlorine injection was relocated

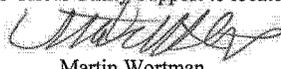
upstream of filters to improve oxidation process and enhance removal of elevated iron content from the well "A" raw water. No iron or manganese test kit was located on-site for testing water.

12. I discussed chlorine handling and operational improvements with Mr. Nick. He was very interested in setting up an elevated chlorine mix/decant/settling vat to minimize the chlorine gas exposure and cleaning of the chlorine pump check valves. Also I observed he did not have spare chemical injection quills, tubing and check valves.
13. The non-functioning thaw recovery heat tape for the fill and draw lines from water plant to the water storage tank (WST) was not investigated further during this training trip. The operators will need to monitor heat add circulation to the WST to prevent freezing. I speculate the heat trace will require full replacement.
14. The interior of the WST still requires further investigation to determine the corrosion level inside of the tank. Note: Pictures taken during the March 2013 audit trip and April 2014 RAVG training plan trip capture imaged inside of WST showing corrosion along lower tank wall.
15. The Mayor Nick informed me he suspects he has a water leak in distribution #1 loop. I shared with him to request assistance from the remote maintenance worker and acquire a leak detection device to help locate the buried leak. I suggested late fall or early winter might be a good time for the city to attempt efforts to locate and repair a leak before the ground freezes hard, snow covers and cold weather prohibits equipment operation. Repair might be cheaper versus trying to manage the leak through the winter, wasting energy pumping and heating excess water through a leaking system.

#### RECOMMENDATIONS AND/OR CONCLUSIONS:

1. If funds are available the ANTHC needs to perform a RAVG follow-up trip to work with the utility operators to address:
  - a. Emergency generator over voltage and cycles adjustment to make functional.
  - b. Re-plumb heating system to generator building to produce higher heat fluid temperatures and maintain a warmed emergency generator.
  - c. Drain, flush, clean and replace hydronic heating fluid (propylene glycol on-site).
  - d. Provide and replace incorrect oil safety relays for oil burners.
  - e. Diagnose and repair alarm system's audible alarm /horn.
2. RAVG effort to provide correct replacement liquid filled vac/pressure gauges for auto day-tank fuel system. The water plant operators can install the gauges.

3. RAVG effort to provide 4 each blank 4-inch X 4-inch electrical box covers for the heat controller wiring.
4. RAVG effort provides LED bulb replacements for standard 75-100 watt incandescent bulbs light fixtures at lift station and generator building. Utility maintenance operators can install.
5. The ANTHC Tribal Utility Support (TUS) to assist the community to identify specification and information for an iron and manganese kits for chlorine feed rate injection, water treatment testing and monitoring. The city will be responsible to purchase kits and we will assist with training for their use.
6. The ANTHC TUS to assist the community to identify and order critical spare chemical injection pump parts, hoses and fittings. Parts to include fittings, mixer and materials to set up chlorine mixing and decant vat. The city will be responsible to purchase items and we will assist with training for their use.
7. The City of Pilot Station to request assistance from the Yukon Kuskokwim Health Corporation Remote Maintenance Worker, the ANTHC Project Manager and the ANTHC TUS to address repair solutions for recovery heat tape on the WST's lines from the water plant.
8. The City of Pilot Station to request assistance from the YKHC Remote Maintenance Worker, ANTHC Project Manager and ANTHC Tribal Utility Support for cleaning and inspection inside the WST and verify possible corrosion concern.
9. The City of Pilot Station to request assistance from the YKHC Remote Maintenance Worker, ANTHC Project Manager and ANTHC Tribal Utility Support to locate and repair possible distribution line leak.

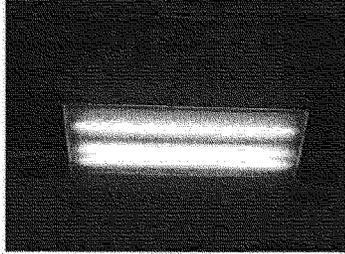


Martin Wortman

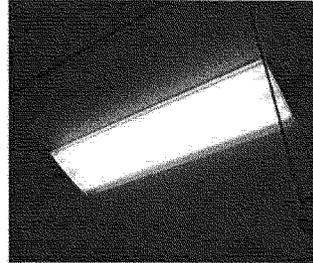
## Attachments:

Post Pilot Station RAVG Training Report  
Pictures

- cc: Rex Nick, Mayor/Water & Sewer Utility Operator, City of Pilot Station  
Anita Meyers, Utility Manager, City of Pilot Station  
Ruth Borromeo, Administrator, City of Pilot Station  
Gabe Heckman, Equipment Operator/Mechanic, City of Pilot Station  
Billy Westlock, RMW, YKHC, Bethel  
Allan Paukin, RMW, YKHC, Bethel  
Carrie Bohan, OAP Manager, ADEC, Juneau
- cc: DEHE - John Hutchinson/Carl Remley/  
Gavin Dixon/Pierre Costello/  
Michael Black/David Lewshenia



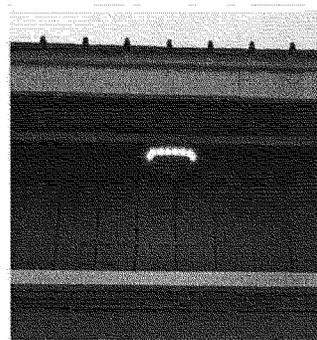
Before  
4' Fluorescent bulb fixture



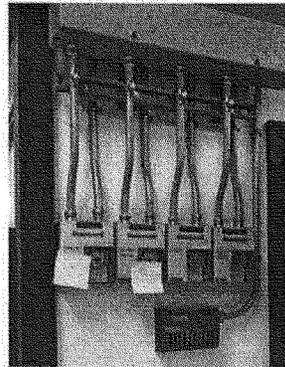
After  
4' LED bulb change out



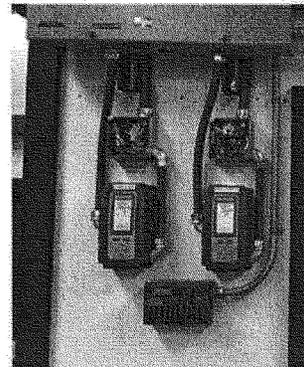
Before  
High pressure sodium entrance light



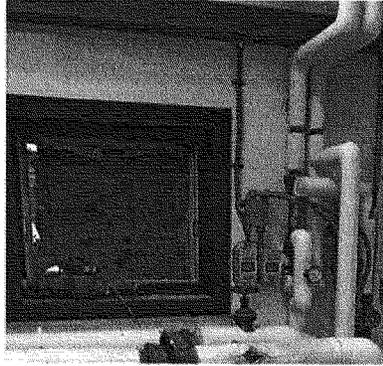
After  
LED entrance light change-out



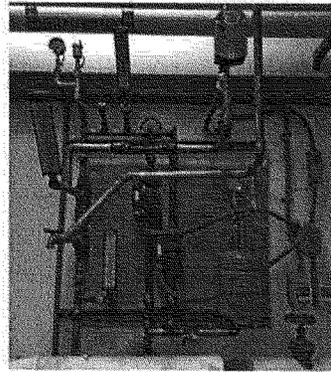
Before  
discontinued temp and alarm control



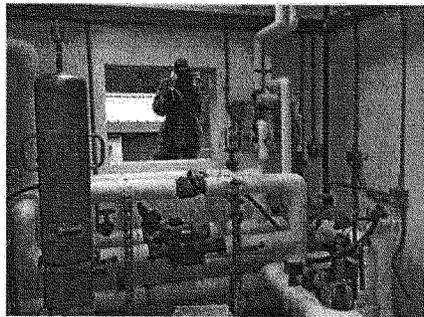
After  
new controller – each controls heat and alarm



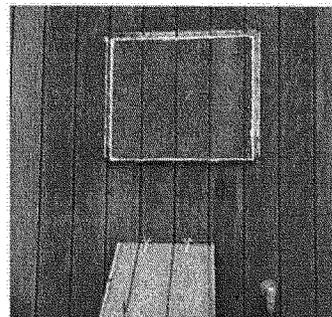
Before  
broken N. window & generator heat add



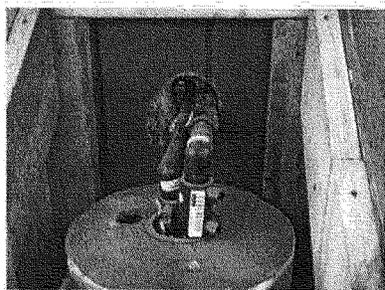
After  
window seals & rehabbed generator heat add



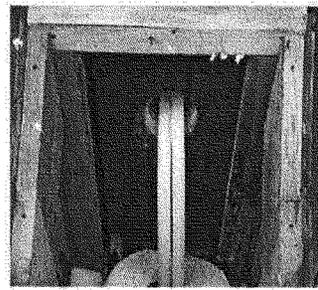
window removed



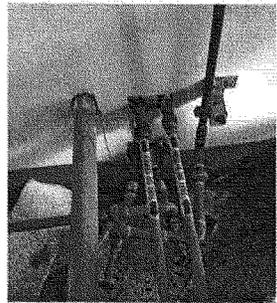
opening insulated & sealed



1" HDPE heat pipe



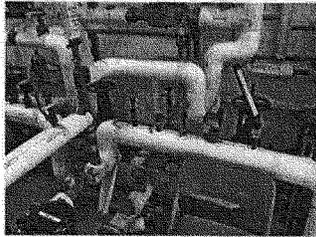
replaced with 1" Heat Pex



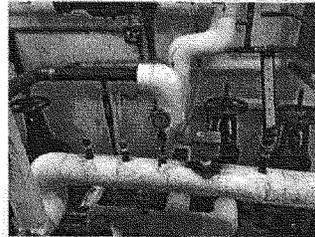
leaking heat pipe in generator bld.



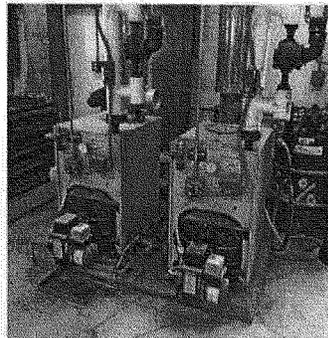
Refitted transition to HEPex



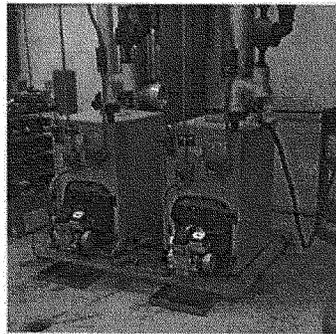
corroded thermo-well and flow switch



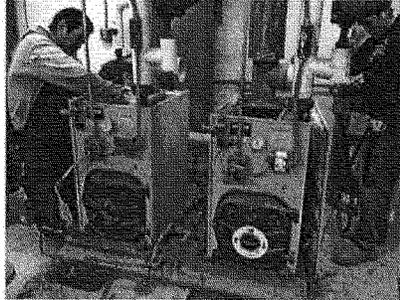
new thermo-well, psi gauge and flow switch  
note: flow switch is NEMA 4 sealed case



Boilers before  
Old burners - no purge function



Boilers after  
new tuned AFG oil burners with pre & post purge



Opening up boilers for cleaning



sooted flue passage inside boiler section



Boiler #1

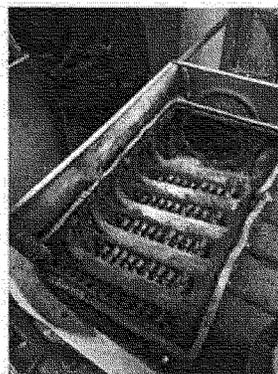


Boiler #2

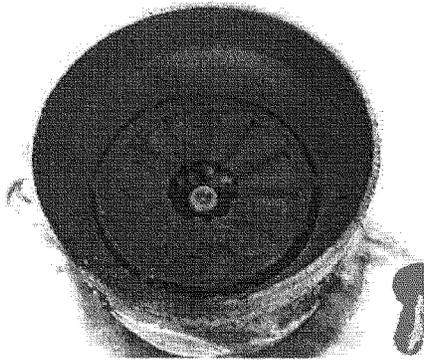
Brushing and cleaning out soot



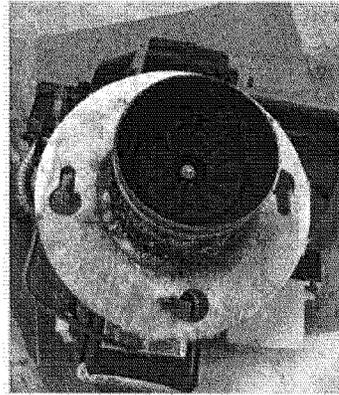
#1 cleaned flue passage



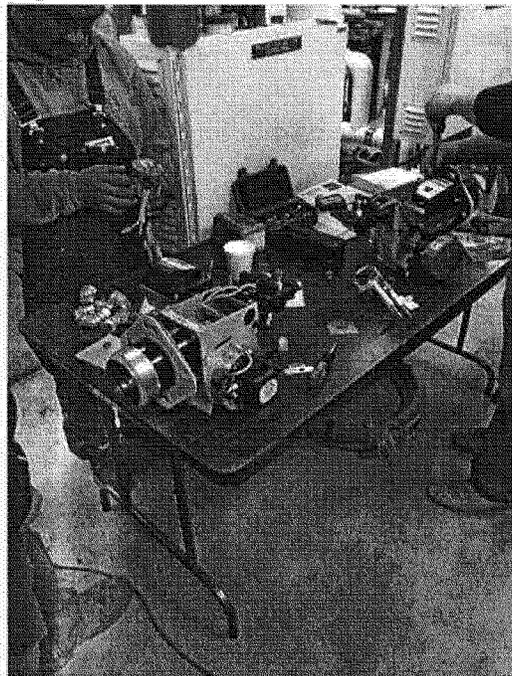
#2 cleaned flue passag



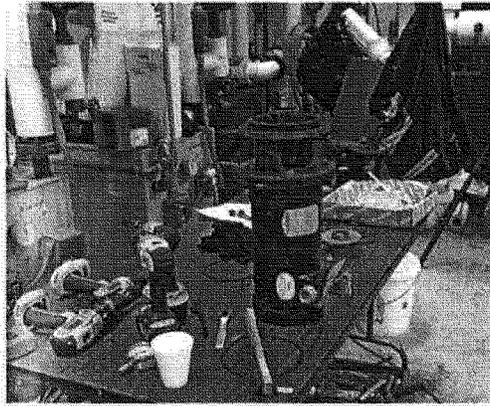
Old #1 sooted gun



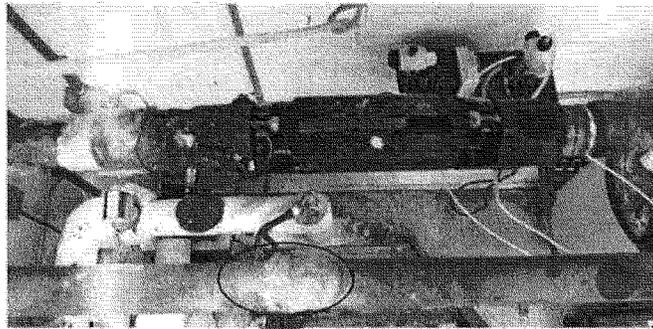
Old #2 sooted gun



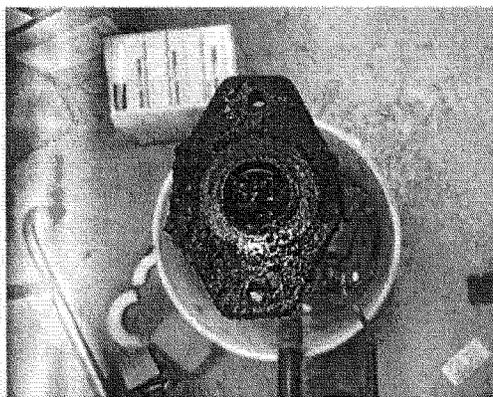
Assembly and set up of new Beckett AFG oil fire burner guns  
Review controls, oil burner components and operating fundamentals



Loop 1 - #2 circulation pump - seal kit installation



Original boiler hydronic lines for generator heat exchanger  
Note: extreme corrosion and leak caused by dripping chlorine injection point located directly overhead. Piping was relocated.



Worst example of hydronic heat lines corrosion observed

[Type text]

**Pilot Station Training Plan (RAVG)**

[Type text]

**Operator Training Plan: Pilot Station**

**Reference:** Comprehensive Energy Audit for Water & Sewer System, completed March 18<sup>th</sup>, 2013 and preliminary pre-training planning trip taken April 23<sup>rd</sup> though April 25<sup>th</sup> 2014.

**Trainer:**

Martin Wortman, Utility Operation Specialist

**Pilot Station Personnel:**

Rex Nick, Water and Sewer System Operator / Mayor of Pilot Station

Alternate Water & Sewer Operator – (Ben Alick)

**WATER & SEWER SYSTEM TRAINING**

All completed and finished items are highlighted in yellow.

Explanation notes and details in red following listed item.

**#1 Priority Item: Water Treatment Boilers**

Working with operators, training shall address:

1. Cleaning of boilers and oil fired burner units.
2. Proper set-up of oil burners to boiler manufacturer's O.E.M specification and settings.
3. Burner efficiency testing and optimization.
4. Acquire missing needed boiler testing tools & equipment (Note: community needs oil pump pressure gauge and vacuum testing pump)
5. Operation and use of burner combustion set-up and testing tools.
6. Schedule to manually reduce boiler operational temperature based on outside temperature and heat demand.
7. Schedule boiler operational summer shut down and individual boiler isolation and operation during early winter and spring to minimize heat loss and low heat load periods.
8. Identify proper cold boiler start-up procedures to prevent shock and possible damage to boilers.
9. Add labeling or tags to piping, valves and pumps for quick identification and maintenance. Labelling not complete until insulation is refitted. To be completed by utility operators.
10. Scheduling of annual boiler preventive maintenance and cleaning.
11. Develop list of boiler critical spare parts to order and stock. To be developed.

[Type text]

**Pilot Station Training Plan (RAVG)**

[Type text]

**#2 Priority Item: Water Treatment Plant Hydronic Heating System**

Working with operators, training shall address:

1. Repair of defective heat add system controls - sensors, aqua stat controllers and solenoid valves for the water storage tank and distribution loops 1 & 2.
2. Verify proper operation of the building unit heaters and controls.
3. Repair of all hydronic piping and fitting leaks throughout plant.
4. Verify concentration and condition of propylene glycol within hydronic system. Sample not taken. To be checked on follow-up trip.
5. Clean, repair or replace heat flow indicator / balancer and confirm proper operation.
6. Balance and set heat flows thru all heat exchangers and heating fixtures. basic balancing completed but additional hydronic flushing, cleaning and recharge with new fluid should be completed first.
7. Clean or replace of all non-functioning auto air relief valves. Spare auto air reliefs were provided
8. Add isolation valves under auto air reliefs to make cleaning and servicing during operation possible.
9. Verify expansion tank operation & proper pre-charge.
10. Purge air from heating system and provide procedures to maintain proper heat fluid pressure.
11. Venting heat circulation pumps and checking motor rotation.
12. Add check-valves to main heat pump manifold to prevent short circuit of flow. Install of additional valves were deleted due to head loss if valves were added. Operator was instructed to isolate non-operating pump.
13. Operators familiarize with basic heat transfer operation, control, trouble shooting and maintenance.
14. Set return loops to maintain 40 deg. F. return temp to minimize excessive heat loss and heating system fuel usage. Operator will monitor and slowly lower return loop temperature based on return temperature thermometer.
15. Basic understanding of hydronic heating system function and trouble-shooting.
16. Add labeling and directional flow arrows to hydronic piping and valves. Labelling was added, labels provided and a small labeler so operators can label additionally after insulation is complete.
17. Hydronic system maintenance
18. Develop list of critical spare parts to order and stock. To be developed with local utility operators. Cut sheet for all new equipment is provided.

[Type text]

**Pilot Station Training Plan (RAVG)**

[Type text]

**#3 Priority Item: Water Treatment Plant Fuel System**

Working with operators, training shall address:

1. Procedures to identify and remove presence of water from double wall bulk fuel storage tank. Water paste provided to operators
2. Second confinement fuel tank monitoring and draining. (Note: No proper plugs observed installed in low drain ports of secondary confinement) Provide plugs.
3. Replacement of equipment fuel filters. Main fuel filter to auto day-tank changed out. Individual equipment filters to be changed on follow-up trip.
4. Scheduling of annual fuel system preventive maintenance.
5. Develop list of fuel system critical spare filters and parts to order and stock. Spare filter stock provided. Water paste to be provided. List to be developed.

**#4 Priority Item: Sewer Lift Station**

Working with operators, training shall address:

1. Label and provide directional arrows to piping and valves.
2. Provide lock to exterior mounted double throw switch to protect from vandalism and public access to inside panel.
3. Replace screens on exterior hood openings.
4. Identify local emergency auxiliary pump and fittings for lift station. Pump was being used to discharge lagoon. Will investigate further during follow-up trip.
5. Identify local emergency electrical generator for lift station back-up power. This was not done
6. Schedule and procedures to monitor and minimize electrical heater use in lift station. Completely shut off during summer months.
7. Schedule and procedures to minimize or not use electrical heat tape on force main unless required for freeze recovery only.

**#5 Priority Item: Water Treatment Plant Building / Structure**

Working with operators, training shall address:

1. Replace broken exterior entrance lights with LED outdoor flood lights.
2. Remove, insulate and seal old cooling duct hood for old emergency generator location in water plant. (generator was moved to out building)
3. Remove, insulate and seal opening to broken north window in plant.
4. Chalk and seal all pipe penetrations, windows and exterior panel joints on building. Extra tubes chalking provided to add sealant during warmer summer temperatures.

[Type text]

**Pilot Station Training Plan (RAVG)**

[Type text]

**#6 Priority Item: Circulating Water Distribution Pump Loop 1&2**

Working with operators, training shall address:

1. Adding labels and directional arrows to distribution piping and equipment.
2. Monitoring and identifying minimal required circulating flows and pressure in the distribution loops 1 & 2. Loop #2 requires metered make-up water to be injected upstream of circulation pumps when pumps are in operation in winter to provide adequate pressure to high school tank filling.
3. Scheduled flushing and cleaning of loops 1 & 2 return line Y- strainer.
4. Cleaning flow balancer and indicators and identifying and setting proper balanced heat-add flow thru heat exchanger. Almost all the TB balancers and indicators were cleaned and rebuilt. Missing balancers were added per record planset and water side balancers were also added to control water flow. Proper flow of hydronic heat side fluid will need to be confirmed and checked. good heat transfer was observed.
5. Understanding difference of make-up water between loops 1 & 2. (Loop 1 make-up is after circulator pump and Loop 2 make-up before circulator pump on loop return. This creates different operational pressures when circulation pumps are operating)
6. Replacement of non-functioning safety flow switches on loops 1 & 2 return lines – setup and make operational with alarm system!
7. Replacement of all faulty non-functioning isolation valves in loop. Faulty valves gates were changed on valve bodies.
8. Circulation Pump #2 on Loop 2 is leaking water from seal. Replace seal assembly - make operational again. Spare seal kit was available from city critical repair parts.
9. Replacement of defective cold temperature alarm controls for distribution loops 1 & 2
10. Replace defective / corroded pressure gauges on supply and return lines of loops 1 & 2. Add 1/4" isolation valves to all pressure gauges.
11. Replacement of cracked 3"X 4" flanged rubber flex connectors on loops 1 & 2. Loops 2 flexes were replaced and strainer was rotated 45 deg. for easier cleaning access.
12. Circulating distribution system maintenance and flushing. To be done by community next early fall season with assistance from RMW and TUS
13. Develop list of critical spare parts to order and stock. To be developed with community.

**#7 Priority Item: Water Storage Tank and supply and return piping**

Working with operators, training shall address:

[Type text]

**Pilot Station Training Plan (RAVG)**

[Type text]

1. Labeling and directional arrows to piping and lines inside WTP for water tank supply and return and heat add system. Additional labels to be added by operators and during return follow-up trip.
2. Repair temperature controls for tank heat add to make operational and automatic controlling to maintain minimal operating temperature.
3. Repair / replace defective cold temperature alarm controls and flow switch for water storage tank and tank loop piping heat-add system.
4. Determining solution for repair of the existing non-functioning electrical recovery heat trace on supply and return piping from building to water storage tank. Solution for heat trace repair will require further effort and funding.
5. Schedule inspection of interior WST for corrosion and tank metal condition. Note: This is not directly part of the RAVG funding relating to the energy audit but a direct concern and requirement for the operation of entire system. Yet to be scheduled and determined.
6. Reseal and insulate holes in insulated man-way hatch cover, tank skin and tank's arctic valve box. To be completed by utility operators.
7. Identify and provide a replacement tank level gauge. Yet to be determined of a specified replacement
8. Develop list of critical spare parts to order and stock. To be developed with the operators

**#8 Priority Item: Emergency Backup Generator and Building**

Working with operators, training shall address:

1. Rehabilitation of the existing heat system feeding building to make operational and controlled. Work to include:
  - a) Replacement of existing 1" HDPE heat loop lines to 1" PEX heat tubing with O2 barrier.
  - b) Install heat controls for heat loop.
  - c) Install expansion tank for heat loop
  - d) Install additional auto air venting on WTP side of loop.
  - e) Confirm operation of building unit heater and temperature control switch for fan.
  - f) Repair all leaks on heat loop.
2. Provide lock for building's exterior electrical disconnect switch. To be provided by utility operators
3. Install exterior entrance lighting with LED outdoor flood light.
4. Provide battery for generator.
5. Provide battery maintainer / trickle charger. Repaired existing charger / maintainer
6. Identify generator start-up and operational procedures.

[Type text]

**Pilot Station Training Plan (RAVG)**

[Type text]

- 5. Start-up and functionally test generator. Note: Generator operating with over voltage and possible high frequency cycling. Return follow-up trip required after research to make adjustments and re-test generator.
- 8. Identify required generator preventive maintenance. To be developed with the operators. Need to locate manufacturer's generator operation manual.
- 9. Replace generator oil, filters and check belts. Spare
- 10. Establish scheduled monthly operation and test schedule. To be developed with the operators
- 11. Develop list of critical spare parts and filters to order and stock for emergency generator system. To be developed with the operators

**#9 Priority Item: Water Treatment**

Working with operators, training shall address:

1. Labeling and directional arrows to filter piping and valves. Operators to add when finished with reinsulation.
2. Repair #1 Filter piping to make operational again.
3. Repair leaks in filter piping.
4. Replace corroded or non-existent filter differential gauges Operator to finish out gauge replacement.
5. Replace all faulty flow switches and incorrect installation tee adapters to make chemical pump control circuit operate automatically from well water / treatment flow. Currently chemical pumps are operated and controlled manually by operator.
6. Replace corroded pressure relief valves on well lines. (to prevent possible overpressure and damage to well supply lines in event of closed treatment valve)
7. Identify materials and components needed to add a chlorine mix / settling tank to minimize operator's chlorine gas exposure and corrosion throughout the WTP. To be developed, list to be provided to community for purchase and installed by operators with technical assistance from TUS.
8. Test raw water for current levels of iron and manganese. Will provide ordering specification and information to community for purchase. Technical assistance provided by TUS for training and use.
9. Evaluate filter media and existing water treatment process. Filter #1& #2 media needs extensive backwash to clean and clear. Operators to backwash both filters until clean and start filtering using both media filters operating in parallel. Chlorine injection to be upstream of filters to enhance oxidation and removal of iron.
10. Consider relocating chlorine injection point upstream of water treatment to enhance oxidation of the iron present in Well "A" water so filters can better remove iron during treatment and provide better water quality.

[Type text]

**Pilot Station Training Plan (RAVG)**

[Type text]

11. Develop list of critical spare parts to order and stock for water treatment. To be developed with operators

**#10 Priority Item: Wells / Water Source****Well "A" Primary Main Water Source**

Working with operators, training shall address:

12. Test & clarify electrical heat trace use & operation to minimize electrical consumption. Use only thaw recovery
13. Repair well site fencing. (Water Source protection) To be done by operators
14. Lock well site disconnect switchbox – protect public from electrical contacts access. To be done by operators
15. Repair treated plywood weather protection cover for well site load center & disconnect switch. To be done by operators
16. Provide cover for buried valve boxes. To be done by operators
17. Verify replacement spare well pump on hand. To be determined with the operators

**Well "B" Alternate Water Source**

Working with operators, training shall address:

1. Test & clarify electrical heat trace use & operation. Note: Well "B" only used as back up in event well "A" is not producing. Was not tested – plan testing on future follow-up trip

**Well "C" Alternate Water Source**

Working with operators, training shall address:

2. Test & clarify electrical heat trace use & operation. Note: Well "C" only used as back up in event well "A" is not producing. Was not tested – plan testing on future follow-up trip

**REGIONAL TRAINING****Avtec Training**

Community utility operators were invited to participate in AVTEC - May 12<sup>th</sup> through May 23<sup>rd</sup> 2014 emphasizing ADEC certification to the provisional water treatment and water distribution which also includes hands on skills training for oil fired boiler operation maintenance, HDPE pipe fusion, copper pipe fitting and soldering, basic electrical controls and water plant filter

[Type text]

**Pilot Station Training Plan (RAVG)**

[Type text]

treatment process. Participation in training was declined. Primary operator already holds certification and the alternate operator had other conflicting preset schedules. We will encourage operators to participate in the second AVTEC training scheduled August 4<sup>th</sup> through August 15<sup>th</sup> 2014. Operators declined and did not participate in 2014 AVTEC training stating the training was too lengthy and conflicted with prior engagements.

**Attachment 4**

**ANTHC Rural Energy Initiative Four Year Plan  
2016-2019**

## ANTHC Rural Energy Initiative

### Four Year Plan 2016-2019

#### **Addressing the High Cost of Water and Sewer Service in Rural Alaska**

Providing the vital health benefits of clean water and sanitary sewer systems for remote communities with no road access in extremely cold climates makes for unique challenges, including extremely high energy usage and high energy costs. Energy costs make up, on average, 40% of the total cost of providing public sanitation in rural Alaska, with electricity costs as high as \$1.00/kilowatt-hour, and heating fuel costs over \$10 per gallon in some locations. Water and sewer bills in rural Alaska range from \$80 to \$250 per month, and average 3-8% of median household income; this confluence of factors is a direct threat to the sustainability of public sanitation across rural Alaska.

ANTHC's Rural Energy Initiative works specifically to reduce the cost of energy for operations of water and wastewater services in rural Alaska communities. The Rural Energy Initiative carries out this mission through a four-phased approach:

- I. Identify Energy Use and Potential Projects
- II. Implement Energy Efficiency Retrofits and Provide Operator Training
- III. Develop Renewable Energy Projects
- IV. Monitor Results and Effectiveness

#### **I. Identify Energy Use and Potential Energy Projects**

ANTHC has conducted energy audits for 46 community sanitation systems across rural Alaska since 2011. This effort has identified \$4.6 million in potential energy efficiency retrofits, with an expected energy savings of over \$1 million annually. These audits have been funded by DOE, USDA-RD, the State of Alaska, and the Denali Commission.

ANTHC is funded to conduct audits of 39 more rural sanitation systems by October 2016. This effort is expected to identify \$4 million in potential retrofit projects, with an expected energy savings to rural communities of \$750,000 annually.

Once all currently funded energy audits are completed, ANTHC has identified 74 additional rural communities with sanitation systems in need of an energy audit. This would cost an estimated \$850,000 to carry out over a four-year period from 2016 to 2019.

In addition to energy audits, ANTHC has funded engineering feasibility studies for 39 community sanitation systems to identify and develop specific renewable energy solutions to reduce dependence on fossil fuels and lower operating costs. This service has been provided at an average cost of \$10,000 per study. \$480,000 is required to continue assisting rural communities in identifying renewable solutions through the next four years.

## **II. Implement Energy Efficiency Retrofits and Provide Operator Training**

Using the results of the energy audits conducted, ANTHC has found \$3.5 million in funding to implement energy efficiency improvements and provide training for rural sanitation system operators in the previously audited communities. The training of operators is critical to maintaining energy efficiency benefits, since human behavior is central to long-term efficiency. Funding has been identified to provide two weeks of formal energy and water treatment training to operators from these previously audited communities, in partnership with the Alaska Vocational Technical Center (AVTEC).

To continue the implementation of energy efficiency improvements and operator training for all the communities with completed audits will require an additional \$1 million. The expected annual energy savings from this effort are estimated at \$1 million annually.

Implementation of energy efficiency projects and provision of operator training for the remaining 113 unaudited rural sanitation systems in Alaska is estimated to cost \$11.3 million, and yield over \$1.6 million in annual energy savings for rural sanitation systems. This effort could be carried out over six years. 80 of these communities could be served over a four-year period beginning in 2016 with \$8 million in funding, resulting in an estimated \$1.2 million in annual energy savings.

## **III. Implement Renewable Energy Solutions**

Since 2009, ANTHC has worked on behalf of Alaska's rural communities to identify, design and construct renewable energy solutions to reduce the high cost of operating sanitation systems. The implementation of renewable energy has steadily increased each year as new opportunities are identified and innovative approaches are developed. Integration of renewable energy as part of the solution to high operating costs serves to not only reduce system dependence on high-cost fossil fuels, but also leads to more affordable and sustainable residential water and sewer service. Alternative energy solutions used by ANTHC include: heating water systems with recovered heat from community power plants, biomass heating using local wood resources, ground source heat pumps, hydro-electricity, and use of excess wind energy to heat sanitation systems.

ANTHC has completed 12 renewable energy projects for rural Alaska sanitation systems since 2011. Funding for these projects in the amount of \$8.2 million has been provided by DOE and the State of Alaska's Renewable Energy Fund. This initial deployment of renewable energy systems has resulted in a total annual savings of \$1.03 million in 2014.

To continue the beneficial results of renewable energy solutions in other rural communities, ANTHC has completed feasibility analyses for renewable projects in 27 additional communities. These projects are projected to reduce sanitation system heating fuel needs by 343,000 gallons per year, with an estimated annual energy savings of \$1,920,000 across all communities. Partial funding of \$9.8 million is currently being employed to design and construct renewable energy projects, however, \$10.5 million in additional funding is required over the next four years to complete all identified renewable energy systems.

**IV. Monitor Results and Track Effectiveness**

Monitoring the results of energy upgrades and ensuring that energy savings are realized and maintained is an important part of the Rural Energy Initiative.

ANTHC is installing simple, off-the-shelf equipment to remotely monitor sanitation systems and maintain information on energy use via a web-based interface. To date, this program has provided monitoring service to 17 communities, with 28 communities expected to be served by the end of 2016. In addition to tracking energy performance, remote monitoring enables maintenance expertise outside the community to identify potential catastrophic failures such as freeze-ups and avert expensive and damaging emergencies.

To provide remote monitoring equipment to the remaining 135 rural sanitation systems will require \$2.7 million in funding and could be carried out over six years. During the next four years, 80 systems can have remote monitoring equipment installed at a cost of \$1.6 million.

**Total Funding Needed to Carry out Work over Next Four Years: \$22.43 million**

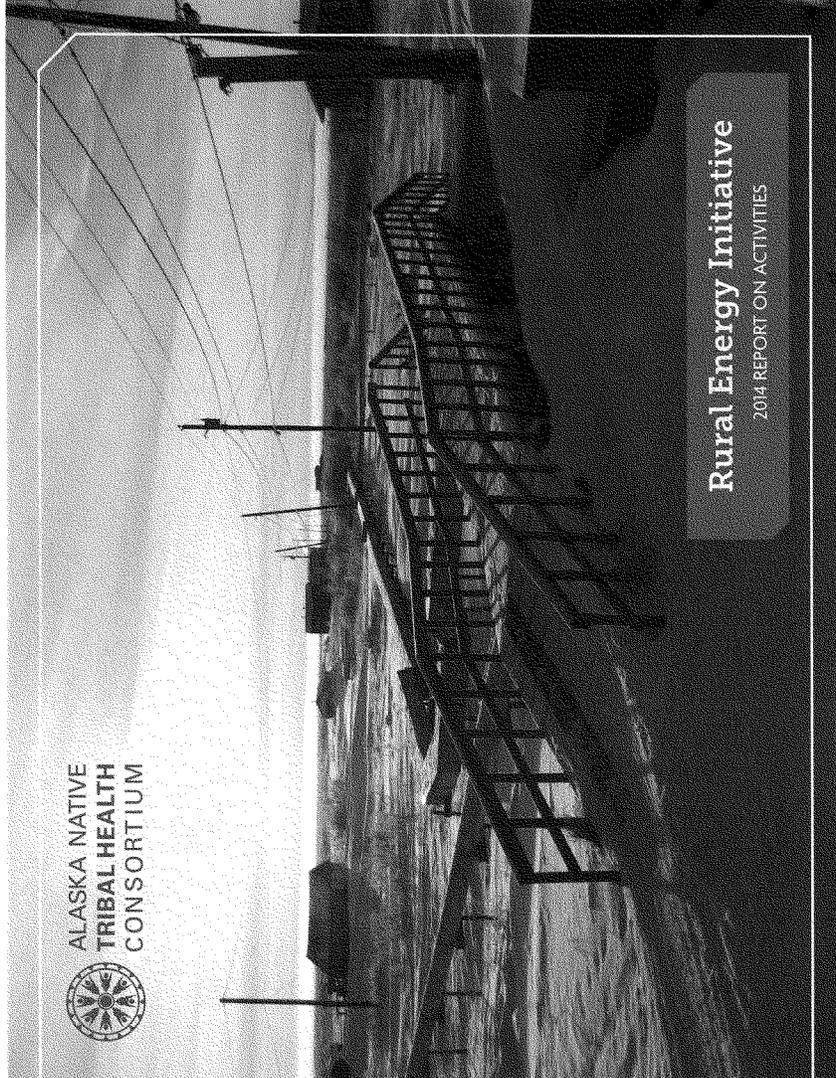
**Total Potential Annual Energy Savings From This Work: \$3.37 million**

**Number of Potential Communities Impacted: 158**



Four Year Plan  
Annual Energy Savings for Sanitation Systems  
\$3,370,000

**Attachment 5**  
**ANTHC Rural Energy Initiative**  
**2014 Report on Activities**



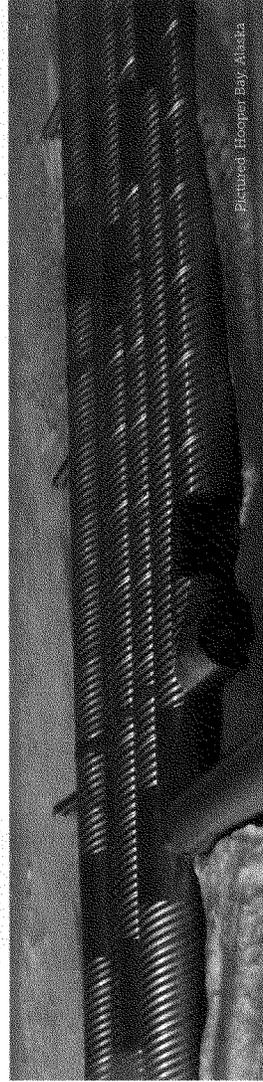


We believe our basic sanitation should be efficient,  
sustainable, and affordable.



**Contents**

Message from the Program Administrator.....	1	Case Study: Kohuk Biomass.....	12
What is the Rural Energy Initiative?.....	2	Renewable Energy: Heat Recovery.....	13
Our Finances.....	3	Case Study: Savoonga Heat Recovery.....	14
Fiscal Year 2014 Organization Chart.....	4	Renewable Energy: Wind to Heat.....	15
What Does Energy Have to do With Water and Sewer?.....	5	Case Study: Mekoryuk Wind to Heat.....	16
What We Do.....	6	Renewable Energy: Hydroelectric.....	17
Energy Efficiency.....	7	Case Study: Ouzinkie Dam.....	18
Case Study: Pilot Station Energy Improvements.....	8	Our Efforts to Date by Community.....	19
Remote Monitoring.....	9	How Are We Moving Forward?.....	25
Renewable Energy: Biomass.....	11	Our Partners.....	26



Pictured: Hooper Bay, Alaska

## Message from the Program Administrator



In 2014, the Alaska Native Tribal Health Consortium's (ANTHC) Rural Energy Initiative completed several renewable energy projects. Projects include recovered heat projects in Ambler and Savoonga, a biomass system in Kobuk and our first wind to heat project in Mekovik in October. Along with renewable energy projects, the Rural Energy Initiative received funding from the USDA Rural Development, Denali Commission and the State of Alaska Department of Environmental Conservation to perform additional energy audits, implement energy efficiency upgrades in 39 communities and provide operator training. To accomplish these projects, the Rural Energy Initiative collaborated with regional housing authorities and state and federal agencies, along with other stakeholders in order to confront Alaska's rural energy challenges.

A significant challenge is the continued high cost of fuel oil energy in rural Alaska, despite the drop in crude oil prices that lowers utility costs for residents of the Lower 48. Rural Alaska buys fuel in bulk during the summer to last through the year. At the time that many communities purchased fuel, the price was still high. Because of reduced oil revenue, the State of Alaska has proposed to cut revenue sharing, a funding source that many rural communities rely on to operate and maintain their sanitation systems. This potential loss, mixed with high energy costs, will challenge rural Alaska's financial sustainability. Now more than ever, it is important to reduce the high cost of operating sanitation systems in rural Alaska.

With limited funding availability at both the State and Federal levels, our program has created alternative ways to continue serving our customer owners. This next year will see more collaborative efforts with ANTHC's Alaska Rural Utility Collaborative, the Alaska Energy Authority, Tribal organizations, rural power companies and several others to reduce energy costs and improve overall sustainability throughout Alaska. The Rural Energy Initiative will continue to help communities identify renewable energy projects that reduce costs, while increasing energy efficiency and operator training and maintenance. Reductions in energy costs for sanitation systems will expand access to clean water and improve public health, reduce household expenses, improve community economies, and result in savings to the State of Alaska's operating budget.

Though the next year may be more competitive for project funding, our newly formed partnerships will help us effectively carry on our work to improve the overall vitality of the rural Alaskan communities we serve. We look forward to working with you in the challenges ahead.

Gunaichessin.

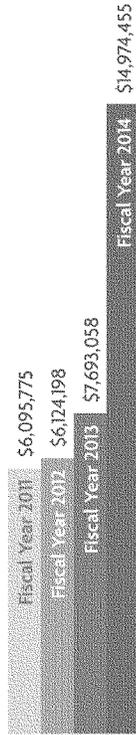


Suzanne Wolf  
Rural Energy Initiative Program Administrator

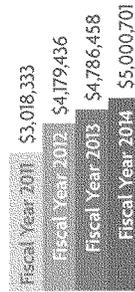


## Our Finances

Total grant funds applied for on behalf of communities by fiscal year



Total project funds awarded by fiscal year



Our Impact



**\$1,496,430**  
Estimated annual savings of projects implemented in fiscal year 2014

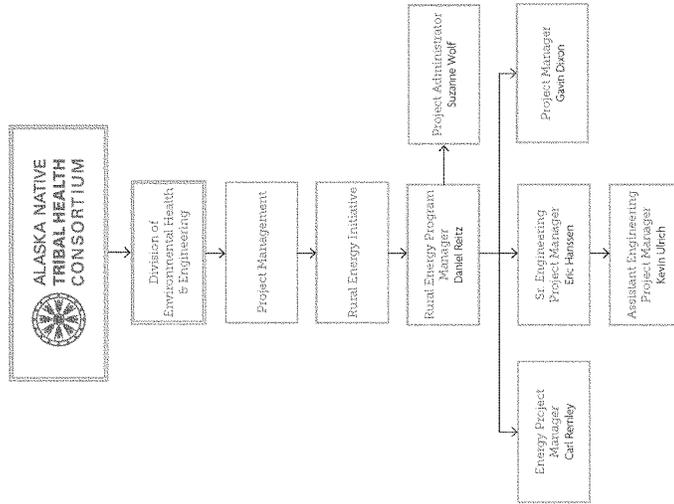


**\$3,783,566**  
Estimated cumulative annual savings of projects completed from start of program through fiscal year 2014



**\$6,698,977**  
Estimated projected savings of projects from start of program through fiscal year 2015

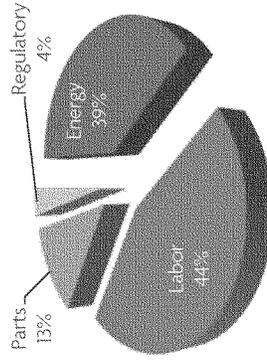
### Fiscal Year 2014 Organization Chart



## What Does Energy Have to Do With Water and Sewer?



Providing clean water and sanitary sewer systems for remote communities with no road access in extremely cold climates presents unique challenges, including extremely high energy usage and high energy costs. On average, energy costs are 39 percent of the total cost of providing public sanitation in rural Alaska, with electricity costs as high as \$1000/kilowatt hour, and heating fuel costs over \$10.00 per gallon in some locations. Water and sewer bills in rural Alaska range from \$80 to \$250 per month, and average 3-8 percent of median household income. This confluence of factors is a direct threat to the sustainability of public sanitation across rural Alaska.



Breakdown of the operating cost for an average water/sewer system in rural Alaska

## What We Do



### Energy Audits

Energy audits identify measures that can greatly reduce energy costs. ANTHC adapts industry accepted energy audit practices to fit the unique needs of Arctic water systems.

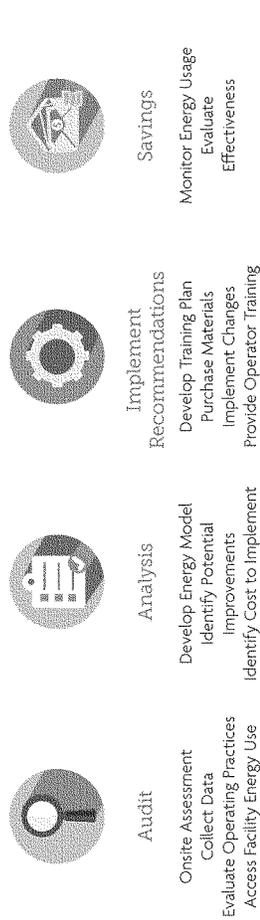
### Energy Efficiency Retrofits

Reducing energy use is much cheaper than increasing energy supply, so ANTHC identifies ways to make existing home and utility systems operate more efficiently. ANTHC has conducted energy audits for 46 community sanitation systems across Rural Alaska since 2011. These audits have been funded by DOE, USDA Rural Development, the State of Alaska, and the Denali Commission.

### Renewable Energy Projects

Renewable energy projects such as biomass, wind to heat, heat recovery, hydroelectric, and solar can offer high impact energy solutions for rural Alaska. ANTHC assists communities in identifying renewable energy projects that work for each community, seeks funding to implement the project and provides project management and construction of the system. ANTHC has completed 12 renewable energy projects for rural Alaska sanitation systems since 2011. This initial effort has resulted in a total annual cost savings of \$1,030,000 in 2014. Funding for these projects has been provided by DOE and the State of Alaska's Renewable Energy Fund.

## Energy Efficiency



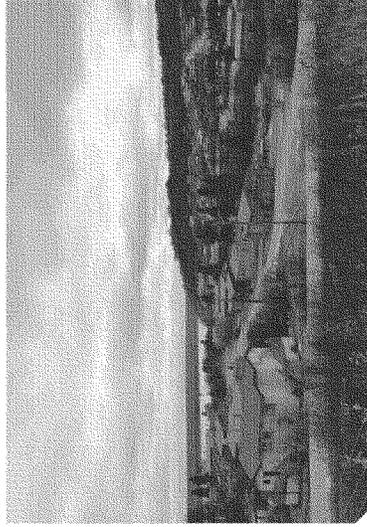
ANTHC's Rural Energy Initiative received a grant from the Denali Commission to implement energy efficiency measures in up to 45 rural Alaska sanitation systems. The grant also funds energy audits for sanitation systems in up to 39 additional rural Alaska communities.

The grant provides funding for maintenance and operations training, installation of more efficient retrofitted equipment, and increases the useful life of the aging sanitation infrastructure in rural Alaska. Implementing appropriate new technologies, such as LED lighting, high efficiency pumps, and new controls infrastructure, helps realize significant energy savings. ANTHC is further able to provide personalized operator training, so that operators can run their sanitation facilities more efficiently and maintain energy savings for communities for years to come.

The goal of reducing energy costs in rural sanitation systems is to improve the long-term sustainability of facilities and reduce the cost of water and sewer service for homeowners.

This grant, in conjunction with energy efficiency focused funding from USDA Rural Development, State of Alaska Department of Environmental Conservation and the Alaska Legislature, is expected to produce **\$643,200 in annual energy savings in rural sanitation systems** once all work is complete.

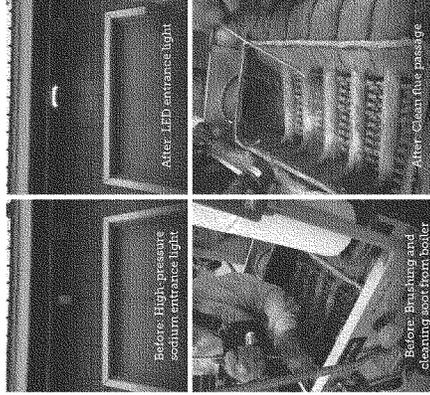
## Case Study: Pilot Station



In 2014, ANTHIC completed energy efficiency work on the local water and sewer system in Pilot Station. Since these retrofits were implemented, **the community has seen a 66 percent reduction in fuel use and a 33 percent drop in kWh consumption** compared to the initial energy audit in 2012.

This project is expected to save the community more than 1,000 gallons of fuel oil and 25,000 kWh annually for a **combined annual savings of \$11,090** including an \$8,750 annual savings to the Power Cost Equalization (PCE) program.

Upgrades included cleaning of the boilers, upgrading hydronic controls, replacing lights with LEDs, rerouting plumbing, and minor building weatherization. Training was provided to the local operator, which included boiler run times, setting and maintaining proper operational parameters and preventative maintenance schedules.



## Remote Monitoring

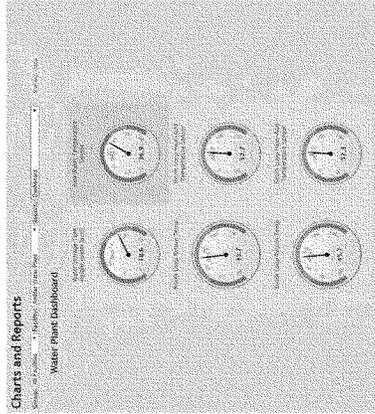
Monitoring energy investments to ensure that ongoing energy savings are realized and maintained is an important part of the Rural Energy Initiative.

ANTHC installs simple monitoring equipment to remotely monitor sanitation systems performance and maintain information on energy use. To date, this program provides monitoring service to 17 communities, with 28 communities expected to be served by the end of 2016. In addition to tracking energy performance, remote monitoring enables utility operators to access maintenance expertise outside the community to identify potential catastrophic failures such as freeze-ups and avoid expensive and damaging emergencies.

### What it is and how it can help

Small wireless devices are installed in key locations in the water plant (and other facilities) which supplies information to an internet-based data bank on a regular recurring schedule. Information such as water temperature, plant temperature, water flow rates and tank levels are typically reported. The data assists state, federal and Tribal Health Organization responders to identify threats to the systems that may not be detected locally. The data will also create a record of long-term operational performance that can help operators, engineers and others identify trends and make recommendations to save energy, supplies, labor and money.

All remote monitoring equipment is labeled and does not change the existing operation of the water plant. This system simply allows for improved outside technical support when necessary. If desired, the water operators, financial administrators or other community members are welcome to also monitor the information captured by visiting the Remote Monitoring Dashboard available online.



Remote Monitoring serves two critical functions:

1. Direct monitoring of a facility to prevent catastrophic failure
2. Data collection for future energy audits/retrofits.

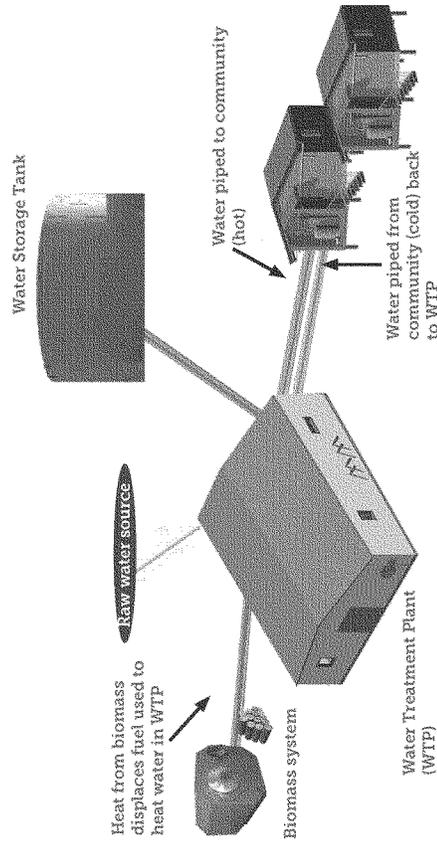
The Remote Monitoring Dashboard can be accessed by visiting:  
[www.rm.anthc.webfactional.com](http://www.rm.anthc.webfactional.com).



## Renewable Energy: Biomass

Biomass projects use wood fired boiler systems that displace fuel oil for heating public facilities. Using locally harvested wood in the heating system, instead of fuel oil, keeps energy dollars in the local economy and reduces the dependence on fuel oil for heating. These benefits promote energy sustainability and provide the added benefit of creating new jobs for local wood cutters in rural communities, where employment is hard to come by.

The Rural Energy Initiative is at the forefront of biomass projects for rural communities. During 2014, four new projects were designed and began construction in the communities of Kobuk, Anvik, Hughes, and Koyukuk. Combined, **these projects are expected to reduce annual heating oil consumption by 21,000 gallons and save an estimated \$121,000 in annual energy costs.** The Rural Energy Initiative is also working with the communities of Huslia and Ambler to develop and seek funding for future public facility biomass heating systems.



## Case Study: Kobuk Biomass



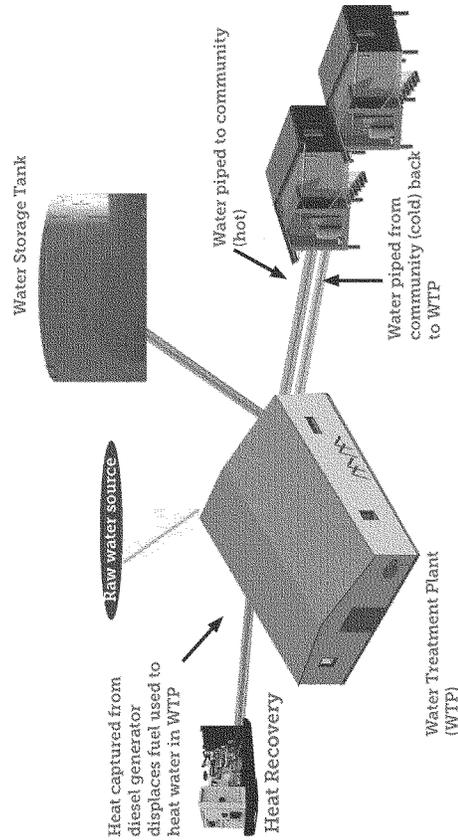
In 2013, Kobuk received funding through the State's Alaska Energy Authority to design and construct a biomass boiler to heat the community's water system. Thanks to the combined efforts of ANTHC's Rural Energy Initiative team, ANTHC's Alaska Rural Utility Collaborative, NANA Regional Corporation, the City of Kobuk and the Kobuk Traditional Council, it is anticipated that the Kobuk biomass project will help the community's water treatment plant save \$24,000 annually.

Of the overall \$24,000 annual savings, \$10,500 goes to local wood cutters for supplying cordwood and \$13,500 will be the direct savings to the operation of the Kobuk Water Plant.

## Renewable Energy: Heat Recovery

Up to 70 percent of the energy from diesel generators is lost as heat that is a normal part of the generator's cooling processes. This means that only 30 percent of the diesel used goes towards creating electricity. To make use of this "wasted" energy, ANIHC has partnered with the Alaska Village Electric Cooperative and other local power companies to recover heat from community power plant cooling systems and redistribute it for heating water.

In a heat recovery system, excess heat energy is captured from the local electric plant and transferred to heat the water plant instead of burning heating fuel, which results in substantial cost savings for both utilities. The heat in the electric plant is created as a byproduct of diesel powered electricity generators. Since the installation of these heat recovery systems in communities, there are tremendous results in energy savings from reducing fuel oil consumption. Examples of such savings can be seen in a case study of the system in Savoonga on the following page.

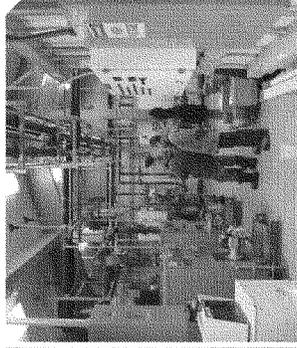
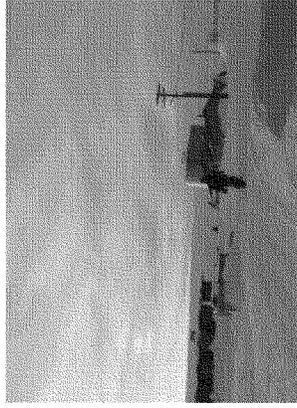
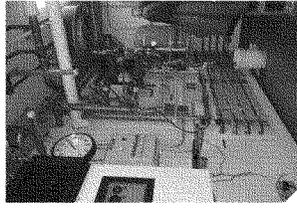


## Case Study: Savoonga Heat Recovery

As fuel prices and energy costs have climbed across Alaska, ANTHC's heat recovery projects and partner support are helping rural communities and their residents save money and maximize resources. In collaboration with the Alaska Energy Authority, Alaska Village Electric Cooperative, and ANTHC's Alaska Rural Utility Collaborative program, a heat recovery project was completed in Savoonga in October 2014. This project took previously unused energy from the power plant and redistributed it to the water treatment plant.

From the time the system was installed to March 2015, it **reduced fuel usage by 90 percent, displacing 1,686 gallons of heating oil or about \$7,166 in energy savings.**

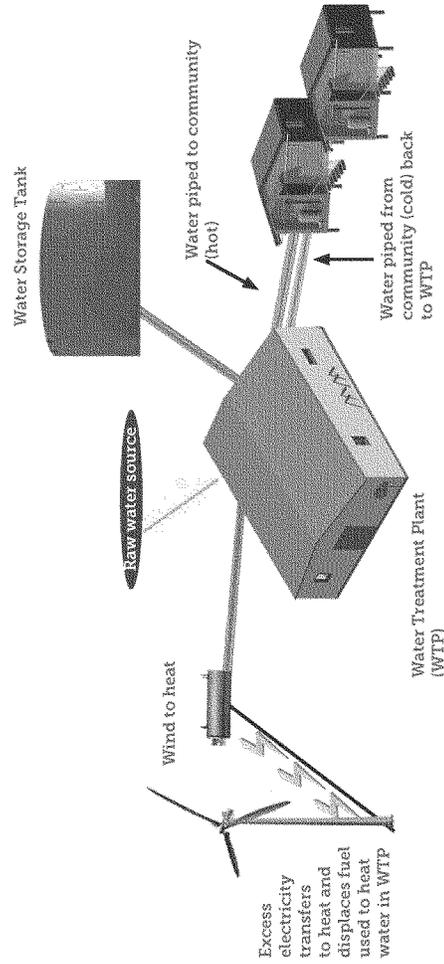
With the system now fully operational, it is expected that the community will reduce their heating fuel usage by 8,800 gallons of fuel, for a savings of almost \$40,000 per year.



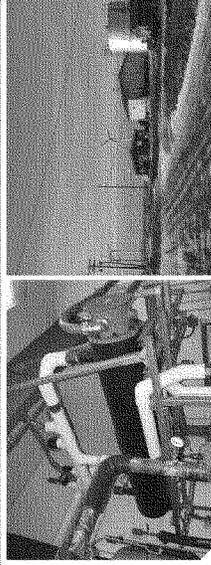
## Renewable Energy: Wind to Heat

"Wind to Heat" systems use the extra electricity generated from wind turbines during peak wind events to heat water for use in Arctic sanitation systems.

Development of the "wind to heat" system was conceived by ANTHC's Rural Energy Initiative in 2011. This innovation, the first in Alaska and perhaps in the country for public water systems, was developed by ANTHC in partnership with the Alaska Village Electric Cooperative, an electric company that owns and operates rural electrical utilities utilizing a mix of diesel and wind power. AVCC has agreed to sell extra power generated by wind turbines under interruptible power agreements at substantial discounts to the community sanitation utilities. Wind energy is transferred through use of electric boilers in the water treatment plant and displaces fuel used to heat the water.



## Case Study: Mekoryuk Wind to Heat

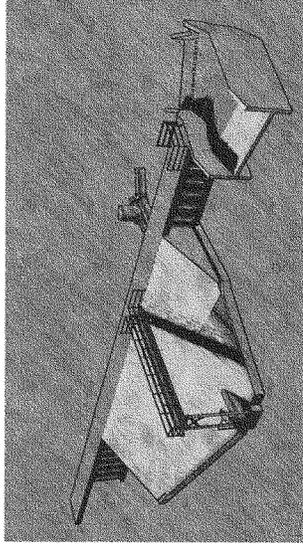


Potential fuel savings of \$40,000 annually

Cost of \$0.05 per kWh is equivalent to fuel oil at \$1.46 per gallon.

Since October 23, 2004, the wind to heat system in Mekoryuk has transferred 9,252 kilowatt-hours. By estimation, these savings are only the beginning of decades of continual savings to public sanitation systems in these underserved, remote communities.

## Renewable Energy: Hydroelectric



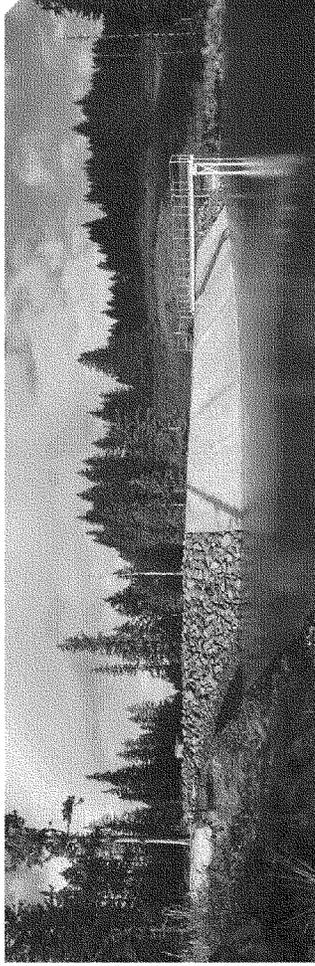
Water systems often share infrastructure with hydroelectric facilities. Often, a dam and penstock are shared between the hydroelectric producer and the water system owner. The dam backs up water needed for a year round drinking water as well as providing water for steady hydroelectric operations. The penstock, or pipeline, is needed to transport water to both the generator and water plants.

**Combining public water and power facilities reduces capital costs associated for both sanitation and power infrastructure, with compounded benefits for the community.**

Where hydroelectric facilities are possible, ANTHC has helped communities identify that potential and assemble technical analysis to assist with grant funding. ANTHC submitted a grant application for design funding from the State of Alaska Energy Authority's Renewable Energy Fund for the communities of Scammon Bay and Ozunkle, which has been recommended to the state legislature for funding.

**In Scammon Bay, ANTHC has identified the potential electrical generation of 755,790 kWh through hydroelectric, a diesel offset of 39,252 gallons of fuel or \$157,007 a year.**

## Case Study: Ouzinkie Dam



The Ouzinkie Dam project was completed in 2014. The \$2.3 million project replaced a deteriorating wooden dam constructed in 1986 with a new, state-of-the-art concrete faced rock-fill facility built to withstand magnitude 8.8 earthquakes and major floods, while efficiently providing clean water and affordable hydroelectric power to residents.

Construction on this project allowed the community to continue producing 30 percent of its electricity from hydroelectric power, or 300,000 kWh/year, with a diesel offset of 24,584 gallons of diesel or \$148,240 per year.

ANTHC completed and submitted a feasibility study to Alaska Energy Authority's Renewable Energy Fund Round 8 to upgrade the city-owned hydro turbine that would further enhance this project.

The application identified an additional potential electrical generation of 100,000 kWh through an improved turbine and penstocks for an additional annual savings of \$46,382.

## Energy Efficiency Projects to Date by Community

Community	Energy Audits	Sanitation Energy Efficiency	Health Clinic Energy Efficiency	Remote Monitoring
Ahtachak	Funded			
Akiak	Completed	Funded		
Alaknuk	Completed	Active		
Alatna	Funded	Funded		
Aliakaket	Active	Funded		
Ambler	Completed	Active		Completed
Brevig Mission	Completed			
Buckland	Funded			Funded
Cheforiak	Completed	funded		
Chevak	Completed	Completed		Active
Chuathbaluk	Completed	Funded	Completed	
Deering	Active			Active
Eek	Completed	Funded		
Ekrook	Funded			
Elim	Completed	Active		Completed
Emmonak	Completed	Active		
Fort Yukon	Funded			
Galena	Funded			
Gambell	Completed	Active		Funded
Golovin	funded			

Energy Efficiency Projects to Date by Community (continued)

Community	Energy Audits	Sanitation Energy Efficiency	Health Clinic Energy Efficiency	Remote Monitoring
Goodnews Bay	Completed			
Grayling	Completed	Active		
Gulkana	Funded			
Holy Cross	Completed	Active		
Hooper Bay	Funded			
Huslia	Completed	Completed		
Igouagig	Shipped			
Kallag	Active	Funded		
Kasigvak	Funded			
Kiana	Funded			
Kipruk	Completed		Completed	Active
Kivalina				Completed
Kobuk	Completed	Active		
Koligarnek	Funded			
Korgujinak	Completed	Active		
Kotlik	Funded			
Koyuk	Completed	Active		Shipped
Koyukuk	Completed	Active		
Lower Kuskokwim	Completed	Funded	Completed	
Manokotak	Funded			

Energy Efficiency Projects to Date by Community

Community	Energy Audits	Sanitation Energy Efficiency	Health Clinic Energy Efficiency	Remote Monitoring
Marshall	Completed	Funded	Completed	
McGrath	Funded			
Minto	Funded	Funded		
Mountain Village	Funded			
Napaskiak	Completed	Funded	Completed	
Nerrana	Completed		Completed	
New Stuyahok	Funded			
Newtok	Completed	Funded	Completed	
Nightmute	Completed	Funded		
Nikolai	Funded			
Nearak	Funded			Completed
Nordalton	Completed	Active		
Nooryik	Funded			
Nulato	Completed	Completed	Completed	
Nunam Iqaa	Completed	Active		
Nunapitchuk	Completed	Funded		
Oscarville	Completed			
Pilot Station	Completed	Active	Completed	
Pikas Point	Completed	funded		
Platinum	funded			
Quinhagak	Funded			
Rampart	Funded			
Russian Mission	Completed	Funded	Completed	

Energy Efficiency Projects to Date by Community (continued)

Community	Energy Audits	Sanitation Energy Efficiency	Health Clinic Energy Efficiency	Remote Monitoring
Saint Mary's	Completed			
Savoonga	Completed	Funded	Completed	Funded
Seamanon Bay	Completed			
Selawik	Completed	Completed		Completed
Shaktolik	Completed	Active	Completed	Funded
Shishmaref	Active	Funded		
Shungnak	Funded			Completed
Sleetmute	Completed		Completed	
St. Michael	Completed	Active		
Stebbins	Funded			Funded
Tanacross	Funded			
Tarana	Funded			
Teller	Completed	Funded	Completed	
Togiak	Funded			
Toksook Bay	Completed	Funded		
Tuluksak	Completed			
Tuntutuliak	Completed	Funded	Completed	
Tununak	Completed	Funded		
Twan Hills	Completed			
Unalakleet	Funded			
White Mountain	Funded			

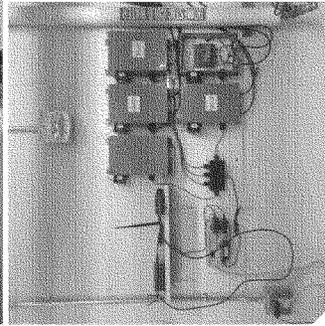
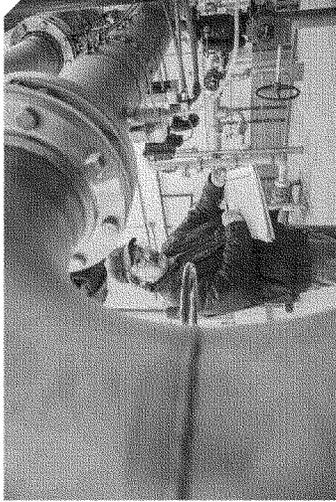
## Renewable Energy Projects to Date by Community

Community	Heat Recovery	Biomass	Wind to Heat	Feasibility Study
Allakaket	Completed			
Ambler	Completed			Completed
Aniak		Active		Completed
Atnautluak	Active			
Beving Mission	Active			Completed
Chevak	Funded			Completed
Chuathbaluk				Completed
Ek				Completed
Elum		Completed		
Emmonak	Funded			Completed
Gambell			Active	
Goodnews Bay	Completed			Completed
Grayling			Active	Completed
Holy Cross				Completed
Hughes		Active		
Huslia				Completed
Kobuk		Completed		
Koyuk				Completed
Koyukak		Active		Completed
Kwiglingok	Completed			
Lower Katsikag				Completed
Marshall	Active			Completed
Matlakota				Completed

### Renewable Energy Projects to Date by Community (continued)

Community	Heat Recovery	Biomass	Wind to Heat	Feasibility Study
McGrath	Completed			
Mekoryuk			Completed	
Minto	Completed			Completed
Noatak	Completed			Completed
Noorvik	Active			
Nulato				Completed
Ouzirike				Completed
Quinhagak	Active			Completed
Russian Mission	Active			Completed
Saint Mary's	Funded			Completed
Saint Michael				Active
Savoonga	Completed			Completed
Selawik	Completed			Completed
Shaktolik	Active		Active	Completed
Shashimarf				Completed
Shungnak	Completed			Completed
Sisemute	Completed			Completed
Stebbins	Active			Completed
Togiak	Active			Completed
Tuntutuliak	Active			Completed
Yenatie				Completed
White Mountain	Completed			

## How are we moving forward?



**Expand ANTHC's Energy Efficiency Program:** Seeking funding to expand audits, energy retrofits and training.

**Audits and retrofits** in more than 40 additional communities to be completed over the next two years.

**Work with villages and regional partners** to apply for grants and loans to implement long term recommendations – including renewable energy.

**Monitor results** to capture data and develop "Best Practices."

**Coordinate with the Alaska Remote Maintenance Worker (RMW) Program and local government specialists** as upgrades are made to enhance long-term regional-level support.

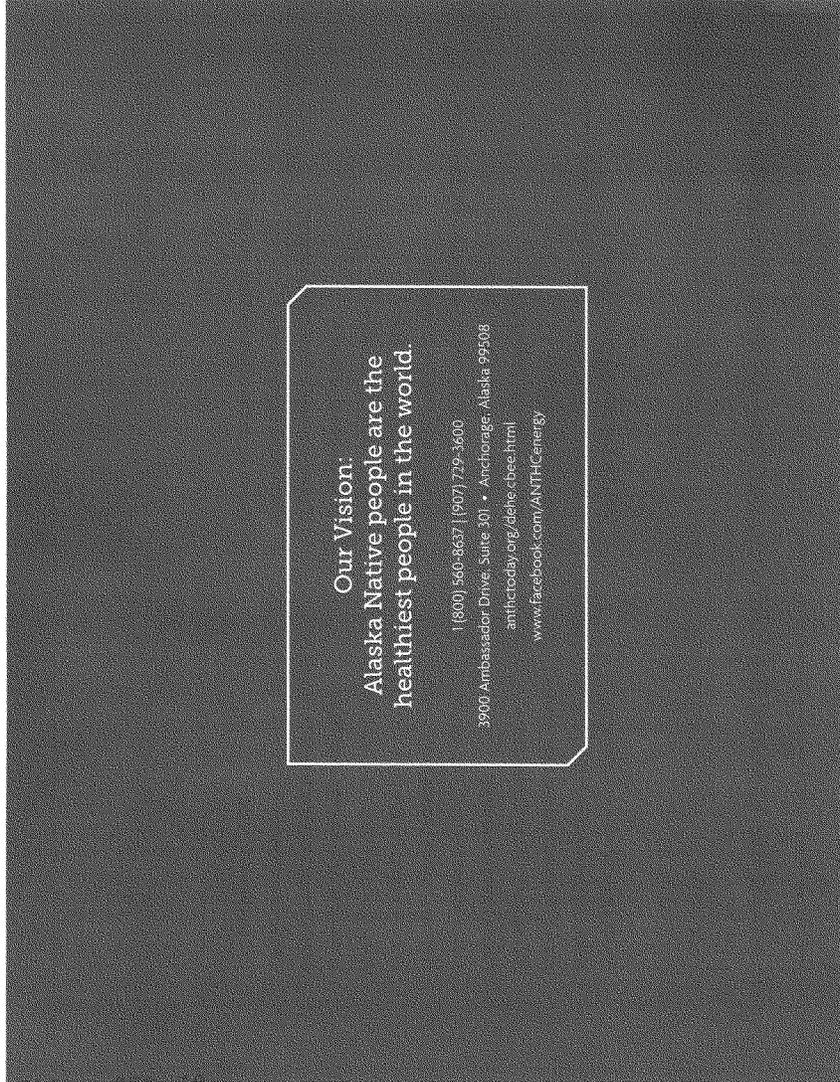
**Provide hands-on training and formal instruction** in partnership with AVTEC.

**Explore different technologies** such as ground source heat pumps and solar water heating.

**Strengthen Statewide Partnerships** to collaboratively develop innovative solutions to address the high cost of sanitation in rural Alaska.

We would like to thank the following partners for their assistance and support:

- |   |   |
|---|---|
| Alaska Department of Commerce                   | Interior Regional Housing Authority           |
| Alaska Department of Environmental Conservation | Kodiak Area Native Association                |
| Alaska Housing Finance Corporation              | Manilaq Association                           |
| Alaska Rural Utility Collaborative              | Metlakatla Indian Community                   |
| Alaska Energy Authority                         | NANA Regional Corporation, Inc.               |
| Alaska Village Electric Cooperative             | Norton Sound Economic Development Corporation |
| Aleutian Pribilof Islands Association           | Norton Sound Health Corporation               |
| Annette Island Service Unit                     | Northwest Arctic Borough                      |
| Association of Village Council Presidents       | Tanana Chiefs Conference                      |
| Bristol Bay Area Health Corporation             | US Department of Energy                       |
| Cold Climate Housing Research Center            | US Environmental Protection Agency            |
| Denali Commission                               | USDA Rural Development                        |
| Indian Health Service                           | Yukon Kuskokwim Health Corporation            |



Our Vision:  
Alaska Native people are the  
healthiest people in the world.

(800) 360-8637 | (907) 729-3600  
3900 Ambassador Drive, Suite 301 • Anchorage, Alaska 99508  
anthctoday.org/dehe.cbee.html  
www.facebook.com/ANTHCentery

**Senator Alexander Statement for the Record****Senate Energy and Natural Resources Committee Hearing on Energy Efficiency Legislation****S. 1047 - A bill to require the Secretary of Energy to review rulemaking proceedings of other Federal agencies for the potential to cause an adverse effect on the cost, time, or difficulty of complying with energy efficiency regulations, guidelines, or standards.**

The Environmental Protection Agency's (EPA) Significant New Alternatives Policy (SNAP) program evaluates and regulates substitutes for ozone-depleting chemicals that have been identified for phase-out under the stratospheric ozone protection provisions of the Clean Air Act. However, EPA has not coordinated with the Department of Energy (DOE) on proposed new rules under the SNAP program. Therefore, appliance manufacturers could be forced to comply with EPA SNAP regulations just a few years before or after they must comply with DOE rules, such as energy efficiency regulations or ENERGY STAR classifications. This legislation would help align various rules and regulations facing appliance manufacturers as they seek to provide energy efficient and environmentally safe products for consumers.

**S. 1048 - A bill to remove the authority of the Secretary of Energy to amend or issue new energy efficiency standards for ceiling fans.**

The Department of Energy has proposed additional energy efficiency regulations for ceiling fans that could lead to significant price increases in an already energy efficiency product. The additional energy efficiency regulations could result in the purchase of fewer ceiling fans, and actually result in greater energy use through the increased use of air conditioning units to cool homes, because the cost to comply with the proposed regulations could add up to \$50 per ceiling fan. According to ENERGY STAR, turning the thermostat up only two degrees and using a ceiling fan can lower air conditioning costs by up to 14%. This legislation would help preserve affordable, energy-efficient options for families who are trying to cool their homes.



April 27, 2015

The Honorable James E. Risch  
 483 Russell Senate Office Building  
 U.S. Senate  
 Washington, DC 20510

Dear Senator Risch:

The Alliance to Save Energy and the American Council for an Energy Efficient Economy write to express our support for S. 1038, the ENERGY STAR Program Integrity Act of 2014.

Since its inception in 1992, the ENERGY STAR program has helped American consumers and businesses invest in energy efficiency and drastically cut energy costs. The program has also helped manufacturers push the research envelope, leading to job creation and the development of transformative technologies. However, despite the decades of proven success, due to a gap in federal law, the manufacturers that voluntarily choose to participate in this program have become targets for unnecessary and costly class action litigation, potentially deterring them from continuing to participate in this important program. S. 1038 will address that gap in the law.

For an appliance to qualify as an "ENERGY STAR" product it must meet-strict guidelines set by the Environmental Protection Agency (EPA), and it must be tested and approved by EPA-recognized laboratories and certification bodies. Even after the products have been approved, the EPA and the Department of Energy (DOE) oversee off-the-shelf testing to ensure these products continue to perform according to ENERGY STAR standards. Occasionally, products are found to be out of compliance and are disqualified. Once a product is disqualified, its manufacturer must initiate detailed product control measures and, if deemed appropriate by the EPA, provide financial reimbursement to consumers. To ensure transparency for the consumer, the EPA also maintains an up-to-date list of products that have been disqualified publically available on its website.

However, despite these effective enforcement procedures, the law currently allows suits to be brought against manufacturers, regardless of whether the EPA has determined that consumers have been harmed and in addition to any remediation measures, including consumer compensation, already ordered. If continued unchecked, these litigation costs could deter appliance manufacturers from participating in ENERGY STAR, harming American consumers in the process.

The Senate legislation would remove this threat of "double jeopardy" and promote the continued, voluntary participation by manufacturers in the ENERGY STAR program.

At a critical time in our economic recovery, manufacturers need sensible policies that incentivize research and development in energy efficiency technologies that save consumers money and create jobs. Thank you for your efforts to protect the important ENERGY STAR program by introducing S. 1038.

Kind regards,

The Alliance to Save Energy

The American Council for an Energy Efficient Economy

cc: Members of the Energy and Natural Resources Committee



**American Chemistry Council Statement for the Record  
S. 720, the “Energy Savings and Industrial Competitiveness Act of 2015”  
Submitted to Senate Energy and Natural Resources Committee  
April 28, 2015**

**Introduction**

The American Chemistry Council (ACC)\* welcomes this opportunity to re-state our support for S. 720, the “Energy Savings and Industrial Competitiveness Act of 2015”. The Council thanks Senators Portman and Shaheen for developing and introducing S. 720 and we thank Senators Murkowski and Cantwell for holding today’s hearing. While ACC supports passage of S.720 in its entirety, we wish to highlight the important contribution that Section 433, the “Sensible Accounting to Value Energy (SAVE) Act,” makes to the bill.

**American Chemistry and Energy Efficiency**

America’s chemistry companies are leaders in energy efficiency. They invent and make products used in high-performance building insulation, windows, and appliances; lightweight plastic packaging and vehicle parts; engine lubricants and fuel additives; compact fluorescent light bulbs, photovoltaic solutions, and energy storage systems; and many others. These markets are significant, and growing.

In today’s highly competitive global commerce, we know that being energy-efficient in our own operations helps our industry reduce costs and maintain U.S. production and jobs. This commitment has led to a 49 percent improvement in energy efficiency for the chemical industry since 1974. Responsible Care® companies have improved energy efficiency by 14 percent since 1992.

It is important to note that having an affordable and a reliable supply of energy inputs is essential to making the U.S. a competitive producer of energy efficient products and services. The chemical industry uses natural gas liquids to make chemistry products that are used to make energy efficiency solutions. There is a direct connection between policies to create a reliable supply of natural gas and a competitive manufacturing sector to produce the products that make the economy more energy efficient.

**Section 433, the “Sensible Accounting to Value Energy (SAVE) Act”**

The “SAVE Act,” originally introduced by Senators Isakson and Bennet, has enjoyed strong bipartisan support since its inception. The bill will help homeowners realize the true value of energy-efficient homes by recognizing that reduced energy costs make these homes more affordable.



April 28, 2015

Page 2

Recent evidence suggests that owners of energy-efficient homes are 32 percent less likely to default on mortgages. Current lending practices don't account for a significant cost of homeownership—utility bills. This bill would provide a flexible and voluntary pathway for lenders to better assess risk and account for energy savings realized by homeowners. The "SAVE Act" would also allow appraisers to more easily include the value of energy-efficient features in the overall value of buildings. We believe this voluntary program will help inform homebuyers about their home purchase and encourage owners to invest in energy efficiency. Furthermore, by encouraging more home improvement projects and unlocking demand for new energy-efficient homes, the "SAVE Act" would create manufacturing and construction jobs. These jobs are essential for strengthening the economic recovery.

#### **Conclusion**

Given the bipartisan nature of the "SAVE Act," we urge the committee to support Section 433 of S. 720. Most products that go into new homes in this country are made right here in the U.S., but product manufacturers who are continually developing new technologies are finding that builders cannot use these new products because the incremental cost in most cases cannot be financed as part of a home buyer's mortgage. Passing S. 720, with Section 433 included, will help unlock manufacturing demand for these innovative new products and significantly reduce homeowners' utility bills.

If you have any questions about ACC's positions on S. 720 and Section 433, please contact Booth Jameson at [Booth\\_Jameson@americanchemistry.com](mailto:Booth_Jameson@americanchemistry.com)

\*The American Chemistry Council (ACC) represents the leading companies engaged in the business of chemistry. ACC members apply the science of chemistry to make innovative products and services that make people's lives better, healthier and safer. ACC is committed to improved environmental, health and safety performance through Responsible Care®, common sense advocacy designed to address major public policy issues, and health and environmental research and product testing. The business of chemistry is an \$812 billion enterprise and a key element of the nation's economy. It is the nation's largest exporter, accounting for twelve percent of all U.S. exports. Chemistry companies are among the nation's largest energy consumers.



**COMMENTS OF THE AMERICAN GAS ASSOCIATION  
ON ENERGY EFFICIENCY LEGISLATION**

**May 12, 2015**

The American Gas Association (AGA) is pleased to submit comments on S. 1029 and S. 869 and respectfully requests their inclusion in the record of the hearing held on April 30<sup>th</sup>, 2015 before the Energy and Natural Resources Committee of the United States Senate.

The American Gas Association, founded in 1918, represents more than 200 local energy companies that deliver clean natural gas throughout the United States. There are more than 72 million residential, commercial and industrial natural gas customers in the U.S., of which 94 percent — over 68 million customers — receive their gas from AGA members. Today, natural gas meets more than one-fourth of the United States' energy needs.

AGA and its member companies are strong advocates for energy efficiency in all direct use applications of natural gas. Nationwide, natural gas utilities supported energy efficiency programs with investments nearing \$1.1 billion in 2012, and similar investments in 2013 reached \$1.5 billion. Through these energy efficiency investments, AGA members helped customers save 136 trillion Btu of energy and offset 7.1 million metric tons of carbon dioxide in 2012.

The American Gas Association supports S. 1029 and thanks its sponsors, Senators Hoeven and Alexander, for their leadership. This much needed legislation will enable the development of fair, and effective energy efficiency standards for residential natural gas furnaces.

First and foremost, AGA is concerned that DOE's current proposal for a new energy efficiency standard for residential natural gas furnaces standard significantly overestimates the associated energy savings and greenhouse gas emission reductions the new standard would achieve, while also unfairly imposing significant economic burdens on many American consumers — especially low-income households.

AGA worked with the American Public Gas Association and the Gas Technology Institute (GTI)<sup>1</sup>, to analyze the real-world emissions and energy usage levels that would result if a significant number of consumers respond to the rule by switching away from natural gas furnaces in favor of other less efficient fuels. The analysis incorporates the results of a national survey of builders and contractors that AGA conducted to assess the appliance and fuel choices that would likely occur under a national condensing furnace standard. According to the survey, about 22 percent of homes with existing non-condensing furnaces cannot be easily retrofitted with a condensing furnace, either because of prohibitive expense or due to local building codes that would prevent the new venting systems. The added cost of buying and installing a condensing furnace to replace a non-condensing furnace ranges from \$1850 to \$2550. GTI's impact analysis indicates significant adverse consequences are likely to accrue under a national condensing rule standard, if the rule is not structured to minimize the likelihood of fuel switching from natural gas to electrical appliances.

The analysis shows that even small degrees of displacement of natural gas appliances would result in outsized adverse effects including greater overall energy usage, higher consumer costs, and increased carbon emissions. In the first year of the program alone, GTI estimates the rule would result in the emission of nearly 350 thousand additional tons of carbon dioxide, an increase of 463 thousand decatherms of energy usage, and added consumer costs nationwide totaling \$45 million. We are deeply concerned that, if not appropriately structured, this rule could prove to be the first energy efficiency standard issued in the history of the Department that has the real-world impact of *increasing* our nation's overall energy consumption and carbon footprint.

If finalized, AGA believes the rule would impose burdensome costs and renovations on many homeowners replacing their natural gas furnaces. According to the Department's own analysis, 66 percent of affected households would see no benefit or bear higher net costs under the proposed rule. Specifically – and again according to DOE's own analysis – 20 percent of households nationwide would see a net life cycle cost increase, and in the South, nearly a third of affected consumers would actually have higher costs under the proposed rule. Low-income consumers would be the hardest hit – 39 percent of low-income consumers in the Southern United States would bear higher costs for home heating as a direct result of the proposed rule.

---

<sup>1</sup> The Gas Technology Institute (GTI) is an independent, not-for-profit technology organization.

To provide all Committee members with a fuller understanding of how the DOE proposed furnace standard would affect real consumers, we include below a more detailed description of the potential impacts on households in one state, the State of New Mexico. New Mexico is a southern state with a proportionately high low-income population, and aptly illustrates the deficiencies of the proposed rule.

The proposed DOE rule will have a significant adverse impact on residents nationwide and particularly in New Mexico. First contrary to the estimate provided by DOE, the New Mexico Gas Company (NMGC) estimates the incremental cost to purchase and install a 92 percent AFUE furnace over a standard 80 percent AFUE furnace – including the cost of additional venting of the furnace and draining condensed water – ranges from \$792 to \$2,050. The weighted average increased cost throughout the state is estimated at approximately \$1,185.

To derive this number, NMGC polled contractors that performed most of the furnace replacements in its service territory. NMGC asked the contractors for any information they had regarding incremental costs that they would charge customers to install a 92 percent AFUE condensing furnace, versus what they would charge to install an 80 percent AFUE non-condensing furnace. Such a significant increase will be particularly detrimental to lower income residents, and especially to a state such as New Mexico with a poorer than average population.

The 2013 US Census American Community Survey 5-year estimates identified 323,074 households in New Mexico with incomes at or below 200 percent of the poverty level, which is the current basis DOE uses as a guideline to determine low-income eligibility. This equates to slightly over 42 percent of the state's population. The savings realized annually over the average 18 year life of a furnace is insignificant compared to the impact the upfront costs would have on almost half of New Mexico's households and their ability to provide for their families.

It should further be noted that the increased initial cost of replacing furnaces with more energy efficiency furnaces already can be detrimental to households of almost any income level, which is why utilities across the nation already offer incentives for customers to install high efficiency equipment. Even with a rebate, many customers opt out of paying the additional cost for an energy efficient furnace.

In New Mexico, where 887,604 citizens are considered low-income and the household median income is \$43,872, the immediate increased outlay for installation that would be imposed by the DOE rules would be potentially devastating to many of the state's citizens. Many in this state have extreme difficulty replacing their existing furnace at any price. A mandate that would add an additional \$1,185 to \$2,000 to that cost could lead to poor decisions and possible safety issues arising from customer's decisions relating to the replacement of their furnace, and any rule that could cause customers to make a less safe decision should be rejected.

DOE is required by statute to demonstrate that any new proposed standard is economically justified. It is hard to understand how the Department can continue on its present course that will clearly leave many Americans worse off than they are today.

S. 1029 would right the course. This provision would require the Department to halt its current rulemaking on residential natural gas furnaces, and instead initiate a negotiated rulemaking involving a diverse group of stakeholders. For the past several months, AGA has participated in discussions about the furnace rule with a diverse group of environmental and energy efficiency advocates and industry representatives. In these discussions, we are considering alternative pathways for the rule that would meet our shared goals for energy savings and consumer benefits. By establishing a negotiated rulemaking process, this bill would provide an opportunity for all stakeholders to contribute to a successful rule that benefits all American households.

AGA also supports S. 869, a bill that will restore the ability of federal installations to benefit from the use of energy efficient, cost-effective, end-use applications of natural gas in the long-term. We thank the sponsors, Senators Hoeven, Manchin, and Donnelly for their leadership on this issue.

This bill would repeal section 433 of the Energy Independence and Security Act of 2007, a provision which mandates elimination of all fossil fuel-generated energy use in new and renovated Federal buildings by the year 2030, replacing the statute with a negotiated energy efficiency provision that will apply to Federal buildings.

The section 433 fossil fuel ban is deeply flawed. Its implementation will severely limit – and ultimately prohibit – adoption of highly efficient technologies using natural gas at federal facilities, such as combined heat and power, fuel cells and waste heat recovery systems. The statute also creates a counterproductive bias in federal policy against clean and affordable natural gas. The United States is now the world's leading producer of natural gas. The Federal government should serve as an example to homes and businesses across the country by demonstrating how this abundant, domestic resource can increase energy efficiency, decrease overall emissions, improve our energy security and save money.

In fact, the Department of Energy's analysis of the fossil fuel ban indicates the provision will impose unacceptably high costs on the Federal government, which will ultimately be borne by tax payers. DOE estimates that Federal construction costs will jump from today's level of **\$30 million** annually to **\$536 million** in 2019, when fossil fuel-generated energy must be reduced by 80 percent. Construction costs for Federal buildings jump again to **\$1.135 billion** annually by 2030, when fossil fuel-generated energy must be eliminated.

This projected surge in federal construction costs amounts to an increase of **3,783 percent**. What the American people will get for this exorbitant expense is a Federal government turning its back on an emerging source of national strength and security: our abundant reserves of natural gas. It is equally vexing that these high costs mean that funds will be diverted from other projects that could meaningfully and cost-effectively increase energy efficiency and reduce greenhouse gas emissions from federal buildings.

We urge the members of the Committee to support both S. 1029 and S. 869. Thank you for the opportunity to provide comments.

April 30, 2015

*The 6*

Dear Senator,

We the undersigned agree that, if implemented correctly, energy efficiency standards mean high-tech jobs, class-leading technologies made in America, energy security and perhaps most important, money saved by every household throughout the country. However, if applied incorrectly, energy efficiency standards can stifle innovation, slow the economy and harm employment, all while not delivering the promised energy savings.

That is why we support Senators Hoeven and Alexander's bill, S.1029, which would amend the Energy Policy and Conservation Act to postpone the Department of Energy's (DOE) final rule on efficiency standards for residential non-weatherized gas furnaces or mobile home furnaces to allow for all stakeholder analysis and negotiations to be completed. The bill gives DOE the opportunity to slow the timing of the residential gas furnace rule until all stakeholders are able to work together to achieve an efficiency standard that meets environmental and economic goals without penalizing families and businesses. It provides the opportunity to get this right, rather than rush to meet a tight deadline.

The proposed DOE rule would establish the minimum efficiency standard for residential gas furnaces at such a high level that more than half of the furnaces shipped today could no longer be able to be manufactured or imported for sale legally in the United States. These non-condensing furnaces, which in 2014 accounted for 51 percent of all furnaces shipped, are predominantly used in warmer regions of the country. When households in these regions replace their furnace, they will be required to install a more costly product and a more complex installation process. This would place an unfair economic burden on households in warmer climates that may not need such a highly efficient unit in the first place. Furthermore, the analysis by DOE does not fully reflect the costs to consumers. Our data shows that an average homeowner would be forced to pay an additional \$350 in unit costs and an additional \$1,500-\$2,200 in installation costs.

The rule would also unfairly burden lower income individuals and families. In fact DOE changed their methodology on the impact incorporating a new study after the American Gas Association testified before DOE about the impacts on the low-income Americans.

The Gas Technology Institute predicts that the proposed rule would impose an additional \$44.9 million in energy costs nationwide and produce an additional 348,589 tons of CO<sub>2</sub> per year. We cannot support an efficiency standard that imposes higher costs, requires more energy, and produces more emissions.

S.1029 would require DOE to hit the pause button and engage in the ongoing negotiations already taking place amongst a broad group of stakeholders. As discussions between stakeholders have shown over the past several months, there are alternatives that would meet our shared goals for energy savings and consumer benefits. The negotiated rulemaking process included in S.1029 will help us reach consensus.

S.1029 will expose the Department of Energy's previously hidden analysis to the light of day, subjecting it to a deeper analysis by affected stakeholders, who will then be able to determine whether the proposed nationwide standard is technically feasible and economically justified. If it is found unfeasible, the bill requires DOE to assemble a broad stakeholder group to establish a negotiated, consensus standard, more suitable to existing technology and considerate of economic and climate realities.

We encourage you join us in supporting S.1029, and to lend your support for a balanced and economically justified approach to the furnace marketplace.

Sincerely,

ACCA – The Indoor Environment & Energy Efficiency Association  
Air-Conditioning, Heating & Refrigeration Institute  
American Gas Association  
American Public Gas Association  
Heating Air-conditioning & Refrigeration Distributors International  
National Association of Home Builders



**ALLIANCE  
TO SAVE ENERGY**

*Using less. Doing more.*



**AMERESCO**  
Green • Clean • Sustainable



**ACEEE**  
American Council on an Energy-Efficient Economy



**AGA**  
American Gas Association



**American Public  
Gas Association**



**APPA** American  
Public Power  
Association



**CHP ASSOCIATION**  
COMBINED HEAT & POWER  
RELIABLE ENERGY, DELIVERED EFFICIENTLY.



**Constellation**  
An Exelon Company



**EEL Edison Electric  
Institute**  
Power by Association®



**FPCC**  
Federal Performance  
Competing Coalition



**Fuel Cell &  
Hydrogen Energy  
Association**

April 29, 2015

Dear Senator,

The undersigned write to ask for your support of S. 869, the All-Of-The-Above Federal Building Energy Conservation Act of 2015, to improve federal energy use management. S. 869, introduced by Senators Hoeven, Manchin and Donnelly, was developed by a diverse coalition of industry, efficiency and environmental advocates. The result of that process is a broadly-supported, bi-partisan bill that dramatically improves energy efficiency. The proposal would save taxpayers money by enhancing the energy efficiency of federal buildings. It would repeal a requirement regarding the reduction and eventual elimination of fossil fuel-generated energy consumption in new and renovated federal buildings, and strengthen broader energy efficiency targets and other direction to federal agencies.

A part of Section 433 of the Energy Independence and Security Act of 2007 was intended to reduce fossil fuel-generated energy use in new and renovated federal buildings, with a 100 percent reduction required by the year 2030. However, due to the complexities of the law, the federal government cannot find a long-term path to compliance. Thus, there are continuing concerns that it could discourage comprehensive energy efficiency renovations, stifle innovations and result in increased energy costs for the federal government.

S.869 would repeal this requirement, but strengthen several existing federal energy management provisions to ensure large energy savings in the coming years. These fuel-neutral provisions would:

- Extend overall energy use intensity reduction targets of 3% a year for federal buildings out to 2017 to continue the focus on reducing building energy waste;
- Ensure that significant alterations and additions to federal buildings, such as new roofs, meet minimum efficiency levels;

**Honeywell**

**Johnson Controls**

**LOCKHEED MARTIN**

**NAESCO** National Association of Energy Service Companies

**National Rural Electric Cooperative Association**  
A Trane® Energy Cooperative

**OWENS CORNING**

**PIMA**  
POLYISOCYANURATE INSULATION MANUFACTURERS ASSOCIATION

**Schneider Electric**

**SIEMENS**

**TRANE**

**United Technologies**

- Use commissioning of large federal buildings to ensure that their energy systems are operating as designed – this has been shown to achieve significant energy savings at modest cost; and
- Encourage use of energy management systems and implementation of cost-effective capital measures in large federal buildings, in part by using private financing and expertise, such as in Energy Savings Performance Contracts and Utility Energy Service Contracts.

These provisions would give federal building energy managers flexibility to achieve reductions in federal energy consumption in a cost-effective manner, encourage the adoption of energy efficient technologies and practices, and spur the retrofits of federal buildings.

We greatly appreciate your leadership in building broad support behind a legislative package that will ensure that the federal government demonstrates best practices in reducing wasted energy and wasted taxpayer money.

Sincerely,  
 Alliance to Save Energy  
 Ameresco  
 American Council for an Energy-Efficient Economy  
 American Gas Association  
 American Public Gas Association  
 American Public Power Association  
 Combined Heat and Power Association  
 Constellation Energy  
 Edison Electric Institute  
 Federal Performance Contracting Coalition  
 Fuel Cell and Hydrogen Energy Association  
 Honeywell  
 Johnson Controls Inc.  
 Lockheed Martin  
 National Association of Energy Service Companies  
 National Rural Electric Cooperative Association  
 Owens Corning  
 Polyisocyanurate Insulation Manufacturers Association  
 Schneider Electric  
 Siemens  
 Trane  
 United Technologies

April 29, 2015

The Honorable Lisa Murkowski  
Chairman  
Energy and Natural Resources Committee  
709 Hart Senate Office Building  
Washington, DC 20510

The Honorable Maria Cantwell  
Ranking Member  
Energy and Natural Resources Committee  
511 Hart Senate Office Building  
Washington, D.C. 20510

Dear Chairman Murkowski and Ranking Member Cantwell:

As leading designers and supporters of energy efficient buildings across America and the world, we urge you to oppose the repeal of Section 433 of the Energy Independence and Security Act of 2007 contained in the Portman-Shaheen energy efficiency legislation.

Section 433 is a cornerstone of the federal government's sustainability strategy. It requires new and majorly renovated federal buildings to hit fossil fuel reduction targets until zero consumption in 2030. If a building cannot hit these targets, then an agency can request a waiver of these targets.

Although some have claimed that Section 433's energy consumption requirements are unrealistic, the facts tell a different story. Today, design and construction companies across the country are designing buildings that meet, and in some cases exceed, the current targets. In fact, Section 433 goals have enabled design firms to develop new design strategies that are now being used to help private-sector building owners reduce their energy loads.

Recognizing that these goals, while achievable, are complex, a diverse group of stakeholders have worked closely with the U.S. Department of Energy (DOE) to ensure the development of workable regulations to implement Section 433. We were pleased to see that DOE upheld its commitment to completing this rule when it released a supplemental rule in late 2014 that addressed each of the stakeholders' concerns, while inviting additional comments.

Section 433 has helped the government reduce the energy consumption of federal facilities across the country. This is a win not only for the environment, but for taxpayers as well, as federal agencies see their energy costs go down. At a time when we are looking to reduce government spending and promote clean energy, it makes no sense to retreat on policies that are achieving positive results. Therefore, we urge you to oppose the repeal of Section 433.

Sincerely,

[au]workshop  
A. James Laspesa AIA  
Accord Architects and Engineers  
ACE Design Group, LLC  
Adrian Smith

ags-ARCHITECTS  
Alicia Ravetto Architect  
Alliance  
Anderson Hallas Architects, PC  
Anis Building Enclosure Consulting

Antinozzi Associates  
 Antonio Silva Rendeiro Architect  
 Antunovich Associates  
 APArchitects, LLC  
 ARCHforensic  
 Archicon Services, Inc.  
 Archimania  
 ArchiTech Consulting, Inc.  
 Joel Smith, AIA Architect  
 Architects Design Group  
 Architects Hawaii  
 Architects McDonald, Soutar & Paz  
 Architectural Alliance, Inc.  
 Architecture 2030  
 Architecture Plus  
 ArchWorks, Inc.  
 Arianna Braun Architects PLLC  
 Arimse Architects, LLC  
 Artech  
 ARTifice, LLC  
 Ashley McGraw Architects, DPC  
 Atelier Ten  
 Ayers Saint Gross Architects + Planners  
 Azizi Architects, Inc.  
 Baer Architecture NM  
 BAR Architects  
 Barnard & King Architects  
 Bartlett Architects, AIA  
 Bartlett, Amoruso & Recce - Architects,  
 P.C.  
 baselab.  
 Bay Design Associates Architects  
 Becker Morgan Group, Inc.  
 Berggren Architects  
 Bergmeyer Associates Inc.  
 Bernheim+Dean Inc.  
 BKSK Architects  
 BONE Structure  
 Booth Hansen  
 Boulder Associates  
 BQE Software, Inc  
 Bruner/Cott & Associates Inc.  
 Build Efficiently, LLC  
 Built Environment Engineers  
 BuroHappold Engineering  
 BWS Architects  
 C&H Architects  
 CannonDesign  
 Carl Kaiserman, AIA  
 CDM Smith  
 Celeste Allen Novak Architect PLLC  
 CHA  
 Chamblee +Associates, LLC  
 Chapman Harvey  
 Chenault & Associates  
 Chris Ferger Architects, LLC  
 clark huesemann  
 Closed Loop Advisors  
 CMA Architects & Engineers LLP  
 Cohen Freedman Encinosa & Assoc.  
 Architects P.A.  
 Colley Architects, PC  
 Communitas Architects, Inc.  
 Connolly & Hickey Historical Architects  
 COOKFOX Architects  
 COOPER CARRY  
 COULSON  
 cox graae + spack architects  
 Cox Group Architects LLC  
 Cozzarelli Cirminiello Architects  
 Creative West Architects  
 Croxton Collaborative Architects  
 Crozier Architecture, LLC  
 CSArch  
 CTA Architects PC  
 CUBE design + research  
 Cuninghams Group Architecture  
 CVA  
 CWA Architecture  
 C-Wise Design and Consulting

Cyntergy AEC  
 Dancart Architecture  
 Darlene S. Riemer, Architect, P.C.  
 Dattner Architects  
 Dave Henry Architecture P.C.  
 Dave Robinson Architects  
 David B. Albright, AIA, Architect  
 David Miertschin  
 David Sisson Architecture PC  
 David Tanza Architect  
 Davis Partnership Architects  
 dennis em bopp - architect, pllc  
 Dennis McNeal Architect, LLC  
 Design Methods Inc  
 Design Team, LLC  
 Design-1-West  
 Dewberry  
 DiMella Shaffer Associates, Inc.  
 DLR Group  
 DMKING Consulting LLC  
 DNM Architect  
 Dolle Architects  
 Doris Nathan Architect  
 DPA INC  
 Dwight Gregory and Associates  
 DWL Architects & Planners, Inc. of NM  
 Eckenhoff Saunders Architects  
 Edward C. Abrahamian, AIA Architect  
 Edward Dugger + Associates, PA  
 Edward G Kelley Architect  
 Edward R. Acker, AIA  
 ehdd  
 Elise Fett and Associates  
 Elizabeth Eason Architecture LLC  
 ELLENZWEIG  
 emcee design  
 Encompass Architects, P.C.  
 Endelman & Associates PLLC  
 Ennead Architects  
 EnvironMental Design  
 Environmental Systems Planning and  
 Design Consultants  
 Environmental Works  
 Eskew+Dumez+Ripple  
 Evenson Architecture  
 EwingCole  
 Ferguson Glasgow Schuster Soto, Inc.  
 FGM Architects, Inc  
 Floyd W. McCollum, Jr., AIA  
 Frank Accordini, AIA Architect  
 Frederick + Frederick Architects  
 Frost Architecture  
 FXFOWLE  
 Garapolo & Associates  
 Gary Gladwish Architecture  
 Gary Rentsch Architects  
 Gast Architects  
 GBMA Architecture LLC  
 Geier Brown Renfrow Architects, LLC  
 Geoffrey Michael Varga, Architect  
 George W. Johannes, AIA Architect  
 GFA Architecture  
 GGLO  
 gkkworks  
 gordon architecture inc  
 Greenstone Architecture, PLLC  
 Gregory John Burke | ARCHITECT, PA  
 Grimm + Parker Architects  
 Group 1.6 LLC  
 GSLA  
 Gwynne Pugh Urban Studio  
 Habitech Planning and Design  
 Habza Architecture PC  
 Hafer Associates  
 Haizlip Studio  
 Half Associates  
 Hardlines Design Company  
 Harley Ellis Devereaux  
 Harmony Architecture  
 Harris Welker Architects

Hart STUDIO LLC  
 Heckman & Associates, P.A.  
 Heights Venture Architects, LLP  
 Heiple +Wiedower Architects PLLC  
 Helix Architecture + Design  
 Hellmuth + Bicknese Architects  
 Hennebery Eddy Architects  
 HERA, Inc.  
 High Plains Architects, P.C.  
 HIRSCH GROUP ARCHITECTS  
 HKS, Inc.  
 HMC Architects  
 HMFH Architects, Inc.  
 HOK  
 Hood Miller Associates  
 Howorth & Associates Architects  
 Hromadka Associates  
 Hubbell & Hubbell  
 IBI Group Architects  
 In Balance Green Consulting  
 Independent  
 INSITE strategy + architecture  
 Integra  
 INVISION  
 Isenberg + Associates  
 J.P. Copoulos, Architect  
 Jack Hillbrand, AIA  
 JAHN  
 JAN C. RUSSELL, AIA  
 Jason K Demarest, Architecture  
 JCS Architects  
 Jennifer Birks Architecture  
 JGA Architects, PC  
 JKA Consulting  
 John B. Collins Architect, LLC  
 John Kalmon Architect LLC  
 John S. Reynolds FAIA  
 Jones Design Studio  
 Jones Studio, Inc.  
 Joseph A. Krawiec, AIA, LLC  
 JVArchitecture  
 K. Norman Berry Associates Architects  
 KAL Architects, Inc.  
 Kalin Associates  
 Kaplan Architects  
 Karl Hokanson Architect  
 Katherine Austin, AIA, Architect  
 Kendall/Heaton Associates, Inc.  
 Kenney Architects, P.C.  
 Kevin Jensen, Architect  
 Kipnis Architecture + Planning  
 Kirksey  
 Kiss + Cathcart, Architects  
 Kittner & Pate Design Associates  
 KlingStubbins Inc (a Jacobs Co.)  
 Kohn Pedersen Fox Associates PC  
 KPMG, LLC  
 Kristi Byers, Architect APC  
 Kubat Consulting LLC  
 Kurzman Architecture, LLC  
 Labarre Associates  
 Lachin Oubre & Associates  
 Lake | Flato Architects  
 Landmark Architects  
 Landon Bone Baker Architects  
 Larson and Darby Group  
 Lavallee Brensinger Architects  
 Lehrer Architects LA  
 Lindsay Suter Architects  
 LMD Architects  
 LMN Architects  
 Looney Ricks Kiss  
 Lord Aeck Sargent  
 Louviere, Straton & vYokel LLC  
 Lunz Prebor Fowler Architects  
 M J Neal Associates, Architects PLLC  
 M3D Consulting LLC  
 Manson-Hing Architecture  
 Mark D. Geiselman Architect, PC  
 Mark Rylander, AIA

Marotta/Main Architects  
 Martin Holub Architects  
 Martin Sandino Architecture + Planning  
 Mary Archer AIA  
 Matthew Millan Architects, Inc.  
 McCall & Associates-AIA-Architects  
 Method Architecture  
 Meyer, Scherer & Rockcastle. Ltd  
 MG Arch LLC  
 Michael Doty Associates, Architects  
 Michael Joseph Holtz. FAIA Architect  
 Miller Hull Partnership  
 MKM Design  
 MKSD architects  
 MLC Architects, LLC  
 mode associates  
 Moreland Architecture + Sustainable Design  
 Morris Architects Inc.  
 Moshier Studio  
 ms consultants, inc.  
 MS&R Ltd.  
 Munn Architecture-PC  
 Musser  
 N. A. Kershaw, AIA  
 NBBJ  
 NoackLittle Architecture & Interiors  
 NWS Architects, Inc.  
 o2 Architecture  
 Obra Architects  
 Oculus Inc.  
 OPN Architects  
 Orcutt Winslow  
 Oregon Health & Science University  
 Ossolinski Architects, PLLC  
 Overland Partners Architects  
 Pacheco Ross Architects  
 Pacific Studio Architecture  
 Packard Design  
 PAE  
 Page & Turnbull, Inc.  
 Page Southerland Page, Inc.  
 Palms Hawaii Architecture LLC  
 Papesch Associates  
 Parkhill, Smith and Cooper, Inc.  
 Patrick E. Heise, AIA  
 Patriquin Architects  
 Paul J. Levine, Architect  
 Paul Weissman Architects Inc  
 Payette  
 PBDW Architects  
 PBS/AAD  
 Pelli Clarke Pelli Architects LLP  
 Perez, APC  
 Perkins Eastman  
 Perkins+Will  
 Peter Blaubeux AIA  
 Peter J. Arsenaault, Architect  
 Peter T. Gross Architects, P.A.  
 PHB Architects  
 Philip Franks Architects  
 Philip Jones Architect, PLLC  
 Phillips | Sekanick Architects  
 Pickard Chilton  
 Pier Fine Associates  
 Pirece/Cooley Architects  
 Poirier + Associates Architects  
 Potter Lawson  
 pwg architecture  
 Quad3 Group, Inc.  
 Quinn Evans Architects  
 R. M. Shanahan Architects, Inc.  
 r4 llc  
 RB+B Architects, Inc.  
 RBDR, pllc  
 RDM Architecture  
 Red Iron Architects  
 RHA  
 Rice-Stromgren Architects  
 RLC Architects, P.A.  
 Rob Walker Architects, LLC

Robert F Ladau AIA PC  
Robert Krone Architect, P.C.  
Robson Forensic, Inc.  
Ron Neggers, Architect  
Ronald Young AIA, Architect  
Ross Barney Architects  
RS&H  
RTKL  
Ryan Group Architects  
SA ARCHITECTS, LLC  
Sandoval Moots architect LLC  
Santiago Morrice Ramirez  
Sara E.F. Gensburg Ltd  
Sasaki Associates  
Scarmack Architecture  
Schapira Architecture LLC  
schemata workshop, inc.  
Scott Payette Architects  
sDs - Sharkov Design Studio  
Selser Schaefer Architects  
SERA Architects  
Serena Sturm Architects, Ltd.  
Siegel & Strain Architects  
Simply Stated Architecture, PC  
Skidmore, Owings & Merrill, LLP  
Smith Architectural Studio  
Smith Gee Studio  
SmithGroupJJR  
Smithpong & Rosamond Associates, Inc  
SMMA  
Sorrento Consulting, LLC  
SSA Architecture  
Steffen + Schwerin Architects, Ltd.  
Stephen R. Knutson, AIA, Architect  
Steven K. Nose, Architect  
Steven Rhodes Architect  
Stirling/Brown Architects, Inc.  
Stock & Associates  
Strada  
Straus-Edwards Associates, Architects  
Street Dixon Rick Architecture, PLC  
Strollo Architects, Inc.  
Studio 1 Architects Inc  
Studio Carver Architects  
Studio E Architects  
Studio Ma  
studioB design  
Studios Architecture  
Sunset Consultants  
SYNCRO architecture studio  
Szostak Design Inc  
Talent Architectural Studio  
TDSi - The Design Studio, inc.  
Tekton Architecture  
TerraLogos, pc  
Terrapin Bright Green  
Texan Building Solutions  
THA Architecture, Inc.  
The Abo Group  
The Architect's Collaborative  
The Beck Group  
The FWA Group, P.A.  
The Lamb Associates Architects Inc  
The McIntosh Group, LLC  
The Miller Hull Partnership  
The Monticciolo Company  
The Oak Hill Fund  
The Portico Group  
The Sheward Partnership, LLC  
The Write Image  
Thinking Leadership  
Threshold Acoustics LLC  
Tim Brown Architecture, LLC  
Tipping Structural Engineers  
TL Stroh Architects Ltd.  
TLC Engineering for Architecture  
Tom Bassett-Dilley Architect, Ltd  
Toolis  
Town Planning & Design  
Tsoi/Kobus & Associates

Urban Architecture Studio  
Urban Bobcat Architects, PC  
urbandesigner.com  
Valerio Dewalt Train Associates  
Vaughn Design Studio  
Ver Ploeg Architecture  
Vinci-Hamp Architects, Inc.  
Vocon Partners  
VSBA, LLC  
W. E. JACKSON CORPORATION  
Wauters Design Group  
Webb & Company Architects  
Weber Thompson  
WGW Architects, Inc.  
Whitney Architects Inc.  
Wight & Company  
William Finnerty architect  
William R Massingill AIA  
William Rawn Associates, Architects, Inc.  
Wilson Consulting Inc  
WLC Architects, Inc.  
WRNS Studio  
WSP | Parsons Brinckerhoff  
WTW Architects  
ZeroEnergy Design  
ZGF Architects

**Testimony of the American Public Gas Association before the U.S.  
Senate Committee on Energy and Natural Resources hearing on  
Energy Efficiency Legislation on April 30th, 2015**

**A Consumer Perspective**

On behalf of the American Public Gas Association (APGA), thank you for the opportunity to submit testimony for the record to the Senate Committee on Energy and Natural Resources hearing on Energy Efficiency Legislation.

APGA is the national association for publicly owned natural gas distribution systems. There are approximately 1,000 public gas systems in 37 states and over 720 of these systems are APGA members. Publicly owned gas systems are not-for-profit, retail distribution entities owned by, and accountable to, the citizens they serve. They include municipal gas distribution systems, public utility districts, county districts, and other public agencies that own and operate natural gas distribution facilities in their communities. Public gas systems' primary focus is on providing safe, reliable, and affordable service to their customers.

APGA has the privilege of representing the views of American natural gas consumers. We represent the homeowners and small businesses that rely on affordable natural gas to heat their

homes, cook their meals, power their restaurants, operate small manufacturing entities, and service businesses.

Our written testimony will focus on the Senate Bills listed below;

- S. 720 (Portman), the Energy Savings and Industrial Competitiveness Act of 2015.
- S. 1029 (Hoeven), a bill to amend the Energy Policy and Conservation Act to prohibit the Secretary of Energy from prescribing a final rule amending the efficiency standards for residential non-weatherized gas furnaces or mobile home furnaces until an analysis has been completed, and for other purposes.

**S. 720 (Portman), the Energy Savings and Industrial Competitiveness Act of 2015.**

APGA has great interest in S. 720 because public gas systems' primary focus is on providing safe, reliable, and affordable service to their customers. Our members serve homeowners and small businesses, which rely on affordable natural gas to heat their homes, cook their meals, and service businesses of all types. As the nation continues to discuss how to manage air pollutants, the direct use of natural gas, the increased use of renewable energy and most importantly the growth of energy efficiency programs must be part of not just the climate debate but also part of the larger air quality discussion. APGA and our members strongly believe in the effective stewardship of our environment, and recognize the unique and important role natural gas plays in helping our nation achieve better air quality, while at the same time consuming our natural resources responsibly. Section 433 creates a bias in federal policy at odds with the important role that domestically abundant, clean and affordable natural gas can serve in meeting the energy

needs of not only federal buildings, but the country as a whole. That is why we support the repeal of Section 433 of the Energy Independence and Security Act of 2007 (EISA 2007). The language found in S. 720 (as well as S.869) would repeal Section 433 of EISA 2007 while strengthening several existing federal energy management provisions to ensure large energy savings in the coming years. These fuel-neutral provisions include:

- The extension of overall energy use intensity reduction targets; and
- Ensuring that significant alterations and additions to federal buildings meet minimum efficiency levels; and
- Utilizing the commissioning of large federal buildings to ensure that their energy systems are operating as designed; and
- Encouraging the use of energy management systems and implementation of cost-effective capital measures in large federal buildings.

By restoring the ability of federal installations to utilize natural gas, federal energy managers will be able to use energy efficient, cost-effective end-use applications of natural gas in the long-term. The benefits will save money for taxpayers as well as provide measurable environmental benefits.

The mandate seeks to reduce fossil fuel use by 65% by 2020 with total elimination by 2030. DOE's own estimates project federal construction costs will jump from today's level of \$30 million annually to over \$1.1 billion annually by 2030 as a direct result of this provision.

The mandate prohibits both the ultra-efficient direct use of natural gas in federal buildings and the use of gas-fired generation, which is the generation of choice today by most utilities in the nation to minimize the effects of greenhouse gasses.

Federal agencies are already required to increase energy efficiency under the Energy Policy Act of 2005, the Energy Independence and Security Act of 2007, and Executive Order 13514.

Section 433 would restrict the adoption of high-efficiency technologies to meet these statutory mandates – technologies such as combined heat and power (CHP), which is often fueled with natural gas.

S. 720 also addresses the role of DOE in the energy code development process. Model building energy codes are developed by private organizations (e.g. the International Codes Council (ICC) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers), updated every three years and adopted by state and local governments. DOE plays a significant role in their development, and also works with states to encourage adoption and enforcement.

Unfortunately, DOE's role in code development has expanded, moving beyond the original authorization of a "technical advisor" to that of advocate for certain energy goals, and for certain products or technologies. DOE has used federal funding to "incentivize" states to adopt the latest codes. APGA supports this aspect of S. 720, but also urges that it ensure DOE's neutrality in the code development process.

Section 101 improves this process by increasing transparency within DOE, but additional safeguards are necessary to prevent DOE from advocating for specific products or technologies and seeking requirements that are not proven to be cost-effective.

Consumers deserve a reasonable return on their investment when it comes to required energy efficiency improvements. Earlier versions of the energy codes were far more cost-effective and consumers saw a big “bang for their buck.” But now, the codes include very costly requirements that do not have the same return on investment. An average home built to the 2012 energy code, compared to the 2009 energy code, would add thousands of dollars in construction costs, and it would take up to 17.3 years to recoup the additional cost assuming the technology does not need to be replaced.

While S. 720 does improve the process, we believe more needs to be done to ensure that the best energy codes are being developed. The DOE’s appropriate role is as a source of technical expertise in the development of energy efficiency codes and standards for buildings and appliances and not a partial advocate picking winners and losers. The importance of maintaining a bright line between technical consultations and policy advocacy cannot be stressed enough.

**S. 1029 (Hoeven), a bill to amend the Energy Policy and Conservation Act to prohibit the Secretary of Energy from prescribing a final rule amending the efficiency standards for residential non-weatherized gas furnaces or mobile home furnaces until an analysis has been completed, and for other purposes.**

By way of background, the DOE proposed a direct final rule (DFR) in 2011 that, among other things, increased the federal minimum efficiency for natural gas furnaces from 78% nationwide to 80% annual fuel utilization efficiency (AFUE) in twenty southern United States and to 90% AFUE in thirty northern states. The end result of the proposed rule would have amounted to a ban on negative pressure vented furnace systems (non-condensing furnaces) in northern states. For residential consumers in northern states, it would have eliminated the low cost option for heating homes and would have caused fuel switching, especially among lower income homeowners, away from efficient natural gas furnaces to much less efficient electric heating options due to the first costs associated with the 90% furnace mandated by DOE.

While APGA and its members are strong supporters of energy efficiency, we were concerned that this rule would ultimately undermine efficiency goals while significantly increasing consumer costs. The DFR would have deterred many consumers, especially in low income brackets, from purchasing natural gas furnaces given that the furnaces that would meet these new efficiency standards are condensing furnaces which require additional venting. APGA believed that the additional expensive venting costs that consumers would have faced as a result of this rule would deter consumers from purchasing replacement natural gas furnaces and result in fuel switching to less efficient electric heaters/furnaces in the retrofit market as the front cost to install condensing furnaces will be much higher.

The DFR process is intended to be an expedited rulemaking process for noncontroversial issues. If DOE received any adverse comments, it was supposed to withdraw the DFR and proceed with notice-and-comment rulemaking. Despite receiving comments opposing the DFR 90% standard

from over 30 stakeholder groups, including APGA, DOE ruled that it did not receive adverse comments warranting withdrawal of the DFR. The DFR furnace rule was supposed to take effect in May 2013.

In December, 2011 APGA filed a petition for review of this rule in the U.S. Court of Appeals for the D.C. Circuit. APGA was asked to engage in a mediation process with DOE and the Department of Justice, which was representing DOE, to a judgment on the merits. The mediation resulted in a joint settlement, approved by the U.S. Court of Appeals on April 24, 2014, that resulted in the DFR being vacated. As part of the settlement motion, DOE agreed to undertake a new rulemaking proceeding within one year to consider the appropriate standards.

Unfortunately, DOE's new proposed standard posted in March of this year adds insult to injury. It is now proposing a 92% AFUE nationwide, which will require all homes, nationwide, to utilize the higher cost condensing furnace after the compliance date. The high initial costs associated with the purchase and installation (including in many homes challenging and costly venting issues) will force many residential customers—particularly those in warmer climates and in lower income groups—to forego the use of natural gas fired furnaces and instead install less expensive and less efficient home heating alternatives. By DOE's own numbers, which are, we believe, very much understated, over 20% of the homes nationwide will experience a net cost (versus a net saving) by being required to install 92% AFUE furnaces. This percentage skyrockets to 31% in the south on average and to 39% for low-income households in the south. It was, of course, to prevent such lopsided adverse regional results that Congress, at the request of the efficiency groups, among others, amended the Energy Policy and Conservation Act in

2011 to authorize DOE to set regional efficiency standards – an option that DOE has ignored in the pending NOPR despite the demonstrably adverse impacts in the south.

The language in S. 1029 would allow the stakeholders to engage in meaningful conversations to develop a proposal that will continue to promote energy efficiency while not adversely impacting homeowners. This provision would require DOE to halt its current rulemaking on residential natural gas furnaces, and to instead initiate a negotiated rulemaking involving a diverse group of stakeholders. By establishing a negotiated rulemaking process, would provide all of the stakeholders with time to develop a successful approach that benefits all American households.

APGA is a longstanding supporter of energy efficiency and will continue to be. In fact, the direct use of natural gas is 92% efficient on a full fuel cycle basis. Unfortunately, DOE's proposed furnace rule would push many consumers to purchase less efficient heating alternatives, to the detriment of the nation as a whole.

**Conclusion**

APGA appreciates the opportunity to submit testimony to the Committee regarding these critical natural gas and public interest issues. We stand ready to work with the Committee on these and all other natural gas issues.



Shaping Tomorrow's  
Built Environment Today

Submitted Testimony of

Thomas H. Phoenix, P.E., FASHRAE

Society President of ASHRAE

To the

U.S. Senate

Committee on Energy and Natural Resources Committee

April 30, 2015

Hearing on Energy Efficiency Legislation

Chairwoman Murkowski, Ranking Member Cantwell, and members of the Committee, thank you for the opportunity to submit testimony for what will be one of the most important hearings on energy efficiency legislation in recent memory.

My name is Tom Phoenix, and this year I am President of ASHRAE. Founded in 1894, ASHRAE is a global organization of over 53,000 members. The Society and its members focus on building systems, energy efficiency, indoor air quality and sustainability within the industry. Through research, standards writing, publishing and continuing education, ASHRAE shapes tomorrow's built environment today<sup>1</sup>.

ASHRAE's Mission is to advance the arts and science of heating, ventilating, air conditioning and refrigerating to serve humanity and promote a sustainable world. In pursuit of this, ASHRAE has been engaged in the development of many of the bills that are the focus of this hearing. While the Society is supportive of many of these bills, we also have some concerns, and ideas for improvement. Our thoughts on these matters are presented below, and we welcome continued dialogue on these matters, as we seek to build consensus on the best ways to solve our evolving energy, water, and indoor air quality challenges.

### Support for Building Energy Codes

Many bills in Congress touch on building energy codes in one form or another, and it is easy to understand why. The nation's model residential and commercial building energy codes are developed by the International Code Council (ICC) and ASHRAE<sup>2</sup>. These codes have the potential for substantial energy, economic, and environmental benefits. For instance, a study by the Pacific Northwest National Laboratory (PNNL) of the U.S. Department of Energy's (DOE) Building Energy Codes Program (BCEP) found the cumulative greenhouse gas emissions reductions from the Programs' activities have been significant, totaling nearly 3.9 billion metric tons, or approximately three-fourths of all energy-related emissions in the U.S. in 2012<sup>3</sup>. The study also concluded that since the Program's inception 20 years ago,

*"cumulative FFC [full-fuel-cycle] energy savings from 1992 – 2012 are estimated to be approximately 4.2 quads and cost savings to consumers have been more than \$44 billion. These savings have resulted primarily from the Program's activities which upgrade the model energy codes, accelerate their adoption by states and localities, and improve code compliance"<sup>4</sup>.*

While these figures are impressive, realizing the full extent of these benefits requires the many disparate elements of the building industry to work together in harmony to facilitate the development, adoption, and compliance with the building energy codes. Notably, several elements of the Energy

<sup>1</sup> For additional information on ASHRAE, please visit [www.ashrae.org](http://www.ashrae.org).

<sup>2</sup> For additional information on the development of Standard 90.1, see the portion of this document entitled "Appendix: An In-depth Look at ASHRAE Standard 90.1".

<sup>3</sup> Pacific Northwest National Laboratory. 2014. "Building Energy Codes Program: National Benefits Assessment, 1992-2040". Richland, Washington: Pacific Northwest National Laboratory.

[http://www.energycodes.gov/sites/default/files/documents/BenefitsReport\\_Final\\_March20142.pdf](http://www.energycodes.gov/sites/default/files/documents/BenefitsReport_Final_March20142.pdf)

<sup>4</sup> Ibid.

Savings and Industrial Competitiveness Act (S.720, commonly known as Portman-Shaheen) bolster these efforts.

The Energy Savings and Industrial Competitiveness Act would support the development of Standard 90.1 by requiring DOE to provide technical assistance to model building energy code development organizations such as ASHRAE in evaluating the estimated energy savings and related economic considerations of energy standard proposals or revisions, and building energy analyses and demonstrations.

**While ASHRAE supports these provisions in Portman-Shaheen, we strongly oppose any efforts to limit, in any way, DOE’s participation in the development, adoption, and compliance of building energy codes. Instead, ASHRAE believes efforts to improve compliance should be increased.**

Elevating state building energy code compliance is an area likely rich with potential. While data on state code compliance rates is often limited or incomplete, a comprehensive study<sup>5</sup> conducted by the Institute for Market Transformation found that compliance rates of many states is between 25 and 80%, with some as low as 3%. Among the report’s most interesting findings is that increasing compliance rates have significant returns on investment, with every \$1 used to improve compliance yielding \$6 in energy savings.

The provisions in S.720 would help increase state and local building energy code compliance through required certifications, the availability of incentive funding, and annual reporting requirements.

**ASHRAE also supports the provisions of S.720 that would require DOE to provide assistance, as requested, in developing definitions of energy use intensity (EUI).**

ASHRAE firmly believes that you can’t manage what you don’t measure. Because common, widely accepted and validated definitions and metrics of building EUI do not currently exist, building owners, operators, and policymakers can’t effectively communicate goals, evaluate potential investments, and measure success since they effectively are not speaking the same language. Portman-Shaheen helps solve this problem.

#### **Stretch Codes and Standards**

**ASHRAE strongly supports the provisions of S.720 that would require DOE to provide technical and financial support for the development of stretch codes and advanced standards for commercial and residential buildings.** ASHRAE is active in this area, and is currently making it easier for the building industry and policymakers to implement and adopt green building codes and voluntary building rating programs by creating a first-of-its-kind comprehensive framework involving ANSI/ASHRAE/USGBC/IES 189.1 Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential

---

<sup>5</sup> Stellberg, S. 2013. *Assessment of Energy Efficiency Achievable from Improved Compliance with U.S. Building Energy Codes: 2013 – 2030*. Washington, D.C.: Institute for Market Transformation.  
[http://www.imt.org/uploads/resources/files/IMT\\_Report\\_Code\\_Compliance\\_Savings\\_Potential\\_FINAL\\_2013-5-2.pdf](http://www.imt.org/uploads/resources/files/IMT_Report_Code_Compliance_Savings_Potential_FINAL_2013-5-2.pdf)

Buildings, the International Green Construction Code, and the Leadership in Energy & Environmental Design (LEED) program.

ASHRAE has also joined with ICC and the National Association of Home Builders to develop the 2015 edition of ICC 700 National Green Building Standard (NGBS). NGBS is an ANSI-approved standard, meaning that it adheres to rigorous consensus process requirements. NGBS addresses several green practices, including:

- Lot design, preparation and development
- Resource, energy, and water efficiency
- Indoor environmental quality
- Operation, maintenance, and building owner education

There are four achievable levels to NGBS: Bronze, Silver, Gold, and Emerald. Additional information on the NGBS can be found at [www.homeinnovation.com/green](http://www.homeinnovation.com/green).

### Net Zero Energy Buildings

**In a related area, ASHRAE supports the provisions of Portman-Shaheen related to net zero energy buildings.** As articulated in ASHRAE's *Vision 2020* report<sup>6</sup>, we support a goal for the building community to produce market-viable net zero energy buildings by 2030. The Energy Savings and Industrial Competitiveness Act can help the community come closer to reaching this goal through the bill's requirement for DOE to conduct a study on the feasibility, economics, and impacts of code improvements that would require that buildings be designed, sited, and constructed in a manner that enables buildings to become zero-net-energy after initial construction as advances are achieved in energy efficiency technologies.

### Workforce Training and Certification

**ASHRAE supports Subtitle B – Worker Training and Capacity Building of S.720.** The full benefits of energy efficiency cannot be realized if those that work in the building industry do not possess the skills research and experience have proven are needed. The proposed building training and assessment centers will help close this gap, however more needs to be done. **ASHRAE recommends including a stronger emphasis on certification programs that benchmark with the ANSI/ISO accreditation standards for personnel certification programs for building professionals in energy efficiency legislation. This will help ensure quality in workforce training and certification.**

Research has shown that building professionals who participate in training and obtain certifications yield buildings that are designed and perform at higher levels. Certification programs also provide significant benefits to building owners, including<sup>7</sup>:

<sup>6</sup> ASHRAE. *Vision 2020: Providing Tools by 2020 that Enable the Building Community to Produce Market-Viable NZEBs by 2030*. January 2008.

[http://www.ashrae.org/File%20Library/docLib/Public/20080226\\_ashraevision2020.pdf](http://www.ashrae.org/File%20Library/docLib/Public/20080226_ashraevision2020.pdf)

<sup>7</sup> ASHRAE. "The Value of Certification". <https://www.ashrae.org/education--certification/certification/value-of-certification>

- Increased confidence in critical job knowledge, skills and abilities
- Compliance with applicable local, state and federal requirements
- Confidence in corporate commitment to the professional development of its employees and to providing the best possible resources for projects
- Disciplinary process to follow in case of complaints

ASHRAE is active in meeting the needs of the building industry for a highly-educated workforce, and has developed and maintains six professional certifications in the following areas<sup>8</sup>:

- Building Energy Assessment
- Building Energy Modeling
- Commissioning Process Management
- Healthcare Facility Design
- High-Performance Building Design
- Operations and Performance Management

Currently, ASHRAE has certified more than 2,000 professionals who have demonstrated their knowledge and expertise in the heating, ventilating, air conditioning and refrigeration industry. These certifications are recognized by the federal government and several states and cities who use ASHRAE Certifications for energy audits, energy modeling, commissioning, and other services. These states and cities include<sup>9</sup>:

- |               |                       |
|---------------|-----------------------|
| • California  | • Boston, MA          |
| • Connecticut | • Chicago, IL         |
| • Florida     | • Fort Collins, CO    |
| • Maryland    | • Los Angeles County  |
| • Michigan    | • Lowell, MA          |
| • New York    | • Miami/South Florida |
| • Texas       | • New York City       |
| • Virginia    | • Sacramento, CA      |
| • Austin, TX  | • San Francisco, CA   |

### School Buildings

**ASHRAE supports the whole of S.523 and Subtitle C – School Buildings of S.720, which is drawn from S.523.** This legislation would help meet the widespread need throughout the nation for extensive repair of school buildings that affects some 14 million students<sup>10</sup>. Many of these repairs involve the heating, ventilating, and air conditioning systems – the same systems responsible for both large amounts of

<sup>8</sup> Additional information on ASHRAE's professional certifications can be found at <https://www.ashrae.org/education--certification/certification>

<sup>9</sup> Additional information on government recognition of ASHRAE's certifications is available at <https://www.ashrae.org/education--certification/certification/government-recognition>

<sup>10</sup> U.S. General Accounting Office. "Condition of America's Schools". February 1995. <http://www.gao.gov/products/HEHS-95-61>.

energy consumption and the maintenance of healthy and comfortable indoor environments. By upgrading these systems, energy efficiency is increased, learning environments are improved, and scarce funds are conserved.

#### **Energy Efficiency and Indoor Environmental Quality**

Research has confirmed that poor indoor air/environmental quality (IEQ) can result in serious health consequences, such as heart disease and lung cancer. As noted in the section above, the systems responsible for good or poor IEQ are the same systems that consume large amounts of energy in buildings. **In recognition of this link, ASHRAE opposes any efforts to increase energy efficiency at the expense of IEQ, and instead encourages Congress to support legislation that takes a more comprehensive approach to improving building performance.**

#### **Data Center Energy Efficiency**

Among the hottest trending topics in the building community is how to improve data center energy efficiency. **ASHRAE is currently focused on this subject, and supports the provisions of Sec. 301 Energy-Efficient and Energy-Savings Information Technologies of S.720, as they would help increase federal data center energy efficiency. We believe this section can be improved by adding specific provisions that would promote the future use of consensus-based standards on data center energy efficiency. ASHRAE is currently working with public and private stakeholders to develop Standard 90.4 Energy Standard for Data Centers and Telecommunications Buildings; adding a provision on standards for energy efficient data centers would assist federal agencies who voluntarily choose to use Standard 90.4, or other standards when they become available.**

Similar to Sec. 301 of S.720, the recently introduced S.1039 has the potential to improve data center efficiency, as it would require federal agencies to conduct assessments of data centers and develop consolidation and optimization plans to achieve energy cost savings. While the text of S.1039 is not yet available, ASHRAE looks forward to working with the bill's sponsor and the Senate Energy and Natural Resources Committee to explore these issues in greater depth.

#### **Valuing Energy Efficiency in Mortgage Underwriting**

Residential energy efficiency improvements have long-term benefits, but the initial upfront costs can be a deterrent to homeowners. At the same time, average yearly energy costs for homeowners can exceed the amount paid in real estate taxes or homeowners insurance, yet monthly energy bills are often ignored when determining a homeowner's ability to afford monthly mortgage payments.

This situation can be changed by including energy efficiency improvements in mortgage underwriting. Doing so will provide a more complete picture of the full costs of homeownership, while clarifying the value of investing in energy efficiency.

**ASHRAE strongly supports the provisions of S.720 that would allow federal mortgage loan agencies to include energy cost-savings when determining a borrower's ability to afford monthly mortgage payments.**

### State Energy Program and Weatherization Assistance Program

The U.S. State Energy Program (SEP) is the only program administered by DOE that provides direct, cost-shared resources to states. Research has shown that each dollar of SEP funds typically leverages nearly \$11 dollars of state and private funds, resulting in energy cost-savings of approximately \$7<sup>11</sup>.

Additionally, the most comprehensive evaluation of the Program to date, conducted by the Oak Ridge National Laboratory<sup>12</sup>, revealed that in a single year, SEP demonstrated extraordinary value, leading to:

- Over 15,000 energy audits of residential, commercial, and industrial buildings
- Energy efficiency retrofits for nearly 13,000 buildings
- The education of approximately 600,000 students on energy efficiency

The Weatherization Assistance Program (WEP) provides grants to states, territories, and Indian tribes to improve the energy efficiency of the homes of low-income homeowners. Since the Program's inception 39 years ago, it has helped reduce the energy bills of more than 7 million low-income families.

**For these reasons, ASHRAE strongly supports the Weatherization Enhancement and Local Energy Efficiency Improvement and Accountability Act (S.703).**

### Utility Energy Service Contracts and Energy Savings Performance Contracts

**ASHRAE supports bills such as S.858 and S.723, which would facilitate the increased use by federal agencies of utility energy service contracts (UESCs) and energy savings performance contracts (ESPCs).** UESCs and ESPCs are a means of catalyzing the implementation of energy efficiency, water savings, and renewable energy projects with guaranteed results at federal agencies at no cost to taxpayers, and should thus be encouraged.

### Supporting Innovation in the Built Environment

**ASHRAE supports legislation such as S.886, the Smart Energy and Water Efficiency Act of 2015, which promotes innovative approaches to increasing energy and water efficiency.**

### Next Steps for Energy Efficiency Legislation That Helps Solve Pressing Challenges

As the Committee moves forward in its consideration of energy efficiency legislation, allow me to offer ASHRAE up as a resource. Throughout its 121 year history, ASHRAE and its members have answered the call to develop solutions for the world's energy and indoor air quality problems. In-so-doing, we have amassed deep and broad technical expertise in the built environment. ASHRAE has been involved with the development and promotion of many of the bills being discussed by the Committee today, and I encourage the Committee to continue seeking our input as these bills move forward, with the goal of

<sup>11</sup> National Association of State Energy Officials. "U.S. State Energy Program". <http://www.naseo.org/state-energy-program>.

<sup>12</sup> Oak Ridge National Laboratory. "An Evaluation of State Energy Program Accomplishments: 2002 Program Year". June 2005. [http://www.naseo.org/Data/Sites/1/documents/SEP/SEP\\_Study\\_ORNL.pdf](http://www.naseo.org/Data/Sites/1/documents/SEP/SEP_Study_ORNL.pdf)

enacting historic legislation that truly helps meet the pressing energy and environmental needs of our day.

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas H. Phoenix". The signature is written in a cursive style with a prominent initial "T" and a long, sweeping underline.

Thomas H. Phoenix  
ASHRAE Society President

## Appendix: An In-depth Look at ASHRAE Standard 90.1

ANSI/ASHRAE/IES 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings has been the basis for federal, state, and local commercial building energy codes since the 1970s, and is required in numerous laws and Executive Orders, including the Energy Independence and Security Act, Energy Conservation and Production Act, Energy Policy Act of 2005, National Technology Transfer and Advancement Act of 1995, and OMB Circular A-119.

Standard 90.1 is an American National Standards Institute (ANSI) approved standard, which means that its development adheres to rigorous principles of consensus, openness, balance, transparency, and due process. In fact, ASHRAE is one of the very few ANSI Audited Designators which means we have established and maintain a consistent record of successful voluntary standards development.

The Standard is developed by a committee made up of technical experts representing diverse aspects of the building community, including product manufacturers, energy efficiency advocates, academics, government, building owners, utilities, and consulting (or design) engineers and architects. After the committee reaches consensus on a draft of the standard it is open for a period of public comment. There are no restrictions on who may offer comments, and no one commenter is given greater standing than another. Once comments are received, the committee must attempt to resolve all comments before presenting the standard to the ASHRAE Board of Directors for publication. Both within the ASHRAE and ANSI structures there are opportunities for appeal for anyone who feels that their comments regarding the standard are not adequately addressed.

During the development of the Standard, the 90.1 committee evaluates the cost-effectiveness of individual addenda, as applicable, using a type of life-cycle cost (LCC) analysis called the Scalar Ratio Method. This method is based on ASTM Standard E917—Standard Practice for Measuring Life-Cycle Costs of Buildings and Building Systems. The Scalar Ratio Method simplifies the LCC model in ASTM Standard E917 into a single variable called the Scalar Ratio, which is simply a ratio of economic present worth factors. The Ratio is mathematically equivalent to a LCC analysis using the following parameters:

Parameter	Rate (percent)
Economic Life	Up to 40 years
Loan Interest Rate	6.25%
Heating Fuel Escalation Rate	3.76%
Cooling Fuel Escalation Rate	3.76%
Federal Tax Rate	34%
State Tax Rate	6.5%
Nominal Discount Rate	7%
Real Discount Rate	6.05%

For additional, in-depth information on Standard 90.1, please visit <http://sspc901.ashraepecs.org/>.



April 28, 2015

Senator Lisa Murkowski  
U.S. Senate  
Chair, Energy and Natural Resources Committee  
Washington, D.C. 20510

c/o Cathy Cahill  
[cathy\\_cahill@energy.senate.gov](mailto:cathy_cahill@energy.senate.gov)

Senator Maria Cantwell  
U.S. Senate  
Chair, Energy and Natural Resources Committee  
Washington, D.C. 20510

c/o Allen Stayman  
[allen\\_stayman@energy.senate.gov](mailto:allen_stayman@energy.senate.gov)

Dear Senator Murkowski and Senator Cantwell:

On behalf of the 240 members of the Association of Art Museum Directors (AAMD), their staff, their public and the Board of Trustees of the AAMD, we thank you for your consideration of S. 600 the "Energy Efficiency Legislation" and urge its passage as soon as possible.

Many of the energy efficiency incentive or support programs that have been in place the past several years have been structured in the form of tax credits and rebates. As nonprofits we have not been able to take advantage of these programs. S. 600 would give museums and other nonprofit institutions the opportunity to make our system more energy efficient and thereby allow us to reduce our energy costs.

Our museums, which are located all across America, often in older buildings, have utility costs that run in the multiple hundreds of thousands of dollars. Any savings that can be affected from these costs will go directly to programs that help preserve the collections and educate the public.

Again, we thank you for your efforts in this important piece of legislation and look forward to sharing with our museums that relief of energy costs is on its way.

Sincerely,

A handwritten signature in cursive script that reads "Christine Anagnos".

Christine Anagnos  
Executive Director  
Association of Art Museum Directors



1111 19th Street NW • Suite 402 • Washington, DC 20036  
 t 202.872.6955 / 202.872.9354 www.aham.org

**Statement for the Record**

**Robert D. McArver**  
**Vice President, Policy & Government Relations**  
**Association of Home Appliance Manufacturers**

**Committee on Energy and Natural Resources**  
**United States Senate**

**Hearing on Proposed Energy Efficiency Legislation**  
**April 30, 2015**

The Association of Home Appliance Manufacturers (AHAM) appreciates the opportunity to submit this testimony regarding certain issues and legislation considered at the Committee's hearing on April 30 on energy efficiency and related topics. AHAM represents manufacturers of major, portable and floor care home appliances, and suppliers to the industry. AHAM's more than 150 members employ tens of thousands of people in the U.S. and produce more than 95% of the household appliances shipped for sale domestically. The factory shipment value of these products is more than \$30 billion annually. The home appliance industry, through its products and innovation, is essential to U.S. consumer lifestyle, health, safety and convenience. Through its technology, employees and productivity, the industry contributes significantly to U.S. jobs and economic security. Home appliances also are a success story in terms of energy efficiency and environmental protection. New appliances often represent the most effective choice a consumer can make to reduce home energy use and costs.

AHAM has been and remains a supporter of the federal appliance standards program and the Environmental Protection Agency's (EPA) Clean Air Act Title VI Stratospheric Protection program. In addition, our members are original and longtime ENERGY STAR participants. Indeed, AHAM enhanced and created a verification system to provide an effective and efficient means to ensure product compliance with ENERGY STAR qualification criteria.

Unfortunately, we have seen all three of these federal programs lose their proper focus, and we believe they need to be revamped to take into account current economic and technological realities. Our support of the legislation below would not result in the end of these programs, but would instead improve and properly rebalance them.

**DOE Rulemaking**

As background, the appliance standards program developed in essentially today's form in the late 1980s. It initially evidenced a careful and reasonable balance between national and consumer interests in more efficient appliances and other consumer products, state preemption of energy

and water standards, the need to protect product functionality and utility, and the imperative not to impair U.S. industry and manufacturing capability. After 30-some years, all of the core major appliances have been subject to multiple rulemakings and as many as four separate energy efficiency standards. Nonetheless, the current law mechanically requires regular new rulemakings with a presumption that a new, revised standard will be set, regardless of whether there is any need or technical justification.

At the same time, DOE seeks to find new consumer products to regulate, which often requires questionable legal machinations to place dissimilar products in the same product category to meet the statutory minimum amount of energy that will be saved through standards. Making matters worse, the analyses used by DOE's consultants are increasingly deficient in detail and transparency. Such analyses are difficult to understand or analyze for all but the consultants who develop them. Greatly exacerbating this problem is that the Department—for no apparent reason other than political expediency—has unilaterally decided in some cases to eliminate or shorten the stakeholder consultation that used to precede publication of a proposed rule. This step was originally adopted as a key component of the Department's own Process Improvement guidance. As a consequence, stakeholders now often are confronted with flawed proposed efficiency standards for which they have neither provided data nor substantive input.

Finally, DOE makes a fundamental mistake in developing in parallel both test procedures and the standards that are dependent on the final test procedure. It is impossible for the Department, its consultants or interested stakeholders to fully appreciate the significance of test procedure revisions and fully evaluate proposed standards under these circumstances. This is no way to develop a regulation, and it reflects a breakdown in what was once a constructive and even collaborative process. The opportunity to provide meaningful stakeholder comments is impaired when parties do not know how they are to test against a proposed new standard. To the contrary, this is textbook arbitrary and capricious behavior likely to result in standards that do not meet the substantial evidence standard required by the Administrative Procedures Act.

Although DOE seems unwilling to remediate these problems, there are straightforward fixes available to Congress that do not destroy the program or the process but instead focus the former and improve the latter.

#### **ENERGY STAR**

With respect to ENERGY STAR, this program, ironically, is suffering from its great success. It has moved from a program highlighting a few, very high-end products to one that is now required for all manner of federal, state and local government contracting, taxpayer-supported housing, and—most significantly for appliances—by retailers. This effectively converts the voluntary ENERGY STAR program into a mandatory requirement for manufacturers. Beyond this transformation of its significance to the market, ENERGY STAR is now seeking to set new qualification levels that are extremely costly to meet and result in only limited amounts of energy savings to consumers. Tacked on to these ever more stringent and marginally economic payback levels are product performance requirements unrelated to energy usage and thus outside the scope of the program.

On top of these stringent new specification levels and limited efficiency benefits, a new form of pernicious class action lawsuit has developed, piggybacking off of appropriate EPA and DOE programs that protect consumers by ensuring ongoing compliance with ENERGY STAR. The government must maintain the fairness and credibility of ENERGY STAR, but when it has made a determination whether or not remedial action is required by participants whose products have fallen out of compliance with program requirements, there is no need to let private parties pile on with frivolous litigation. The type of “sue and settle” lawsuits that have emerged since EPA began posting a disqualified product list in 2010 do not provide any additional protections to consumers and actually threaten the integrity of the ENERGY STAR program by providing a disincentive for continuing broad participation by manufacturers.

Finally, it is past time for ENERGY STAR to be recognized as having de facto regulatory impact therefore requiring that it meet the minimum procedural and substantive mandates of the Administrative Procedure Act as do thousands of other federal regulatory programs.

#### **EPA’s SNAP Program**

Finally, there is a related issue with respect to EPA’s Significant New Alternatives Policy (SNAP) Program under title VI of the Clean Air Act. This program regulates substitutes for ozone depleting substances, but EPA is now using it to pursue climate-related regulatory objectives that are beyond the scope of its SNAP authority. A current rulemaking to change the status of (i.e., de-list) certain substances previously approved under the SNAP program raises fundamental questions as to whether EPA even has authority over second or third generation substitutes where new refrigerants are not being used to substitute for ozone depleting substances.

In this rulemaking, EPA proposed dates for the phase-out of hydrofluorocarbons (HFCs) that are far too accelerated and—for the purpose of the Committee’s jurisdiction—do not take into account the impact the proposed phase-out would have on industry’s ability to comply with existing DOE appliance efficiency standards. Certain HFCs—whether as refrigerant gasses or in foam insulation—are critical to maintaining and enhancing the energy efficiency of refrigerators. The research, design, investment and testing throughout the supply chain that are required to comply with new energy standards and for a change-out of these products are among the highest investments any company will make in its product line. Any rulemaking activity at EPA or DOE, therefore, should take into account the other agency’s actions so that analysis by either agency will be well-founded and coordinated to minimize multiple investments, stranded equipment and cumulative regulatory burden.

In the current SNAP rulemaking, this has not been the case, and it could result in significant costs and disruption to manufacturers. Notably, the appliance industry is already well on its way to phasing out the use of HFCs in the relevant application, so EPA’s accelerated phase-out not only fails to reflect the impact and timing of DOE’s next refrigerator efficiency standard, it is also disconnected from the realities of where industry is headed voluntarily.

#### **Legislative Fixes**

In light of the concerns expressed above, our industry supports revisions to the current energy law that would require:

- test procedures to be finalized before standards are proposed
- pre-proposal stakeholder engagement according to a defined process
- transparency in the models and analyses DOE and its contractors use
- accounting for cumulative regulatory burden
- avoiding unnecessary rulemakings when multiple standards already have been put in place
- applying to ENERGY STAR the protections of the Administrative Procedure Act, and
- prohibiting ENERGY STAR from establishing non-energy-related performance requirements for covered products.

We specifically support S. 1038, the Energy Star Program Integrity Act, which would preempt state causes of action or noncompliance under ENERGY STAR where EPA has evaluated and determined whether and what remedial action is required. We also support S. 1047, which would require the Secretary of Energy to review rulemaking proceedings of other federal agencies for the potential to cause an adverse effect on the cost, timing or difficulty of complying with energy efficiency regulations.

#### **Conclusion**

We emphasize again that these legislative concepts and bills would greatly improve DOE and EPA programs, not eliminate them. It is time to rethink the regulatory models for appliance efficiency standards, ENERGY STAR and EPA's SNAP program to ensure that processes are fact-based, open and rational.

AHAM thanks the Committee for the opportunity to provide this testimony and of course would be glad to discuss our position.

May 5, 2015

Hon. Lisa Murkowski, Chairman  
Hon. Maria Cantwell, Ranking Member

Dear Chairman Murkowski and Ranking Member Cantwell,

Big Ass Solutions is a designer and manufacturer of ceiling fans and lighting products headquartered in Lexington, Kentucky. Big Ass Solutions has some of the most efficient fan designs in the world and operates a world-class research and development facility right in Kentucky that helps keep American products a cut above their competitors in Asia. We support the Committee's hard work this Congress to advance productive, bipartisan legislation to grow energy savings in private and federal buildings.

With all due respect to Senator Alexander, we oppose his bill S. 1048. This bill would eliminate funding for the U.S. Department of Energy to continue work on a proposed rule to establish new energy conservation standards for Residential Ceiling Fans and Ceiling Fan Light Kits. We support DOE's efforts to continue the rulemaking process that will help save consumers money, streamline operations for industry, and enhance the market for products Made in the USA.

There are several reasons why we do not support this bill. First, the true cost impacts of the eventual final rule are currently unknown and have not been projected by the Department of Energy. This rulemaking process began in 2011. Proponents of S. 1048 claim this rule will create undue financial burden that could drastically increase the price of the fan. But a doubling in price on retail products would be a completely unprecedented event among DOE energy conservation standards. DOE is required to conduct a rigorous cost/benefit analysis of any proposal they put forward. And to date, DOE has not yet made any formal projection as to what the additional compliance on manufacturers (and impacts on fan costs) will be. DOE should be allowed to issue a draft proposal and establish more of the facts before Congress takes any action.

Second, fan manufacturers asked for this rulemaking to ensure consistency across the entire United States market. Nearly a decade ago, three states (California, Maryland and New York) created their own unique standards for ceiling fan test procedures and performance. In response, U.S. fan manufacturing industry asked the federal government for a national standard to make industry compliance simpler and more consistent and cost effective.

Third, a federal rule helps products made in the United States. Minimum performance standards will help solidify the market share of superior American-made products. Better performing U.S. made products will maintain a market advantage over lesser quality foreign products.

Fourth, a federal rule is good for consumers. A federal standard will help consumers save real money on their utility bills. Preliminary DOE analysis indicates that an enacted rule could

save one to three quads of energy over time. We believe that the rulemaking will have a minimal impact on the prices consumers pay for ceiling fans up front, but will save consumers far more money over time by consuming less energy. This can be achieved without affecting the appearance and user experience of the fan. A federal rule will not result in limits to consumer choice and will only encourage manufacturers to innovate and improve their products.

We believe that the Department of Energy should be afforded the opportunity to issue its draft rules so that industry and other stakeholders can decide then, with sufficient information about the potential costs and benefits, how to proceed. The rulemaking process requires that DOE offer an ample comment period before any rule is made final, and we intend to make full use of that opportunity when it is made available. S. 1048 sets a bad precedent of preempting the federal rulemaking process before any positive or negative implications are even apparent.

Thank you for your consideration. We look forward to working with the Committee on this issue.

Sincerely,

Carey Smith  
Big Ass Solutions



April 24, 2015

Honorable Lisa Murkowski, Chairman  
Energy & Natural Resources Committee  
United States Senate  
304 Dirksen Senate Building  
Washington, DC 20510

Honorable Maria Cantwell, Ranking Member  
Energy & Natural Resources Committee  
United States Senate  
304 Dirksen Senate Building  
Washington, DC 20510

Dear Senators Murkowski and Cantwell:

Bristol Bay Native Corporation (BBNC) and its subsidiary CCI Group LLC (CCI) write in support of your bipartisan efforts to draft new energy legislation. We hope your efforts will include measures to specifically authorize up to a 25-year payback period for Utility Energy Services Contracts (UESCs). Alternatively, we support the stand-alone legislation that was introduced as S. 723 by Senators Schatz, Alexander, Coats and Coons to amend the National Energy Conservation Policy Act and similarly authorize UESCs with 25-year payback periods. Both efforts provide a means of promoting federal energy efficiency and leveling the playing field between the UESC and Energy Savings Performance Contracts (ESPCs) programs which compete for the same federal energy efficiency dollars. We also support the stand-alone legislation sponsored by Senators Gardner, Coons, Portman and Shaheen entitled the "Energy Savings Through Public-Private Partnerships Act of 2015" and numbered as S. 858. This legislation more generally promotes the federal government's use of both UESCs and ESPCs to promote energy efficiency and reduce federal energy costs. We urge your Committee to act on and report favorably on these measures.

#### DESCRIPTION OF NEED

As the largest consumer of energy in the United States, the federal government and its agencies are expected to comply with stringent energy efficiency and conservation targets, as established via executive orders and legislative mandates. In December 2011, President Obama issued the *Implementation of Energy Savings Projects and Performance-Based Contracting for Energy Savings* memorandum, stipulating that "[t]he Federal Government shall enter into a minimum of \$2 billion in performance-based contracts in Federal building energy efficiency within 24 months," by leveraging both UESC and ESPC programs. As the two-year time frame for this mandate drew to a close, a broad coalition of Senators and Representatives wrote to the President to encourage him to extend the initiative with more ambitious federal government spending goals for UESC and ESPC projects over a new five-year period. President Obama responded in May 2014 by announcing an additional \$2 billion goal in UESC and ESPC funded federal energy efficiency upgrades over the ensuing three years. With this broad support in hand, the federal government is poised to achieve billions of dollars in energy efficiency

upgrades to its facilities over the next few years. The challenge is to ensure the federal government has the necessary funding tools it needs to achieve these goals.

The above legislation will ensure the federal government can fully and fairly utilize both the UESC and ESPC programs. Authorized by the Energy Policy Act of 1992 (42 U.S.C. § 8256), UESCs are limited-source contracts between a federal agency and its utility for energy management services including energy and water efficiency improvements and demand-reduction services. The contracts can be entered into between any utility company (electric, gas, water, etc.) and any federal agency. The utilities subcontract with an energy services company (ESCO) to perform the UESC project and recoup the costs from the energy and water cost savings achieved through the improvements. There are no restrictions on the energy services companies that can participate in UESC projects. In fact, the 16 pre-qualified ESPC contract holders that are the only companies that can complete for ESPC funded projects can also use the UESC contracting vehicle.

Both the General Services Administration (GSA) (which manages more than 9,600 federal properties) and the Department of Energy's Federal Energy Management Program (FEMP) (which oversees the UESC program) interpret the Energy Policy Act of 1992 to permit UESCs to have longer than 10-year payback terms. Problematically, many federal agencies, including the Department of Defense, restrict UESCs to 10-years, thereby limiting the scope and effectiveness of this energy efficiency contracting mechanism.

Due to the 10-year payback period limitation, projects funded through the UESC program are typically small, ranging in size from \$1 million - \$10 million in total costs. In contrast, ESPCs, that utilize a 25-year payback term, are typically used to fund larger projects, ranging in size from \$10 - \$100 million in total costs. This has created a disparity between the allocation of UESCs and ESPCs with the preponderance of the awards being made to the same large businesses.

More problematically for federal installations, the 10-year payback limitation on UESCs means more ambitious energy performance measures, including projects that would incorporate renewable energy solutions, cannot be funded through a UESC. According to FEMP, UESCs and ESPCs are a great deal for the federal government – federal facilities get much needed improvements without any federal appropriation needed to cover the upfront costs. FEMP also reports that the average improvement project has a cost of approximately \$15 million and a payback period of 17 years.<sup>1</sup> Thus, the average project cannot be funded through a UESC and limits the ability of federal installations to make energy efficiency improvements.

---

<sup>1</sup> <http://www.federaltimes.com/story/government/interview/program-view/2014/12/02/unruh-energy-saving-program-on-track-toward-ambitious-goals/19793885/> (accessed April 15, 2015).

RELEVANCE TO CCI

The primary focus of CCI is operating in the energy conservation market space. CCI employees are subject matter experts with respect to UESC and over their careers have developed and executed over \$100 million worth of energy conservation project work for customers covering the eastern United States.

While CCI actively markets both UESC and ESPC services to customers through UESC contracts with utilities and via subcontracts for the ESPC-qualified contact holders, CCI prefers working on UESCs with its utility partners rather than working as a subcontractor to one of the large 16 pre-qualified contract holders on ESPC projects. CCI believes that UESCs are a better value for the government and that its utility partners more highly value their relationship with CCI than do the ESPC contractors. The formal recognition of a 25-year UESC project payback term will allow CCI, and other energy services companies, to perform larger projects and more effectively assist the Government with reaching its energy conservation goals.

As a point of reference, CCI completed a \$3.3 million UESC project at Submarine Base New London in Connecticut under our relationship with Groton Utilities. If the project window, which was limited to 10 years, had been 25 years, CCI could have made a more significant reduction in the Base's utility cost and performed a project upwards of \$9 million. As it was, only more modest energy reductions were achieved and the federal government and taxpayers lost out. The various legislative measures currently being considered by your Committee would redress this problem.

CONCLUSION

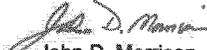
Creating parity between the UESC and ESPC programs will ensure that government agencies have the ability to utilize the best value program for their energy conservation and renewable energy projects. Additionally, reasserting that UESC projects can have payback periods of up to 25 years will help ensure that the large ESPC contractors do not monopolize execution of all significant energy projects.

Thank you again for your continued work to improve our nation's energy policies and to enact legislation that will lead to greater the utilization of beneficial public-private energy partnerships. We support your bipartisan efforts to enact new energy policy and to consider the stand-alone legislation in S. 723 and S. 858 that has been referred to your Committee.

Sincerely,



Jason Metrokin  
Bristol Bay Native Corporation  
President and CEO



John D. Morrison  
CCI Group LLC  
President and CEO

**Business Council for Sustainable Energy**  
**Testimony Submitted to the Senate Energy and Natural Resources Committee**  
**Hearing on Energy Efficiency**  
**April 30, 2015**

The Business Council for Sustainable Energy appreciates and welcomes the committee's consideration of policy measures to improve and enhance energy efficiency.

The Council is a broad-based industry trade group representing companies and associations in the energy efficiency, natural gas and renewable energy industries. Its membership includes independent electric power producers, investor-owned utilities, public power, commercial end-users, equipment manufacturers, project developers as well as service providers for energy and environmental markets. Since 1992, the Council has been a leading industry voice advocating for policies at the state, national and international levels that increase the use of commercially-available clean energy technologies, products and services.

The Council would like to share some of the findings from the 2015 edition of the *Sustainable Energy in America Factbook*.<sup>1</sup> The *Factbook* was researched and produced by Bloomberg New Energy Finance and commissioned by the Business Council for Sustainable Energy. It is a quantitative and objective report, intended to be a resource for policymakers with up to date, accurate market information. Its goal is to offer important benchmarks on the contributions that sustainable energy technologies are making in the United States energy system today. It also provides information on finance and investment trends in clean energy resources.

***Sustainable Energy in America Factbook Findings***

The *Sustainable Energy in America Factbook* points to the dramatic changes underway in the United States energy sector over the past several years. Traditional energy sources are declining, while natural gas, renewable energy, and energy efficiency are playing a larger role.

These changes are increasing the diversity of the country's energy mix, improving our energy security, cutting energy waste, increasing our energy productivity and reducing air pollution and greenhouse gas emissions.

Behind this change are a portfolio of new energy innovations, technologies, and applications. These include: newly applied techniques for extracting natural gas from shale rock formations; lower-cost and higher-efficiency photovoltaic panels for converting sunlight to electrons; highly efficient, natural gas end-use applications; natural gas vehicles and battery and fuel cell electric vehicles; and 'smart meters' that allow consumers to monitor, modulate, and cut electricity consumption, among others.

The *Factbook* looks at a broad spectrum of sustainable energy technologies and provides data on a wide range of clean energy industries including natural gas, renewable energy sources (including solar, wind, hydropower, geothermal, biomass, biogas and waste to energy – but excluding liquid biofuels), stationary fuel cells and other distributed technologies, as well as energy efficiency.

The *Factbook* shows that United States economy is becoming more energy productive and less energy intensive. By one measure—United States gross domestic product (GDP) per unit of energy consumed—productivity has increased by 54% since 1990. Between 2007 and 2014, total energy use fell 2.4%, while GDP grew 8%. This was driven largely by advances in energy efficiency in the transportation, power generation and buildings sectors.

---

<sup>1</sup> 2015 edition of the *Sustainable Energy in America 2013 Factbook*, February 2015, <http://www.bcse.org/sustainableenergyfactbook>

## BETWEEN 2007 AND 2014:

- Total energy use fell 2.4%, while GDP grew 8%.
- Energy productivity of the U.S. economy has increased 11%, and 1.4% from 2013 to 2014.
- Annualized electricity demand growth has been zero.

## ENERGY EFFICIENCY TRENDS

- Energy efficiency investment in the U.S. totaled close to 14 billion in 2013, based on spending by utilities and through energy savings performance contracts.
- In 2014, buildings in 10 states adopted more-stringent residential and commercial building codes.
- In 2014, 8% of U.S. generating capacity comes from combined heat and power (CHP) plants (83 GW).
- Commercial and industrial sector appetite for CHP remained the same, approximately 700 MW per year since 2009.
- Smart meters have been deployed to 39% of electricity customers.
- Investments into transmission and distribution infrastructure totaled a record-high \$37.7 billion in 2013 (by investor-owned utilities and standalone transmission companies).
- Demand response accounts for 34 GW of capacity across the U.S.
- The Pacific and New England regions made the greatest strides in energy efficiency. The southeast and southwest regions, meanwhile, have the greatest opportunities to increase efficiency.
- As a trend across the U.S., commercial buildings have showed the greatest progress on energy efficiency over the last several years.
- Uptake of key energy efficiency policies is slowing. States' adoption of decoupling legislation and energy efficiency resource standards (EERS) has been mostly flat since 2010 (with some exceptions), and some states have even begun to retreat from these policies.
- Tightening fuel economy standards are pushing carmakers to release more efficient vehicles; these standards will demand a doubling in fuel economy by 2025.
- Gasoline consumption is down by 8.6% since 2005, largely due to increasing vehicle efficiency prompted by federal policy, increasing consumer preference for less thirsty vehicles on the road, declining miles per vehicle), and increased biofuels blending.
- Sales of battery and plug-in hybrid electric vehicles increased 25% (through 2014 Q3), comprising just less than 1% of market share for new vehicle sales.
- The commercial and industrial sector is demonstrating a continued appetite for CHP (about 700 megawatts (MW) per year since 2009) as well as interest in microgrids.

While energy demand has fallen more steeply than it has in at least 50 years, the use of natural gas and renewable energy has increased. Natural gas provided the United States with 28% of its total energy supply in 2014, and renewable energy is supplying 9.7% of U.S. energy. Natural gas-fired power plants provided 27% of U.S. electricity in 2014, up from just 22% in 2007. Renewable energy generation has meanwhile grown from 8.3% to 12.9% between 2007 and 2014.

**Regional Energy Efficiency Comparisons**

The regions seeing the greatest measurable strides in energy efficiency are New England and the Pacific states; and the buildings seeing the most energy efficiency efforts are commercial structures. In contrast, the regions that offer the greatest untapped opportunities are the Southeast and Southwest of the country, and the building types that present new opportunities include small office buildings, warehouses, and storage facilities. This comparison of leaders and laggards is based on metrics presented in the *Factbook*, such as: state-wide utility efficiency savings as a percentage of retail sales, state-by-state scorecards for energy efficiency policies, Energy Star-certified floor space for different types of buildings, and investment flows by type of framework. Energy efficiency investment in the U.S. through formal frameworks (mostly, investments by utilities and investments under energy savings performance contracts) totaled an

estimated \$14bn in 2013. Advances in technology and policies to increase the efficiency of appliances and buildings have played a role in reducing emissions and increasing the economy's energy productivity. On the policy front, for example, through 2014, 6.0bn square feet of commercial floor space (around 7% of total US commercial sector floor space) was covered under energy efficiency benchmarking or disclosure policies.

***Energy Efficiency Policy Measures Provide Exceptional Value for American Consumers***

Policy measures have helped further the cause of energy efficiency. The Department of Energy's efficiency programs have resulted in exceptional value for American consumers and businesses, yielding benefits far beyond their nominal outlays. These programs have retrofitted over 450,000 homes in 43 states, dramatically improved the efficiency of household appliances such as refrigerators and clothes washers, and improved the quality of commercial and residential buildings across the country.<sup>2</sup>

On February 7, 2013, the Commission on National Energy Efficiency Policy, convened by the Alliance to Save Energy released at its Energy 2030 vision. The Commission's report includes a goal of doubling energy productivity in the United States by 2030 and a set of recommendations to achieve this goal, which includes continued support of energy productivity RD&D. Achieving the goal could save \$327 billion annually and add 1.3 million jobs.<sup>3</sup>

The Commission noted that private R&D budgets are limited in many energy efficiency sectors. Market barriers also prevent adoption and commercialization of new innovations. Thus government support both for R&D and for a wide range of deployment programs has been critical to advances in energy productivity. Looking forward, the Commission recommends increased federal investment in basic and applied research, development, demonstration, deployment, and technical assistance at DOE, the Environmental Protection Agency, and other federal agencies. The federal government should also encourage private R&D through other policy approaches such as public-private consortia, the R&D tax credit, and supporting challenges or contests.

Building envelope assemblies including, insulating materials and air-sealing system technologies are essential to improving building efficiency. To enable mass market adoption, these next-generation technologies must maintain or improve building enclosure durability, including moisture, fire, indoor air quality, acoustic and structural performance requirements. In the case of retrofitting existing buildings, the installation must be fast and easy so that there is minimal impact on building occupants. BCSE believes DOE should focus additional efforts to accelerate, and improve, building energy performance.

***Information and Communications Technology Infrastructure Enhances Energy Efficiency***

In an increasingly complex energy system, Information and Communications Technology (ICT) can be used to improve the reliability, resiliency and efficiency of the grid's transmission, storage and distribution infrastructure, and to help reduce pollutant emissions through better real time monitoring and control of grid systems. Further ICT applications to enhance end-use energy efficiency and facilitate demand response strengthen grid efficiency and reliability by reducing peak load stresses and line losses and by allowing better grid management in case of generation outages or transmission anomalies.

In the past, transmission, storage and delivery in the energy grid historically was a relatively straightforward, linear system of generation to transmission to distribution. Dispatching was generally local and based on marginal cost considerations. Margins of safety were large because of limited real-time information and limited options for replacement of power generation sources in an emergency.

<sup>2</sup> Alliance to Save Energy at <http://www.ase.org/advocacy/immediate-action-needed-defend-federal-energy-efficiency-programs>

<sup>3</sup> *Energy2030: Doubling U.S. Energy Productivity by 2030*, <http://ase.org/programs/ee-commission>

Today's grid must adapt to emerging challenges and opportunities – fluctuating energy prices, an increasingly transactive role for customers, integration of distributed energy resources, the need for improved resilience, and the need to reduce greenhouse gas emissions. In order to meet these challenges, a vastly increased role for ICT is essential. Without continually enhanced ICT in the TS&D infrastructure, the grid cannot achieve these 21st century goals. ICT will allow real-time monitoring of actual conditions throughout the system, and provide the ability to control TS&D system functions so as to maximize efficiencies and ensure reliability with less additional costly excess capacity.

Studies have shown grid-related investment in ICT provides enormous benefits for energy efficiency, economic growth and maximum use of non-polluting energy sources.

#### ***Energy Efficient Lighting Saves Taxpayers and Consumers Money***

Light emitting diode – or LED – bulbs use 75 percent less energy than the old incandescent light bulbs and last up to 25 years. Using LED bulbs on streets and highways, and in our homes, can save taxpayers and consumers a significant amount of money.

For example, LED bulbs, can cut a city's outdoor lighting bill by half or more. Given that most municipalities are strapped for funds, shifting to energy-saving LED light bulbs helps local governments cut operating expenses.

DOE has led the effort in the transformation to more efficient lighting through demonstration projects to validate the effectiveness of outdoor LED lights and to develop procurement guidelines for interested communities and businesses. LED lights are directional light sources so well-designed fixtures can point the light exactly where the light is needed, while also preventing light from going where it's not wanted, such as in the sky or a neighboring property.

Today, less than 5 percent of outdoor lighting fixtures use LEDs bulbs so the savings potential is significant. DOE has estimated that a total shift to LED outdoor lights would save more than \$6 billion and prevent 40 million metric tons of carbon dioxide emissions per year. The upfront cost for LED bulbs is quickly paid back and represents a great investment toward lower bills and reduced air pollution for years to come.<sup>4</sup>

#### ***The Role of Federal Facilities and Energy Saving Performance Contracts***

As the nation's single largest energy consumer, the Federal government spends more than \$7 billion annually on facility energy costs. Energy efficiency improvements can reduce this expenditure as well as help agencies acquire necessary infrastructure and equipment. In 2007, the Energy Independence and Security Act required federal agencies to perform energy audits of their facilities. With only half of the buildings audited in 2013, approximately \$9 billion worth of energy conservation measures with a ten year payback or less had been identified. There is clearly a vast opportunity for energy efficiency across the Federal government at a time of reduced discretionary funding.

ESPCs and Utility Energy Service Contracts (UESCs) can fill this funding gap. For over 20 years, performance-based contracts for energy savings have provided critical upgrades to federal buildings, including the House and Senate Office Buildings and the U.S. Capitol. Under ESPCs and UESCs, private-sector Energy Service Companies finance and install new energy efficient equipment at no upfront cost to the federal government. Federal agencies repay this investment over time with funds saved on utility costs.

In May 2014 President Obama issued a memorandum extending a target that had been set at the end of 2011 (\$2bn worth of contracts entered in the period 2012-13; target was extended to \$4bn over the period 2012-16).

<sup>4</sup> <http://energy.gov/eere/ssl/led-lighting-facts>

S. 858, the Energy Savings through Public-Private Partnerships Act, introduced by Senators Gardner, Coons, and Portman, would help ensure that federal agencies are utilizing to the fullest extent possible all cost-effective measures for energy conservation. Identical legislation has been introduced in the House (HR 1629) and was incorporated into the Energy and Commerce Committee's discussion draft of an energy efficiency title for its comprehensive energy bill. Last spring, the Energy Savings through Public-Private Partnerships Act of 2014 was approved by the Energy and Commerce Committee. BCSE encourages Congress to enact these provisions in the 114th Congress.

This legislation would promote transparency and accountability across the federal government, clarify the ESPC statute, and would further enable federal agencies to maximize their present energy efficiency contracting authorities. The legislation would streamline the ESPC statute providing consistency and clarification within the existing ESPC law to:

- Require a report to Congress on the status of each agencies' energy-related performance contracts, the value of these contracts for the previous year, the goal for the coming year, and an explanation by agency about why goals were or were not met.
- For projects discovered in the energy audits required by section 432 of EISA 2007, agencies must explain why any life cycle cost effective measures were not implemented using DOE developed guidelines. This will encourage agencies to act on their mandated audits.
- Clarify that agencies cannot arbitrarily limit use of energy-related operations and maintenance savings in an ESPC, a provision that will facilitate use of ESPCs for data center consolidation.
- Make consistent the definition of a federal building within federal energy provisions of law.
- Clarify in federal energy statute that plug loads are allowable energy conservation measures, another provision to clarify use of ESPCs for data centers.
- Clarify as energy savings the use, sale or transfer of energy incentives, rebates, or credits (including Renewable Energy Credits) from federal, state, local governments or utilities and any revenue generated from a reduction in energy use; more efficient waste recycling; or more energy generated from more efficient equipment.

#### **Conclusion**

The *Sustainable Energy in America Factbook* shows the dramatic changes underway in the United States energy sector. The Council appreciates and welcomes congressional consideration of policy measures to improve and enhance energy efficiency and looks forward to commenting further as the committee addresses energy legislation. For further information, please contact Ruth McCormick, Director, Federal and State Affairs, at [rmccormick@bcse.org](mailto:rmccormick@bcse.org) or visit the Council's website at [www.bcse.org](http://www.bcse.org).

Statement for the Record

Kateri Callahan, President  
The Alliance to Save Energy

Senate Energy and Natural Resources Committee  
April 30, 2015 Hearing on Energy Efficiency Legislation

May 11, 2015

My name is Kateri Callahan, I am the president of the Alliance to Save Energy (Alliance), and am pleased to testify before the Committee on behalf of the Alliance on the vital issue of energy efficiency. We are a bipartisan, nonprofit coalition of nearly 140 businesses, organizations and institutions -- spanning every sector of our economy -- that works to advance energy efficiency worldwide. Founded in 1977 by Senators Charles Percy, a Republican from Illinois, and Hubert Humphrey, a Democrat from Minnesota, we are honored to continue the Alliance's 38-year history of bipartisan leadership with 14 Members of the House and Senate serving as Honorary Members of our Board of Directors. Among our Honorary Board Members from this Committee who are helping us to advance energy efficiency are Alliance Honorary Chair Senator Jeanne Shaheen (D-NH), Alliance Honorary First Vice Chair Senator Rob Portman (R-OH), Senator Ron Wyden (D-OR), and Energy Committee Chair Lisa Murkowski (R-AK).

Since the founding of the Alliance to Save Energy, our country has made huge strides in driving energy efficiency in our economy through new technologies, private and public investment, and most importantly, through adoption of sound public policies. The United States has doubled its energy productivity -- we now get twice as much gross domestic product (GDP) from each unit of energy consumed than we did in 1970's -- and this translates into huge savings for American consumers and businesses on their energy bills. According to the American Council for an Energy-Efficient Economy (ACEEE), Americans saved \$800 billion on their collective energy bills last year thanks to energy efficiency.<sup>1</sup>

The EIA is forecasting further gains in energy productivity of 53% between now and 2030 just on a "business-as-usual" case, thanks in very large measure to the wide array of energy efficiency policies that Congress already has put into place, including appliance and equipment

---

<sup>1</sup> Referenced in the testimony of Steven Nadel, Executive Director of the American Council for an Energy-Efficient Economy (ACEEE), before the Senate Energy and Natural Resources Committee on April 30, 2015.

standards, fuel economy standards, and building energy codes to name a few of the critical policy areas. But, our country will be poorly served if we do not continue to put in place innovative and cost-effective policies that will increase the pace of energy efficiency adoption across the entire economy.

At the Alliance to Save Energy we believe we can once again double our energy productivity as a nation, this time within only the next 15 years, achieving the goal by the year 2030. An independent, economic analysis of the impact of achieving this goal found that doubling energy productivity would reduce the energy bills of American families by more than \$1,000 per year and create 1.3 million new jobs, while reducing CO2 emissions to 1/3 below the level emitted in 2005. This is a bold and audacious goal, but eminently doable if we enact the right policies.

Fortunately, and likely driven by the past policies that have helped us to cut energy waste out of the economy, we meet at a time when the Members on both sides of the aisle and in both chambers are placing a first priority on energy efficiency as energy legislation is being developed. We have just witnessed an important milestone with final passage in the House and subsequent enactment of S. 535, the Energy Efficiency Improvement Act, last month. I was honored to represent the Alliance at the Presidential signing ceremony for S. 535 on April 30th, marking the first energy bill of the 114<sup>th</sup> Congress to be signed into law. Building on the momentum of that accomplishment, we believe the timing is right to start moving more bipartisan energy efficiency bills as early as we can in this session.

Twenty-two bills are currently under consideration by the Senate Energy and Natural Resources Committee, and with the Energy and Commerce Committee in the House of Representatives beginning its work on a comprehensive energy bill that will include an efficiency title, we anticipate a similar number of proposals to emerge in the House. I commend the Chair and the Committee for the inclusive approach you are taking to developing comprehensive energy legislation, while at the same time continuing to work on the energy efficiency bills that are already pending before the Committee.

In that regard, we urge the Committee to proceed to early consideration of **S. 720, the Energy Savings and Industrial Competitiveness Act of 2015**, also known as the Portman-Shaheen bill.

The Portman-Shaheen bill would help address America's four related goals of increasing energy productivity, enhancing energy security, reducing harmful emissions and promoting economic growth in a financially responsible manner. Additionally, Portman-Shaheen addresses energy savings in the federal government – the nation's largest energy consumer – and includes provisions that expand energy efficiency savings and benefits to all sectors of the U.S. economy, from schools and homes, to commercial buildings, and to industry and manufacturing. On behalf of the Alliance, I strongly encourage the Committee to ensure that this bipartisan, non-

controversial, common-sense bill receives Committee approval and reaches the Senate floor expeditiously.

With respect to other energy efficiency bills that were considered by the Committee during the March 30 hearing, the Alliance urges strong support for each of the following bills:

- **S. 523 – A bill to coordinate the provision of energy retrofitting assistance to schools (Sponsored by Sens. Collins, Warner, Ayotte, and Merkley).**
  - The bill designated the Department of Energy (DOE) as the lead Federal agency for coordinating and disseminating information on existing programs that schools can use to initiate, develop and finance important energy efficiency retrofitting projects.
- **S. 600 – A bill to require the Secretary of Energy to establish an energy efficiency retrofit pilot program (Sponsored by Sen. Klobuchar).**
  - The bill would establish a pilot program to award grants for the purpose of retrofitting non-profit buildings with energy efficiency improvements under guidance from DOE.
- **S. 703 – The Weatherization Enhancement and Local Energy Efficiency Investment and Accountability Act of 2015 (Sponsored by Sens. Coons, Collins, Reed, and Shaheen).**
  - The bill would reauthorize the Weatherization Assistance Program (WAP) and the State Energy Program (SEP) which provide much needed assistance in the form of energy retrofit programs for low-income, single-family and multifamily housing.
- **S. 723 – The Utility Energy Service Contracts Improvement Act of 2015 (Sponsored by Sens. Schatz, Alexander, Coats, and Coons).**
  - The bill would clarify the rules governing the use of Utility Energy Service Contracts (UESCs) in order to encourage their widespread use.
- **S. 858 – The Energy Savings Through Public-Private Partnerships Act of 2015 (Sponsored by Sens. Gardner, Coons, Portman, and Shaheen).**
  - The bill encourages the use of Energy Savings Performance Contracts (ESPCs) and Utility Energy Service Contracts to address energy consumption in the federal government.
- **S. 869 – The “All-of-the-Above” Federal Building Energy Conservation Act of 2015 (Sponsored by Sens. Hoeven, Manchin, Donnelly).**
  - The bill would require each Federal agency to reduce its energy consumption per gross square foot by a certain percentage each year. Additionally, Federal officials would be required to conduct energy and water-use surveys to identify energy and water savings measures.

- **S. 878 – A bill to establish a State residential building energy efficiency upgrades loan pilot program (Sponsored by Sen. Sanders).**
  - The bill would establish a program under DOE that would make available to eligible entities loans for households financing for residential building energy efficiency upgrades.
- **S. 893 – The Energy Productivity Innovation Challenge (EPIC) Act of 2015 (Sponsored by Sens. Warner and Manchin).**
  - The bill would establish the Energy Productivity Innovation Challenge to assist energy policy innovation in the States to promote the goal of doubling electric and thermal energy productivity by 2030.
- **S. 1038 – the ENERGY STAR Program Integrity Act (Sponsored by Sen. Risch).**
  - The ENERGY STAR program has helped American consumers and businesses invest in energy efficiency and drastically cut energy costs. The program has also helped manufacturers push the research envelope, leading to job creation and the development of transformative technologies.
- **S. 1044 – The E-Access Act or the Access to Consumer Energy Information Act (Sponsored by Sen. Markey).**
  - The bill empowers consumers with information about their energy use and would spur innovation in energy efficiency by making information on electricity prices and consumption available for businesses and households.
- **S. 1046 – The Smart Building Acceleration Act (Sponsored by Sen. Cantwell).**
  - The bill is designed to accelerate the adoption of smart building technologies in the private sector and key Federal agencies.

The Alliance urges the Committee to move forward with these bills while continuing to craft comprehensive energy legislation. While we are pleased at the number of energy efficiency bills under consideration by the Committee, we are concerned that some of the bills included for consideration at the April 30 hearing will actually serve to impede, and/or “roll back” the progress we are making to drive greater energy productivity. We strongly urge the Committee to oppose altogether or to consider significant changes to the following bills under consideration:

- **S. 939 – A bill to require the evaluation and consolidation of duplicative green building programs within the Department of Energy (Sponsored by Sens. Flake and Booker).**
  - The bill would require DOE initiate a study on Green Buildings programs at DOE with an eye for consolidating or eliminating programs.
- **S. 1047 – A bill to require the Secretary of Energy to review rulemaking proceedings of other Federal agencies for the potential to cause an adverse effect on the cost, time or**

**difficulty of complying with energy efficiency regulations, guidelines or standards (Sponsored by Sen. Alexander).**

- **S. 1048 – A bill to remove the authority of the Secretary to amend or issue new energy efficiency standards for ceiling fans (Sponsored by Sen. Alexander).**
  - This bill would set a bad precedent and undermine the Department of Energy’s established appliance standards process that has provided clear results in bolstering energy productivity.

Lastly, the Alliance to Save Energy views the nexus between energy and water as a critically important issue for our nation’s future. As a result, in January 2015, the Alliance established an “energy-water nexus subcommittee” that would focus on how the efficient use of water has a direct benefit to the efficient use of energy, including in the drinking and wastewater treatment and delivery services, industrial, commercial building, and building services sectors. The group seeks to advance existing and new technologies that increase energy and water efficiency, while bolstering our overall economic competitiveness through increased energy productivity.

The Alliance energy-water nexus subcommittee is pleased to see the efforts by the Chair to advance comprehensive legislation that would include both energy and water efficiency provisions, especially those contained in the following bills (some of which I have already mentioned in my testimony):

- **S. 720 – The Energy Savings and Industrial Competitiveness Act of 2015 (Sponsored by Sen. Portman).**
  - Title II- Industrial Efficiency and Competitiveness- Manufacturing energy efficiency.
- **S. 723 – The Utility Energy Service Contracts Improvement Act of 2015 (Sponsored by Sen. Schatz).**
  - To provide guidance on utility energy service contracts used by Federal agencies and for other the utility energy service contract (referred to in this section as “UESC”) developed to provide Federal agencies an effective means to implement energy efficiency, renewable energy and water efficiency projects at Federal facilities.
- **S. 858 – The Energy Savings through Public-Private Partnerships Act of 2015 (Sponsored by Sen. Gardner).**
  - To encourage the increased use of performance contracting and the use of energy and water efficiency measures in Federal facilities.
- **S. 869 – The All-of-the-Above Federal Building Energy Conservation Act of 2015 (Sponsored by Sen. Hoeven).**
  - Implementation of identified energy and water measures in a federal agency.
- **S. 886 – The Smart Energy and Water Efficiency Act of 2015 (Sponsored by Sen. Udall).**
  - Implementation of a smart energy and water efficiency pilot program to demonstrate novel and innovative technology-based solutions to increase the

energy efficiency of water, wastewater, and water reuse at a utility, municipality, water district or other provider of water, wastewater or water reuse services.

It is our hope that the Committee will continue to move energy efficiency bills including the Portman-Shaheen bill, even as work proceeds on the bigger comprehensive bill. And, should the process of moving a comprehensive bill slow or stall, then we hope that the Committee will consider action on the aforementioned bills, separately from the rest of the comprehensive bill. Where there is broad bipartisan consensus and demonstrated, tangible benefit to our citizens and to our economy, we believe that it is important for Congress to act on these bills while work continues on the larger bill, which may take much longer to craft.

Thank you again for this opportunity to present the views of the Alliance to Save Energy and I look forward to working with Chair and all Members of the Committee on the important energy efficiency bills that are before you for consideration and hopefully approval this spring.

Respectfully submitted by,

Kateri Callahan, President

The Alliance to Save Energy



Douglas W. Peterson  
Sr. Director, Sales and  
Energy Efficiency

505 Nicollet Mall  
Minneapolis, MN 55402  
(612) 321-4753  
Fax: (612) 321-4873  
Doug.Peterson@CenterPointEnergy.com

April 28, 2015

Committee on Energy and Natural Resources  
United States Senate  
304 Dirksen Senate Building  
Washington, D.C. 20510

Re: Statement for the Record for the April 30 Efficiency Hearing in support of S. 1029

Dear Committee Members:

On March 12, 2015, the U.S. Department of Energy ("DOE") released a Notice of Proposed Rulemaking ("NOPR") proposing a nationwide minimum efficiency standard of 92% for natural gas furnaces. Contrary to the NOPR benefits cited by the DOE, analysis developed by the American Gas Association ("AGA") indicates that this proposed standard could have the unintended consequence of causing natural gas utility customers to pay higher energy costs, consume more energy and produce more environmental emissions. Further review of the proposal is needed to analyze the impacts of the proposed rule and determine whether it is technically feasible and economically justified. For this reason, CenterPoint Energy provides this testimony in support of S. 1029.

#### **The Need for Further Review**

CenterPoint Energy, headquartered in Houston, Texas, is a domestic energy delivery company that includes electric transmission & distribution, natural gas distribution and energy services operations. CenterPoint Energy operates natural gas distribution systems in the six states of Arkansas, Louisiana, Minnesota, Mississippi, Oklahoma and Texas and serves approximately 3.37 million natural gas customers throughout those six states. In addition, the Company's electric distribution company serves over 2.2 million electric customers in and around Houston, Texas.

For several months prior to and subsequent to the DOE's NOPR issuance, CenterPoint Energy worked with the AGA and its member gas utilities to research the impacts of a new condensing furnace standard on our customers, business partners, the environment, and natural gas public utilities. CenterPoint Energy agrees with the AGA's analysis, as discussed in more detail herein, finding that the proposed rule will in fact result in higher costs to consumers, an increase in net energy consumed, and an increase in environmental emissions.

The proposed DOE rule will significantly increase the cost of buying and installing a natural gas furnace. First, the cost of the higher efficiency equipment is more expensive than today's standard equipment. Second, the proposed rule will effectively change the furnace technology from the current standard of a "non-condensing" furnace to a higher efficiency "condensing" furnace. With the traditional non-condensing furnace, the furnace is vented through a vertical chimney, often in conjunction with a natural gas water heater. This is a standard construction practice, especially in the South. However, with a condensing furnace, the furnace must be vented directly out the side of the house, or in limited cases, using a specially-installed chimney liner. The venting requirements of the condensing furnace raises installation costs, creates additional penetrations in the side of the home, and can "orphan" the existing gas water heater, which then requires that a chimney liner be installed for the remaining water heater at additional cost. The condensing furnace also requires the addition of a condensate drain, an added change that is not required in the standard non-condensing furnace. All of these aspects of the condensing furnace increase its costs compared to a non-condensing furnace.

Not surprisingly, the AGA's analysis indicates that these higher natural gas furnace and installation costs will likely cause a significant percentage of consumers to "fuel switch" from natural gas to electric space heating. Direct use of natural gas in space heating appliances, however, greatly benefits the customer because of the significant energy losses that are inherent in the conversion of fuel to electricity. Consequently, customers with natural gas furnaces, as opposed to electric space heating equipment, use less energy overall, which lowers their energy costs and results in fewer environmental emissions. While the stated goal of the rule is to reduce emissions, reduce energy use and reduce customer costs, the higher equipment and installation cost could actually have the unintended effect of raising all three.

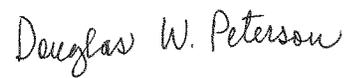
Unfortunately, the rule's unintended consequence of causing customers to move away from natural gas to electric space heating will disproportionately impact states with warmer climates. Because five of the Company's six states are located in the warmer southern portion of the country, CenterPoint Energy is particularly concerned about the impact this nationwide furnace efficiency standard could have on its southern states. Homes in the much warmer southern climate use less space heating throughout the year than those homes in colder climates. In the southern states we serve, CenterPoint Energy is already in serious competition with electric space heating applications such as the electric heat pump. Recent U.S. Energy Information Administration ("EIA") data indicates that the percentage of electric space heating in the Southern region is already significantly greater than natural gas space heating, and this gap has grown by 10 percentage points in the last ten years. The DOE's proposed rule will further accelerate this trend to an enormous extent, which will greatly jeopardize the natural gas space heating market in the South. This same negative impact will occur in the replacement furnace market, where in some cases a condensing furnace with its different venting requirements will not be able to be installed without spending several thousand dollars more in equipment and installation costs.

CenterPoint Energy has conducted its own cost analysis on the difference between condensing and non-condensing furnaces in its southern states. For example, in our Louisiana and Texas service areas, we have found that the condensing furnace costs an average of \$950 more than the traditional non-condensing furnace. The installation costs of the condensing furnace add another \$400 to this cost difference. Considering that moving from an 80% AFUE furnace to a 92% AFUE condensing furnace will only result in approximately \$35 in annual savings to average Louisiana and Texas consumers, it is safe to say that consumers will never recoup the higher upfront costs. Therefore, we believe that when builders and consumers are faced with these much higher up-front costs, a

very high percentage of them will simply choose to install an electric heater, to the detriment of their monthly energy bills and the environment. These impacts will be particularly detrimental to low-income customers in the southern states.

For these reasons, CenterPoint Energy supports S. 1029 and the proposed advisory group process that will allow interested stakeholders to further analyze the impact of the proposed nationwide condensing furnace efficiency standard. We encourage the committee to consider this legislation and support its inclusion in the final energy package.

Very truly yours,

A handwritten signature in cursive script that reads "Douglas W. Peterson".

Douglas W. Peterson

304

CHAMBER OF COMMERCE  
OF THE  
UNITED STATES OF AMERICA

R. BRUCE JOSTEN  
EXECUTIVE VICE PRESIDENT  
GOVERNMENT AFFAIRS

1615 H STREET, N.W.  
WASHINGTON, D.C. 20062-2000  
202/463-5310

April 29, 2015

The Honorable James Risch  
United States Senate  
Washington, DC 20510

Dear Senator Risch:

The U.S. Chamber of Commerce, the world's largest business federation representing the interests of more than three million businesses of all sizes, sectors, and regions, as well as state and local chambers and industry associations, and dedicated to promoting, protecting, and defending America's free enterprise system, commends you on the introduction of S. 1038. This legislation would promote the continued success of the ENERGY STAR program, a voluntary program that has promoted energy efficiency, job growth, and economic expansion.

S. 1038 addresses a simple but important issue regarding the ENERGY STAR program and would amend the Energy Policy and Conservation Act to prohibit private litigation against manufacturers should a product fall out of compliance with the program. The U.S. Environmental Protection Agency's enforcement mechanisms of public delisting and subsequent work with manufacturers to regain qualification have proven to be effective. Private litigation based on the ENERGY STAR listing would have a strongly chilling effect on manufacturer participation in the voluntary program.

The Chamber thanks you for introducing S. 1038 and looks forward to working with you on this important piece of legislation.

Sincerely,



R. Bruce Josten

cc: Members of the Senate Committee on Energy and Natural Resources

**Testimony for the Record  
The Coca-Cola Company**

**Submitted to the  
Committee on Energy and Natural Resources United States Senate**

**Hearing on Energy Efficiency Legislation  
May 13, 2015**

The Coca-Cola Company is committed to conserving and protecting natural resources so that we can continue to lower our carbon footprint and create a more sustainable world. As part of this effort, we are continuing our ongoing focus on water stewardship, energy and climate, packaging, and agriculture sustainability.

Coca-Cola aspires over the long-term to become water neutral – essentially returning the same amount of water we use back to the environment and local communities. We have saved almost 7 billion gallons of water since 2005 through water efficiency improvements. In North America we support more than 100 community watershed projects that help protect and conserve local water resources. We are working in partnership with the U.S. Forest Service to help restore and protect damaged watersheds on national lands.

Our investments in energy and climate have led to a 60% energy efficiency improvement in our cooling equipment since 2000. We operate the largest heavy-duty hybrid electric delivery fleet in North America with hybrid electric vehicles that reduce fuel consumption up to 30%.

More than 96% of the total waste in our North American production facilities is diverted from landfills, and in 2014 our light weighting initiatives resulted in a 70 million pound reduction in packaging materials compared to 2010 in North America. Since we launched the first-ever recyclable PET plastic beverage bottle made partially from plants in 2009, PlantBottle® packaging saved the equivalent of 150,000 metric tons of potential CO2 emissions in North America. On the agriculture side, we have invested \$2 billion toward the planting of 25,000 acres of new orange groves in Florida, creating about 4,100 new jobs by supporting the largest citrus planting of orange groves in Florida in the last 25 years.

Most significantly for today's hearing, Coca-Cola has since 2009 been working against a voluntary commitment to phase out vending machines and coolers using HFC-based refrigeration technology by 2015 and replace them with an alternative, more climate-friendly technology, something we call "natural refrigerants." We are on the leading edge of this transition and have been investing for many years.

Each refrigerant uses a slightly different technology to provide required cooling to the exact specifications required by each product. There are a myriad of models required by the marketplace, and each one requires an individual engineering process to perfect the technology. This is a time-consuming process, and in spite of years of investment, the supply chain for low-carbon equipment is not yet mature.

Today, we have placed 1.4 million HFC-free vending machines and coolers globally, and our work continues to reach our 100% goal for all new marketing equipment purchases.

However, in the last year, in conjunction with this forward-leaning work, we have come into contact with a set of competing Federal policy priorities to reduce energy consumption and greenhouse gas emissions that, if unresolved, are likely to deliver the opposite of intended results and hamper our ability to continue the transition to low-carbon refrigerants that we have underway.

In 2014, the Department of Energy issued a final rule setting energy efficiency standards for commercial refrigerators (coolers) (*Energy Conservation Standards for Commercial Refrigeration Equipment*; 79 FR 17725 (March 28, 2014).) As finalized, by March 2017, the rule calls for significant reductions in energy consumption from this equipment. This standard was based on the performance of equipment using HFC-134a, a refrigerant that has been in the marketplace for over 20 years with mature technologies readily available.

After the DOE rule was finalized, the Environmental Protection Agency (EPA) called for phasing out HFCs for use in new refrigeration equipment effective January 1, 2016 (*Protection of Stratospheric Ozone: Change of Listing Status for Certain Substitutes Under the Significant New Alternatives Policy Program*, 79 Fed. Reg. 46126 et seq. (August 6, 2014) – Docket ID Number EPA–HQ–OAR–2014–0198.)

It is doubtful that the stringent energy efficiency requirements in the DOE rule can be met even with mature HFC equipment for some machine types. With the speed of the EPA's proposed phase out of HFCs, users are already looking to alternatives, preferably low-carbon alternatives. However, it is clear that the majority of the few pieces of equipment that are even available using low-carbon natural refrigerants cannot meet the DOE efficiency standards.

Thus, users will be left having to leave older, less efficient equipment using HFCs in place for a longer period of time, negating both energy efficiency and greenhouse gas emissions reductions anticipated from both the DOE and the EPA rules. Or, users will race to the bottom, adopting the quickest available technology, as opposed to the best technologies, cutting off the type of innovation we need to move to a low carbon economy.

We believe this can be fixed with a number of specific actions; some of which are likely to require legislative action:

- Extend the EPA's proposed phase-out date for HFC-134a to 2020. This will allow the supply chain for equipment using low carbon refrigerants to mature;
- Conduct DOE testing of units using low carbon natural refrigerants to determine if the DOE standard can be met at all with technologies using these refrigerants; and waive the application of the DOE energy efficiency standard for units using natural refrigerants for a period of 3 years until 2020 for consistency with an amended EPA rule;
- Provide DOE with the one-time authority to revise the energy efficiency standard for coolers if necessary based on testing conducted on low carbon natural refrigerants rather than HFC-134a;
- Provide for an expedited waiver process at DOE for coolers that use low-carbon natural refrigerants but do not meet the DOE efficiency standard for a period of up to 3 years again until 2020 for consistency with an amended EPA regulation to phase out HFC use in new refrigeration equipment.

We thank the Committee for your consideration and look forward to working with you to resolve this issue and continue our transition to low carbon equipment.

Thank you.



April 29, 2015

The Honorable Lisa Murkowski  
 Chairman  
 Senate Energy Committee  
 U.S. Senate  
 Washington, DC

The Honorable Maria Cantwell  
 Ranking Member  
 Senate Energy Committee  
 U.S. Senate  
 Washington, DC

Re: S. 1029—Legislation Affecting Energy Efficiency Standards for Furnaces

Dear Chairman Murkowski and Ranking Member Cantwell :

The Consumer Federation of America (CFA) and the National Consumer Law Center (NCLC) (on behalf of our low-income clients) are writing in opposition to S. 1029 which would, in essence, prohibit the Department of Energy (DOE) from issuing much needed and long overdue improvements in efficiency standards for gas furnaces. Consumers continue to be harmed through energy bills that are higher than they should be because industry has been operating under a minimum standard that essentially was set over 25 years ago. Further delays to improving furnace efficiency standards will extend the economic harm to consumers.

The Department of Energy has demonstrated that there are substantial gains to be made in furnace efficiency that will save consumers money. The current process of setting the standards is unfolding at DOE to determine exactly where the standards should be set, and we believe strongly that the DOE process should be allowed to move forward and that Congressional action is completely unnecessary.

CFA and NCLC have long been advocates of furnace efficiency standards because they benefit consumers, particularly low income consumers. We advocated for stronger furnace efficiency standards, on a regional basis, in both the 2007 and 2011 DOE rulemakings.

It is hard to fathom that today's furnace standards essentially date back 28 years to 1987. Nominal improvement was made in the standards adopted by DOE in 2007. In fact, these standards which will take effect this year are virtually obsolete as nearly all furnaces on the market today already meet the 2007 standard level. Further delays will sacrifice consumer savings and result in increased energy waste.

We continue to remain supportive of cost-effective efficiency standards for gas furnaces for several reasons. Many homeowners lack the time or information needed to choose to upgrade to a

more efficient furnace, especially if they are doing an emergency replacement. Many others are renters - often disproportionately low-income consumers – who do not get to choose the furnace installed in their home, but do get stuck with needlessly high bills. National standards are a proven approach for spreading the benefits of energy-savings technologies.

While we would like to see some improvements to the proposed rule to make it more cost-effective for more consumers, we urge innovative approaches, NOT an end to the rulemaking process. For example, a small portion of consumers may face unusually high installation costs when replacing an 80% AFUE furnace with a condensing product. Efficiency and consumer advocates are working with industry stakeholders to explore approaches that would allow some non-condensing furnaces to be sold in special circumstances. Such an approach would result in a new standard that would benefit millions of households and provide an attractive option for the small number of households with particularly difficult installation problems

Lastly, we know from retrospective studies that DOE has overestimated the impact of efficiency standards on product prices. If installed prices for high-efficiency furnaces end up lower than DOE projections, the net savings for consumers will be higher. In addition, innovative venting technologies which are bringing down the cost of venting condensing furnaces, will add to consumer savings.

In closing, we ask that you allow the DOE process to proceed alongside the collaborative approaches which are taking place among industry and consumer and efficiency advocates. We believe this approach will yield the best results for consumers, including those with the most at stake – low-income consumers.

Thank you for your consideration of our views.



Charles Harak  
Senior Attorney for Energy Issues  
National Consumer Law Center  
On behalf of its low income clients



Mark Cooper  
Director of Research  
Consumer Federation of America

**Ripchensky, Darla (Energy)**

---

**From:** Shannon Baker-Branstetter <sbaker-branstetter@consumer.org>  
**Sent:** Wednesday, April 29, 2015 3:56 PM  
**To:** Ripchensky, Darla (Energy)  
**Subject:** Re: April 30, 2015 Hearing on Energy Efficiency Legislation

**ConsumersUnion**

POLICY &amp; ACTION FROM CONSUMER REPORTS

April 30, 2015

Energy and Natural Resources Committee Office  
 304 Dirksen Senate Building  
 Washington, DC 20510

**Re: April 30, 2015 Hearing on Energy Efficiency Legislation**

Dear Chairman Murkowski, Ranking Member Cantwell, and Members of the Committee:

Consumers Union, the policy and advocacy arm of Consumer Reports, is pleased to see progress on energy efficiency legislation in the Energy and Natural Resources Committee and urges the Committee to advance several bills that will help consumers save energy and money and to put aside legislation that would undermine consumer savings.

Consumers Union Supports Residential Sector Efficiency: S. 703, S. 878, S. 1044

Consumers deserve to have efficient products and homes that don't hurt their financial health through higher energy bills. Improving energy efficiency and diversifying the energy supply help consumers keep their energy costs under control. Helping consumers through increased support for weatherization and residential energy efficiency (**S. 703** (Coons) and **S. 878** (Sanders)) will help save consumers money on their energy bills and improve air quality by decreasing pollution. **S. 1044** (Markey) aims to enhance secure consumer access to their own electricity data, so they can more easily identify opportunities to cut their energy usage.

Some critics of government efforts to improve efficiency may argue that government support is unnecessary because market forces will dictate investments in all cost-effective efficiency. While this theory may sound appealing, in practical terms, billions of dollars of energy savings are in fact left on the table, especially when it comes to residential consumers. Theories abound on why this is the case, including market imperfections, lack of information, and misaligned price signals and incentives. The reality is that most residential consumers do not think of efficiency as an opportunity for a return on investment, but they benefit from programs that help them realize the pocketbook savings of efficiency, which are then invested in other sectors of the economy.

Consumers Union Supports Federal and Institutional Efficiency: S. 720, S. 523, S. 600, S. 1063

**S. 720** (Portman), **S. 523** (Collins), and **S. 600** (Klobuchar) support initiatives to improve efficiency for large institutions and industry, schools, and non-profits, respectively. **S. 720** also paves the way to help homeowners who invest in weatherization or retrofits to attract additional buyers by taking into account the lower homeownership cost for efficient homes during the underwriting process. Setting national efficiency goals (**S. 1063** (Franken)) unifies the many facets of energy efficiency and would help raise the floor for efficiency

throughout the country.

Consumers Union Supports Efficient Energy Delivery: S. 888, S. 886, S. 1053

Modernizing infrastructure is also needed to improve the reliability and efficiency of energy delivery for consumers. Bills that encourage such modernization and innovation include **S. 888** (Schatz), which supports cooperative regional efforts to plan for a modern, reliable and cleaner grid and **S. 886** (Udall), which incentivizes innovation through piloting programs to save water and energy. **S. 1053** (Franken), recognizes the power of energy performance service contracts to reduce petroleum usage as well as electricity and natural gas and would help promote alternative fueled vehicle fleets and infrastructure.

Consumers Union Opposes Limiting Accountability and Blocking New Efficiency Standards: S. 1038 and S. 1048

Bills that limit accountability for appliance manufacturers to accurately label the efficiency of their products (**S. 1038** (Risch)) or remove DOE's authority to amend or issue new energy efficiency standards for ceiling fans (**S. 1048** (Alexander)) would take a step in the wrong direction and could be costly for consumers.

S. 1038 would undermine the integrity of the Energy Star program. Consumers rely on the Energy Star label to save energy and money, and manufacturers benefit from the voluntary program through product differentiation and price premiums. Because the Energy Star program is widely marketed to consumers who are interested in lowering their energy use and energy bills and often pay more for an appliance to pursue those goals, it is important that manufacturers and sellers who profit from marketing appliances certified under the program be directly accountable to consumers for statements made in that certification and marketing. Private claims for breach of warranty are a time-tested and well-established means of giving consumers that accountability. The prospect of government corrective action, even under the best of circumstances, is simply not an adequate substitute for empowering consumers to protect themselves and seek redress. Without this important check on manufacturers' use or misuse of the Energy Star label, consumer confidence in the label and the effectiveness of the program are likely to diminish.

By thwarting the inclusive DOE rulemaking process on efficiency standards for ceiling fans, S. 1048 could needlessly waste energy and leave consumer savings on the table. Efficiency standards for residential appliances have been a huge success in seamlessly saving consumers billions of dollars, and keeping the standards up to date with perpetually improving technology will accrue further savings.

In conclusion, Consumers Union urges the Committee to help improve Americans' economic and environmental health by building upon the proven benefits of increasing our nation's energy efficiency. Thank you for considering our views.

Sincerely,



Shannon Baker-Branstetter  
Policy Counsel, Consumers Union

**Consumers Union**

**Headquarters Office**

101 Truman Avenue  
Yonkers, New York 10703-1057  
(914) 378-2029  
(914) 378-2992 (fax)

**Washington Office**

1101 17th Street N.W. # 500  
Washington DC 20036  
(202) 467-6262  
(202) 265-9548 (fax)

**West Coast Office**

1535 Mission Street  
San Francisco, CA 94103-2512  
(415) 431-6747  
(415) 431-0906 (Fax)

**South West Office**

506 W. 14th, Suite A  
Austin, TX 78701-1723  
(512) 477-4431  
(512) 477 8934 (fax)

**U.S. Senate  
Committee on Energy & Natural Resources  
Hearing on Energy Efficiency  
30 April 2015**

**Statement for the Record  
Submitted by DNV GL**

DNV GL, an independent foundation founded in 1864, supports our customers across the energy value chain in ensuring reliable, efficient and sustainable energy, including using electricity more effectively and efficiently.

DNV GL respectfully submits this Statement for the Hearing Record for consideration by the Energy and Natural Resources Committee:

**Suggested Key Methods for the U. S. Federal Government to Promote Energy Efficiency in Buildings & Industry**

Energy efficiency is regarded by some as the least expensive source of energy and should be key element in energy policy and legislation. Both the House and the Senate have recently proposed a number of bills that address energy efficiency for commercial and residential use. Indeed, the recently enacted Energy Efficiency Improvement Act of 2015 addresses some aspects of energy efficiency. Further, the Energy Savings and Industrial Competitiveness Act (H.R.2177 and S.720, which are related to the Energy Efficiency Improvement Act, includes provisions for building codes, energy savings benchmarking and data collection, and third-party certification for Energy Star products is another positive step, but we believe that further action is required. Based on DNV GL's long experience in the practical application of energy efficiency, we suggest the following methods for consideration in legislation to promote energy efficiency.

**1. MARKET-ORIENTED AIR QUALITY REGULATION**

The trading system for criteria pollutants created by the Clean Air Act has been acknowledged to be a highly effective air quality regulation regime. Current efforts to regulate carbon emissions from power plants under Section 111(d) are expected to contribute to increased energy efficiency in electrical end uses, however, the details of how this is implemented will greatly influence the effectiveness of State plans. While implementation of State plans is not, strictly speaking, a legislative matter, budget support for the following

implementation elements will be critical to this initiative's success.

- a. **Require development of protocols and best practices to measure and verify energy use reductions achieved through energy efficiency efforts, particularly for those States that use "rate-based" as opposed to the "mass-based" measurement approaches for goal assessment.**

Requiring *standard* practices may be difficult to develop given the flexibility states have been granted in formulating their plans, however, requiring development of protocols and *best* practices maintains the State's regulatory authority, and is, essentially, a prerequisite for States to apply for and obtain budget support. Further, considering that EPA identified end-use energy efficiency as one of the "building blocks" it used in its "best system of emission reduction" used to both determine emissions reduction goals for each state and as a tool for states to design and implement their plans, a set of best practices for energy efficiency can offer the necessary direction and guidance, while indirectly setting minimum energy efficiency requirements for States as consider best practices, then implement the best practices that may unique for each State.

- b. **Develop general guidelines for assessing "additionality" of energy efficiency improvements if savings are being used in a "rate-based" framework.**

The legislation should direct regulatory agencies to develop assessment guidelines and validate the effectiveness of those guidelines with a study of actual energy efficiency improvements achieved.

- c. **Increase support and funding of the DOE's State Energy Program.**

Because this program is already established and has relationships and communication channels with each state, it eliminates the need to create a new program to disseminate this information.

**2. PROMOTE DEVELOPMENT AND ADOPTION OF ENERGY-EFFICIENT END-USE TECHNOLOGIES****a. Develop minimum federal efficiency standards for key end-use products, along with testing and enforcement methods.**

Third-party certification of products, such as those bearing the ENERGY STAR brand, and other types of certifications should be required to verify compliance with energy efficiency standards and tests.

**b. Further develop and support the national ENERGY STAR brand to confer market value on models that exceed minimum federal standards and stronger preference for Energy Star products, especially those that exceed minimum standards.**

Purchase of ENERGY STAR goods led to savings of roughly 70 million metric tons of carbon last year v. emissions associated with conventional models – more than 3x the carbon reductions from all utility energy efficiency programs.

**c. Continued support for research and development.**

Development of basic energy efficiency technologies in lighting, combustion for domestic and commercial furnaces, integrated industrial production systems, refrigerators have all been heavily supported by the Department of Energy over the past 30 years and should be continued. Congress may consider requiring statistical data to verify effectiveness, innovation and related gains for this research and development.

**3. PROMOTE DEVELOPMENT AND ADOPTION OF ENERGY-EFFICIENT FACILITY MANAGEMENT PRACTICES**

Energy efficiency professionals have identified the promotion of best practices in energy-oriented operation and maintenance of commercial and industrial

---

Page 4 of 8

facilities as one of the largest untapped sources, and cost-effective methods, of energy savings and carbon emission reduction. The Federal government has supported a number of important initiatives in this area, but it remains ripe for additional work.

**a. Competitively commission pilot programs to identify and field test good practices.**

The Department of Energy and EPA have had fairly successful programs in the following areas: energy consumption benchmarking and analysis; the "Green Dot" bill presentation protocols, industrial electric motor system repair and industrial compressed air systems. Building upon these programs will identify new ways to increase energy efficiency.

**b. Document and promote best practices.** Engage existing industry associations or local programs to reach end-users on a large scale.

**c. Create certification programs supported by market value.**

Certification of operating standards or management systems, such as ISO 9001/2 for quality, has thrived in the private market because companies place a value on the certification and the verification by an independent third party, because there is a regulatory reward or because their customers require this certification. For example, the German government provides tax credits to companies whose energy management practices have been certified under the ISO 50001 standards. The Department of Energy has developed a program to encourage companies to adopt those management practices, but companies have not undertaken the certification, and realized the benefits of the requirements to obtain the certification, largely because they don't perceive any market or regulatory value. Preferred supplier programs and associated incentives, possibly tax credits or a requirement that federal require ISO 50001 certification will provide an incentive for companies to adopt the standard.

---

---

**4. SUPPORT CITY-LED SUSTAINABILITY AND RESILIENCY INITIATIVES FOR ENERGY EFFICIENT COMMUNITIES**

Cities and local governments are increasingly interested in energy and emissions reduction initiatives to support sustainable, more livable communities. In particular, local governments have the unique ability to greatly influence and engender energy efficiency in existing buildings through permitting and time-of-sale activities.

**a. Provide additional funding and support innovative financing for cities.** Many local governments have developed climate action plans and energy action plans to support community goals which include ambitious energy efficiency targets. Recent legislation, such as the Property-Assessed Clean Energy (PACE) program, has been critical to supporting local efforts.

**b. Support energy use disclosure, energy audits and benchmarking requirements.**

Additional standardization for mandatory energy use disclosure requirements for local governments is needed, as proposed in H.R.2177 and S.720. In particular, local governments need better energy data from utilities to understand community energy use characteristics.

**c. Technical assistance for emerging technologies piloted at the local government level.**

New technologies associated with "smart city" concepts spanning integrated demand response, home area networks, smart meters, and distributed generation combined with energy storage are needed to help cities to meet their sustainability and energy efficiency goals. The federal government can fund and direct research and development to identify and commercialize new and promising technologies by both National Laboratories and commercial companies.

## Page 6 of 8

In the table below, we highlight legislation currently under consideration by the Energy and Natural Resources Committee that we believe are most relevant to improve energy efficiency in the United States. We have rated them according to their relevance to the issues raised above.

The range reflecting our judgment is:

(-) = negative; 0 = none, L = Low, M = Medium, H = High

Number	Short Title/Description	Relevance/Potential Effects			City-Led Initiatives
		Emissions Regulation	Energy Efficient Technologies	Energy Efficient Practices	
703	Reauthorization of Weatherization Assistance and State Energy Policy Programs	L	L	M	L
869	Mandates reductions in energy use in Federally-owned facilities by 36% per square foot by 2017	0	L	L	0
878	Residential Energy Loan Program	0	L	L	L
886	Funds small pilot programs by municipalities in joint energy and water conservation	0	L	M	H
888	Funds regional partnerships to increase the resilience of major energy infrastructure	0	0	0	M

Page 7 of 8

Number	Short Title/Description	Relevance/Potential Effects			City-Led Initiatives
		Emissions Regulation	Energy Efficient Technologies	Energy Efficient Practices	
<b>893</b>	Energy Productivity Innovation Challenge: small grants administered by states to increase productivity per unit of energy consumed	<b>O</b>	<b>L</b>	<b>L</b>	<b>M</b>
<b>1039</b>	Requires certain agencies to conduct assessments of data centers and develop plans to achieve energy cost savings	<b>O</b>	<b>L</b>	<b>L</b>	<b>O</b>
<b>1044</b>	Enhance consumer access to energy consumption information – develop voluntary guidelines for states to adopt	<b>O</b>	<b>O</b>	<b>M</b>	<b>H</b>
<b>1046</b>	Accelerate the adoption of smart building technologies in the private sector and in key Federal agencies: ID model buildings,	<b>O</b>	<b>L</b>	<b>L</b>	<b>H</b>

Page 8 of 8

Number	Short Title/Description	Relevance/Potential Effects			City-Led Initiatives
		Emissions Regulation	Energy Efficient Technologies	Energy Efficient Practices	
	document performance, disseminate info. – 18 month effort				
<b>1052</b>	Study of impact of state and local building performance benchmarking programs: \$10 million in grants for implementation to utilities and municipalities	<b>O</b>	<b>L</b>	<b>M</b>	<b>H</b>
<b>1054</b>	American Energy Efficiency Act: establish energy efficiency resource standard for all retail electricity and gas suppliers (regulated and unregulated above a certain size)	<b>M</b>	<b>M</b>	<b>M</b>	<b>L</b>
<b>H.R.2177 and S.720</b>	The Energy Savings and Industrial Competitiveness Act	<b>O</b>	<b>H</b>	<b>H</b>	<b>M</b>

**Joint Statement for the Record**  
**U.S. Senate Energy and Natural Resources Committee**  
**Hearing April 30th**  
**By**  
**Efficiency First**  
**Home Performance Coalition**

Thank you for the opportunity to submit joint testimony on behalf of the Home Performance Coalition (HPC), a non-profit 501c3 that advances policy change through policymaker education, stakeholder engagement, research, trainings and conferences for companies, businesses and other stakeholders in the home performance industry and Efficiency First, the national business association for companies in the home performance industry. Efficiency First works with its members made up of energy efficiency contractors and allied companies across America to advocate for public policy that accelerates the growth of the residential energy efficiency sector to provide value for homeowners, grow strong businesses that create jobs, and help America meet its energy goals.

Efficiency First and the Home Performance Coalition want to applaud the Senate Energy and Natural Resources Committee for holding the important hearing on energy efficiency legislation. As you know energy efficiency is a critical energy resource and is essential to our country's energy independence. With more than 113 million residences consuming 22% of all U.S. energy, it is vital that the residential sector play a critical part of any program that targets emission reductions.

The committee considered an array of bills at the hearing. Efficiency First and the Home Performance Coalition have worked with a number of offices to (i) emphasize the importance of the residential market and (ii) seek innovative solutions to addressing the challenges of increasing the energy efficiency of America's homes. It is imperative that residential energy efficiency be included as a significant part of the strategy for achieving America's energy and climate goals, and toward that end we support legislative efforts such as those outlined below that strive to strengthen and grow the residential energy efficiency industry:

- S. 720 – Energy Savings and Industrial Competitiveness Act of 2015 (Portman-Shaheen)
- S. 600 – Energy Efficiency Retrofit Pilot Program (Klobuchar)
- S. 703 – Weatherization Enhancement and Local Energy Efficiency Investment and Accountability Act (Coons)
- S. 878 – Residential Energy Savings Act (Sanders)
- S. 888 – The Prepare Act (Schatz)
- S. 893 – Energy Productivity Innovation Challenge Act of 2015 (EPIC) (Warner)
- S. 1044 – Access to Consumer Energy Information (Markey)

Residential contractors who focus on energy efficiency work every day with homeowners, sitting at kitchen tables across America, helping them understand why their energy bills are so high, their

daughter's bedroom is so cold, or their son's asthma acts up when the furnace is on. American's understand that energy efficiency is about their home economics, but it is also about their home's comfort and their ability to raise their families there.

The average American family spends over \$1,800 per year on energy, which equates to over \$200 billion. This represents about half of US buildings' energy consumption<sup>i</sup>, 35 percent more energy than is used for passenger cars and trucks combined<sup>ii</sup>. Energy efficiency is unique in that it creates its own cash flow - less money spent on energy means more money to purchase groceries and save for college. Simply put, saving energy pays for itself.

America's families, however, also face the stiffest barriers in gaining the benefits of energy efficiency. Most households don't have the technical savvy needed to sort out their efficiency choices. Builders and landlords make the rest of the energy efficiency decisions, but chronically fail to invest in the most efficient technologies or designs. Financiers overlook home retrofit markets because the transactions are too small. The result is that America's homes hold enormous efficiency opportunities—but policymakers must act if this potential is to be realized.

Retrofitting inefficient homes will put energy savings back into the wallets of American families and communities. It will also create hundreds of thousands of US jobs in some of the hardest hit industries, including construction and manufacturing. These new jobs are primarily created by small businesses - jobs that cannot be outsourced, and the materials used in improving homes are on average 90% made in the USA<sup>iii</sup>.

To that end we urge the committee to consider two pieces of legislation soon to be introduced in the Senate as a complement to any energy efficiency legislation.

#### **The HOMES Act**

Public investment in residential energy efficiency is smart policy that stimulates private sector spending and job creation, while driving savings directly to American households. One bill that has not yet been introduced in the Senate (though has bi-partisan support in the House) is the Home Owner Managing Savings Act.

Historically, energy efficiency incentives have largely been targeted at specific technologies and individual improvements. Rather than "picking winners," a performance-based incentive links incentives to - savings, which allows for technology and business model neutrality. Rather than attempting to maintain an exhaustive, up-to-date list of equipment specifications, offering incentives based on savings at the meter can allow the rebate to keeping pace with an ever-changing industry and react to market forces.

Last month, Congressman David McKinley (R-WV) and Peter Welch (D-VT) introduced HR 2194, The Home Owner Managing Energy Savings Act. This bill provides rebates for homeowners to help cover the cost of a home energy efficiency upgrade. Homeowners begin by hiring an accredited contractor to perform the work; an important criteria that ensures that the contractor is well trained and certified

to perform energy efficiency home retrofits. Prior to the start of the project a home energy audit will be performed. The audit will allow the homeowner to sit down with the contractor and select the desired energy savings for the home and scale the project according to the homeowner's budget and their home's needs.

A qualified retrofit under the HOMES Act will be carried out by the contractor and the homeowner's rebate will be based on the predicted energy savings. Rebates may not exceed 50 percent of expenditures so the homeowner will always be paying for at least half of the upgrade. It is important that any tax dollars spent are spent acquiring a public good – energy savings. The HOMES Act would lead to higher performing homes and reduced energy usage across America.

#### **REEVA and Energy Efficiency as a Resource**

Another piece of legislation awaiting introduction in the Senate is the Residential Energy Efficiency Valuation Act (REEVA) – a pilot program to allow the market to determine how public investment can best be leveraged to deliver actual energy savings and help the residential energy efficiency sector achieve scale. Energy Efficiency is America's greatest and most abundant energy resource. The small business contractors tap this resource every day, providing heat and cooling in American homes at a fraction of the energy used before. Our organizations believe that the energy efficiency resource can and should be tapped for America.

REEVA is a grant program to states to fund pilot programs that provide payment for units of energy savings from groups of home energy retrofit projects, creating accountability for savings predictions using actual metered results. The program will ensure that the aggregated real energy savings provided by a contractor or group of contractors determines a significant percentage of the incentive payment. The contractor or aggregator will be accountable for the amount of savings that they can achieve through comprehensive energy retrofits, as they leverage public or private mechanisms (like financing), and turn those payments into compelling offerings for customers – and the form of these offering will be based on the private market.

The purpose of REEVA is to establish state pilot programs that can produce measured energy savings from residential energy efficiency retrofits in a standardized manner. These state pilot programs, will utilize federal resources to provide payment to companies based on measured energy savings from residential retrofits. Like HOMES, this legislation pays for energy savings. But unlike HOMES, the payments are for measured savings, not predicted, and are determined by the amount of energy saved, not by the percent savings for each home. A measured savings approach has two potential advantages: 1) It would improve EM&V methods and over time result in more accurate determinations of savings; and 2) A more market-driven structure for delivering savings would let policymakers, regulators and utilities focus on paying for verified savings while allowing the private sector to better innovate on successful ways to deliver energy savings in the market.

One of the key shifts to begin accounting for the multiple benefits of energy efficiency, is to move towards accounting for energy efficiency as a resource -- the demand reduction equivalent of supply-side energy production. Funds used to provide rebates or payments for energy savings are funds not needed to build power plants, ship fuel, or lay new power lines because those energy savings will make those investments unnecessary. Reducing demand on the grid through energy efficiency is akin to building power plants, only cheaper -- and it's 100 percent domestic, and completely clean. And it will make the grid more resilient now and in the future.

Both of these bills have an important purpose. REEVA is a pilot effort to prove that America's highly trained contractors can mine for energy from America's homes through comprehensive retrofits. Those contractors will provide rebates based on the market and sell the energy to the program or aggregator. This type of innovation is important to taking the measured savings we are seeing from our smart technology and translating it into marketable savings. The HOMES act allows solid predictions to stand for performance. Unlike REEVA, the HOMES act has specific requirements for contractors to ensure that those making the predictions are qualified to perform the work and ensure the savings is realized. Both bills allow states to meet the market, contractor base, and the energy programs where they are and use the best method of energy savings available. There are no losers with these bills and the biggest winner is the American homeowner.

Homeowners are being asked to make energy efficiency investments not only because they want to save money on their utility bills, but because this reduces costs across the energy system as a whole; helps to achieve broader public policy goals such as energy independence; reducing pollution; and enabling job creation. However, we are not properly valuing these very real public and resource benefits energy efficiency provides. Instead, we are asking homeowners to pay for the full burden and cost of these improvements, often upfront and out of pocket. With dropping energy prices, the projected monetary value of the energy savings is typically modest with much of the value of these energy savings unrealized. Incentives can change these calculations and offer additional value to the homeowner<sup>39</sup>, the value of the public good.

#### **Why Congress Must Act**

The major market factors we need to make this the home performance industry economically sustainable over the long haul are already here, only not yet to scale. Every other energy resource receives incentives, despite already having grown to scale. Home performance is just getting there, but because it faces unique and persistent market barriers, it needs policy action to reach the scale that is needed.

America's capital markets know how to finance large energy supply projects, because they are large enough to bear the transaction costs, but financial markets are not attracted to residential energy efficiency, despite its strong policy case, because the transaction costs are too high. Most investment bankers will gladly meet to discuss a \$100 million project, but few are willing to look into \$10,000 or \$5,000 investments; they are just too small.

A growing segment of the contracting industry is actively moving toward performance-based approaches. Dedicated home performance companies have grown in markets across the country (e.g. Efficiency First contractors in all states) and we are seeing leading contractors in more traditional markets finding success moving to home performance. Major manufacturers and contractor organizations are investing in initiatives to provide home performance training and resources to HVAC, Insulation, and other trade contractors. The concepts of home performance have taken root beyond early adopters.

We believe that a combination of a smart national incentive driving the market toward performance, coordinated with local infrastructure, will enable a transformation in the residential energy efficiency market. The HOMES Act and REEVA are truly a unique opportunity to give homeowners another option for making deep energy efficiency improvements to their home, build wealth in American households, support small contracting businesses and its US-centric manufacturing and supply chain, all while helping the country meet its climate and energy goals.

We appreciate the ongoing efforts of this Committee and look forward to continuing to support your important work.

Government Affairs Contact:

Kara Saul-Rinaldi  
202.276.1773  
kara@anndyl.com

---

<sup>i</sup> US Energy Information Administration: [Annual Energy Review 2011](#)

<sup>ii</sup> US Energy Information Administration: [Annual Energy Outlook 2010](#)

<sup>iii</sup> Home Performance Resource Center: [Manufacturing Shares of Common Energy Remodeling Products](#)

<sup>iv</sup> National Home Performance Council: [Bringing on the Boom and Beating the Bust](#), April 2013

May 13, 2015

The Honorable Lisa Murkowski  
Chairman  
Senate Energy and Natural Resources  
Committee  
304 Dirksen Senate Building  
Washington, DC 20510

The Honorable Maria Cantwell  
Ranking Member  
Senate Energy and Natural Resources  
Committee  
304 Dirksen Senate Building  
Washington, DC 20510

Dear Chairman Murkowski and Ranking Member Cantwell:

On behalf of the undersigned businesses, we thank the Senate Energy and Natural Resources Committee for holding a hearing on April 30, 2015 on energy efficiency legislation. We appreciate the opportunity to submit our comments for the record and express our strong support for policies that promote energy efficiency in industrial, commercial and residential applications.

Our group of businesses is committed to promoting low to no-cost, no-mandate bills that advance energy efficiency through reduced regulatory burden, increased transparency and a focus on the federal government as a first mover to save taxpayer dollars on energy bills. We believe that many of the bills being considered by the committee, if passed, would combine to have a demonstrable positive impact on the U.S. energy economy.

**We Support the Following Energy Efficiency Bills Being Considered:**

**S. 720 Energy Savings and Industrial Competitiveness Act**

Our group of businesses has supported this common sense piece of legislation written by Senators Portman and Shaheen for numerous years. While the bill has changed slightly from previous Congresses it has always had strong bi-partisan support. We believe this bill to be a win-win approach that will help reduce energy consumption, bring new efficiency technologies online faster, produce energy savings for businesses and families alike, and encourage private-sector job creation that will lead to a stronger American economy over the long haul. Some of the provisions we are most enthusiastic about include the building codes section, the Federal energy related provisions and the SAVE Act for residential mortgages. Some of these have also been introduced as stand-alone legislation.

**S. 869 All-of-the-Above Federal Building Energy Conservation Act of 2015 *(also in S.720)***

Introduced by Senators Hoeven, Manchin and Donnelly, the bill was developed by a diverse coalition of industry, efficiency and environmental advocates. The result of that process is a broadly-supported, bi-partisan bill that dramatically improves energy efficiency. The proposal would save taxpayers money by enhancing the energy efficiency of federal buildings. It would repeal a requirement on fossil fuel-generated energy consumption in new and renovated federal buildings, but strengthen broader energy targets and other direction to federal agencies.

**S. 1046 to accelerate adoption of smart building technologies**

This bill by Senator Cantwell would encourage the expanded use of smart building technologies as well as including pilots of integrated smart building technologies at a handful of federal agencies.

**S. 858 Energy Savings through Public-Private Partnerships**

This bill, introduced by Senators Gardner, Coons, Portman and Shaheen, will help ensure that federal agencies are utilizing to the fullest extent possible all cost-effective measures for energy conservation. The legislation promotes transparency and accountability across the federal government and will further enable federal agencies to maximize their present energy efficiency contracting authorities. The legislation streamlines the ESPC statute providing consistency and clarification within the existing ESPC law. The bill further supports the ability of federal agencies to leverage the private sector for energy savings without relying on appropriated funds.

**S. 878 Residential Energy Savings Act (RESA)**

Introduced by Senators Sanders and Wyden, S. 878 would establish a pilot program for state loans for residential building energy efficiency upgrades.

**S. 1038 Energy Star Program Integrity Act**

This bill, introduced by Senator Risch, would provide liability protection to participants in the Energy Star program. Energy Star reduces energy consumption, improves energy security, and reduces pollution through voluntary labeling of products that meet the highest energy efficiency standards. The EPA's comprehensive certification and enforcement scheme ensures that products earn the Energy Star mark only after being tested by certified third-party laboratories, and the DOE and EPA both conduct off-the-shelf testing to verify that Energy Star products continue to meet program standards. If a certified product is found to be noncompliant with Energy Star standards, the EPA may disqualify the product from the program, and may require the manufacturer to offer consumer compensation. Despite the federal government's comprehensive control of the program, ENERGY STAR partners remain vulnerable to follow-on class action lawsuits when a product is disqualified. These lawsuits, which provide little benefit to consumers, threaten to undermine the ENERGY STAR program by making robust voluntary participation cost-prohibitive.

**S. 1052 Benchmarking**

This bill builds off the small Efficiency bill that was recently signed into law by requiring a study on the impact of state and local benchmarking and disclosure policies. It also includes a small competitive award program.

**S. 1053 Alternative Fueled Vehicle Fleets**

Introduced by Senator Franken, this bill would authorize the inclusion of alternative fueled vehicles and the associated infrastructure in ESPCs.

**S.1044 E-Access**

The bill, introduced by Senator Markey, requires the Department of Energy to expand access to the State Energy Program to new state-led efforts at making consumer energy information more easily available. It also requires the Department to issue model standards for electricity usage information programs and to assist eligible states in implementing such programs. This will allow consumers to have more access to their own energy usage data and to use such data to reduce energy use as they see fit.

**S. 723 Utility Energy Service Contracts Improvement Act**

This bill, introduced by Senator Schatz with bipartisan cosponsors, extends the allowable term of Utility Energy Service Contracts (UESC) contracts for up to 25 years. This will make the allowable contract term the same as allowed for Energy Savings Performance Contracts (ESPCs.) We support this effort as it

includes language that ensures, long term UESC projects include energy savings measurement and verification as well as a guarantee or assurance for the federal customer.

**S.1029 Energy Conservation Standards for Non-weatherized residential furnaces**

This bill encourages affected stakeholders of DOE's proposed energy conservation standard for non-weatherized gas furnaces to complete an analysis of a nationwide requirement of a condensing furnace efficiency standard. The effect of the legislation is to encourage the DOE and interested stakeholders, including manufacturers, home builders, home owners, energy efficiency advocates, consumer groups and natural gas utilities to improve DOE's proposed rule.

**Other bills not being considered in this hearing but will positively affect energy efficiency:**

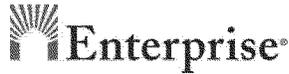
**S. 1054 Smart Manufacturing**

Introduced by Senator Shaheen this bill encourages the use of smart energy-saving techniques in manufacturing. This bill encourages smart, integrated efficiency technologies in the manufacturing sector by working through existing programs. Federally opened or operated manufacturing facilities could also benefit from addressing their energy spend and becoming more energy efficient through an internationally accepted ISO 50001 certification. We hope to see this proposal included in the final package.

In closing, we once again thank the Senate Energy and Natural Resources Committee for holding this hearing and applaud the efforts of its members to advance pragmatic, reasonable energy policies.

Sincerely,

Danfoss  
Ingersoll Rand  
Johnson Controls  
Owens Corning  
Schneider Electric  
Siemens  
United Technologies  
Whirlpool



The Honorable Lisa Murkowski  
709 Hart Senate Office Building  
Washington, D.C. 20510

The Honorable Maria Cantwell  
511 Hart Senate Office Building  
Washington, D.C. 20510

April 28, 2015

Dear Chairwoman Murkowski and Ranking Member Cantwell,

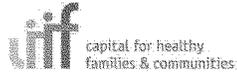
The undersigned organizations would like to express our support for the *Energy Savings and Industrial Competitiveness Act of 2015* (S. 720). This bipartisan energy efficiency legislation includes a pay-for-success multifamily energy and water conservation demonstration, which leverages private sector resources and achieves cost savings in affordable housing.

The federal government is the single largest energy user in the United States. The U.S. Department of Housing and Urban Development (HUD) currently spends \$7 billion annually on energy and water. Through energy efficiency retrofits, HUD could achieve 20 percent or more in energy savings using tested energy efficiency solutions, which have a long history of successfully generating savings in the privately-owned commercial sector. The pay-for-success model would allow HUD to use these same types of performance-based contracts to conduct energy and water efficiency improvements in HUD-assisted multifamily housing with the goal of reducing costs to the federal government.

Under the proposed pilot program, intermediaries would raise private capital and work with energy service companies and/or others to make appropriate and economically justifiable upgrades to HUD-assisted properties. HUD would pay back investors only based on actual, verified savings.

Taxpayers would bear no risk, as the federal government would not incur any costs until energy savings are verified by a third party. Because this budget-neutral approach would leverage private investments from foundations and social impact investors to pay upfront costs, the federal government would not even incur costs after savings have been produced and verified.

A pay-for-success demonstration would address challenges currently faced by owners of affordable multifamily properties, including lack of capital, financial disincentives, regulatory barriers, and split incentives among building owners and tenants. Assisted housing property owners currently lack access to capital for this work, and if they borrow funds to conduct the retrofits, they cannot use the energy savings to service the debt, as the savings benefits ultimately flow to HUD – not to property owners. This proposal would allow a stream of non-federal capital from foundations to pay the upfront costs for energy efficiency measures, and the foundations would be able to recover their investments from the resulting energy savings, which would be shared with HUD.



Given this proposal's potential to harness private sector resources and approaches to lower energy costs without additional outlays, it has been included in numerous pieces of bipartisan legislation, including the Fiscal Year 2015 Senate Transportation, Housing and Urban Development bill.

We look forward to working with the Senate Committee on Energy and Natural Resources on this important issue.

Sincerely,

Enterprise Community Partners  
Stewards of Affordable Housing for the Future  
Low Income Investment Fund  
National Housing Conference  
Montgomery Housing Partnership  
California Housing Partnership  
Green and Healthy Homes Initiative  
Habitat for Humanity International  
Mercy Housing  
Housing Partnership Network



Statement of Environmental Defense Fund

U.S. Senate Committee on Energy and Natural Resources

Hearing on energy efficiency legislation, April 30th, 2015

Thank you for this opportunity to submit comments for the record of the Senate Committee on Energy and Natural Resources hearing on energy efficiency legislation on April 30th, 2015

Environmental Defense Fund supports the legislation considered at the hearing, S. 1044, proposed by Sen. Ed Markey (MA), to provide greater access to electric utilities' customer data.

For well over a hundred years, the electric industry focused on managing the production and delivery of energy rather than the consumption of it. As the electricity system is transforming into an innovative and interconnected ecosystem, it is crucial to engage and inform electric customers so that they can make informed energy choices and actively participate in this new environment. Providing customers with access to their energy consumption data not only empowers them to lower their utility bills, but data access is also essential to realizing a more efficient and cleaner electricity system that can smoothly integrate new distributed energy resources ("DER") such as electric vehicles and rooftop solar.

Most Americans today receive information about their energy usage through a paper bill which lacks basic information to motivate them to take control of their energy usage.<sup>1</sup> Yet, research shows that consumers conserve energy when they are provided with timely information on their energy use.<sup>2</sup> For example, a meta-review by the American Council for an Energy Efficient Economy (ACEEE) showed that energy-use feedback can help households reduce electricity consumption by 4-12%.<sup>3</sup> Another report review by the ACEEE buttresses these results, indicating that rapid feedback about energy usage can enable savings on average of 3.8% across large populations.<sup>4</sup>

---

<sup>1</sup> Foster, Ben and Elena Altshuler. 2011. "The State of the Utility Bill. Washington, DC: American Council for an Energy-Efficient Economy."

<sup>2</sup> Carrie Armel, K., et al.. 2012. "Is disaggregation the holy grail of energy efficiency? The case of electricity." *Energy Policy* (2012); Jessoe, Katrina, and David Rapson, 2014. "Knowledge Is (Less) Power: Experimental Evidence from Residential Energy Use." *American Economic Review*, 104 (4): 1417-38.

<sup>3</sup> Savings chEhrhardt-Martinez, K., Donnelly, K. A., Laitner, J. A., 2010. "Advanced metering initiatives and residential feedback programs: A meta-review for household electricity-saving opportunities." Tech. Rep. E105, American Council for an Energy-Efficient Economy, Washington, DC.

<sup>4</sup> Foster, Ben and Susan Mazur-Stommen, 2012. "Results from Recent Real-Time Feedback Studies." Research Report B122. Washington, DC: American Council for an Energy-Efficient Economy.

E-access can help families and businesses understand their energy use in real-time or near-real-time, spurring the development and adoption of innovative technologies, products and services designed to help consumers take informed action to manage their consumption and reduce their electric bill. For the energy efficiency industry, e-access helps facilitate energy audits and benchmarking, and identify efficiency opportunities and retrofits. Access to data will also assist building energy programs to understand the cost-effectiveness of the measures installed and further advance their evaluation, measurement, and verification. Transparent energy information further can guide investments in and sizing of DER such as rooftop solar to maximize its return on investment for a home or business.

The Markey bill encourages the development of a consistent framework for energy usage data access. E-access can help states, regulators, utilities, consumer and privacy advocates, and third parties develop and implement data sharing policies and protocols that define what data should be made available, to whom, when and how, while safeguarding consumer privacy and security. Transparent, consistent, and predictable policies will overcome the obstacles innovative companies are facing as they try to navigate our nation's fragmented electric system to provide business models that deliver benefits to consumers and the electric grid alike.

**Testimony for the Record**  
**the Federal Performance Contracting Coalition (FPCC)**  
**For the Senate Energy and Natural Resources Committee**  
**“Hearing on Energy Efficiency Legislation”, April 30, 2015**

The FPCC would like to testify in favor of several of the bills listed for today’s hearing specifically S. 858, the Energy Savings Through Public-Private Partnerships Act of 2015. We will also discuss some areas of improvement in several bills.

The Federal Performance Contracting Coalition (FPCC), is a national industry coalition comprised of Energy Service Companies advocating for increased Federal use of Energy Savings Performance Contracts (ESPCs). Our coalition focuses exclusively on federal use of ESPCs and has spent time over the last sixteen years removing congressional and administrative barriers to usage, extending necessary authorities, educating about ESPCs and otherwise encouraging their use as a means for saving the government money on both energy and infrastructure. We have worked closely with several members of this Committee over the past few years to advance Federal use of ESPCs.

FPCC members have delivered approximately 95 percent of Federal Energy Savings Performance Contracts. This coalition is comprised of companies such as Ameresco, Constellation Energy, Energy Systems Group, Honeywell, Johnson Controls, Lockheed Martin, Noresco, Schneider Electric, Siemens Government Technologies and Trane/Ingersoll Rand.

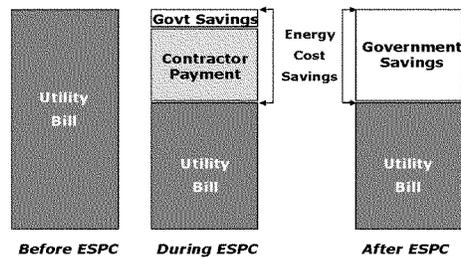
**Background: Energy Savings Performance Contracting**

As the nation’s single largest energy consumer, the Federal government spends more than \$7 billion annually on facility energy costs. Energy efficiency improvements can reduce this expenditure and help agencies acquire necessary infrastructure and equipment. In 2007, the Energy Independence and Security Act required federal agencies to perform

energy audits of their facilities. With only half of the buildings audited in 2013, approximately \$9 billion worth of energy conservation measures with a ten year payback or less had been identified. There is clearly a vast opportunity for energy efficiency across the Federal government at a time of reduced discretionary funding.

ESPCs and Utility Energy Service Contracts (UESCs) can fill this funding gap. For more than 20 years, performance-based contracts for energy savings have provided critical upgrades to federal buildings, including the House and Senate Office Buildings and the U.S. Capitol.

How do ESPC's work?



Under ESPCs and UESCs, private-sector Energy Service Companies finance and install new energy efficient equipment at no upfront cost to the federal government. Federal agencies repay this investment over time with funds saved on utility costs. The private sector contractors measure, verify and guarantee these energy savings. Private-sector financiers provide the capital, which today is available at historically low interest rates. By law, and on a negotiated basis, the government never pays more than it would have paid for utilities if it had not entered into an ESPC. In fact, a June 2013 Oak Ridge National Laboratory study found that under ESPCs, federal agencies are saving an average of nearly twice the amount of energy as is guaranteed by the contractors. ESPC retrofits also address

years of deferred maintenance at federal facilities at no additional cost to taxpayers. For these reasons, ESPCs have proven to be a highly successful tool to implement comprehensive energy efficiency projects.

Using an ESPC or UESC in the Federal government eliminates the need for appropriated dollars for equipment replacement and for operations and maintenance of the energy using equipment. According to the Federal Energy Management Program (FEMP), approximately 600 performance contracts worth \$5.3 billion have been awarded throughout 25 Federal agencies and in 49 states. These projects have resulted in energy savings valued at \$13.1 billion, of which approximately \$10.1 billion went to repay project investments, accruing a net savings of \$3 billion to the federal government.

President Obama announced a Directive ordering federal agencies to enter into \$2 billion worth of performance-based contracting for energy savings over a two year period. After hearing from 179 Members of Congress and Senators, led by the Energy Savings Performance Caucus, he extended that commitment to \$4 billion over five years. The Caucus, chaired by Representatives Kinzinger and Welch has been tireless in supporting Federal ESPCs, by supporting positive administration efforts, legislative barrier removal and efforts to addresses differences between the Office of Management and Budget and the Congressional Budget Office in scoring ESPC provisions.

#### **Fort Bliss ESPC Example**

Let me take a moment to provide an example of an ESPC and its benefits. One of our members, Johnson Controls has been helping Fort Bliss, one of the U.S. Department of Defense's largest military installations, become more energy efficient and secure. Through our ESPC work at Fort Bliss in El Paso, Texas, we have invested over \$100 million dollars in private sector capitol for energy efficiency improvements to:

- Update utility monitoring and controls systems to manage energy use in 120 buildings;
- Upgrade to energy efficient lighting;
- Replace electric motors;
- Install a new reciprocating chiller and solar thermal water heating technologies;
- Improve building insulation;
- Develop a program to reduce electricity during peak demand periods; and
- Install 4.75 megawatt of photovoltaic arrays consisting of 5,500 solar panels.

These and other initiatives will help the base save \$150 million over 20 years.

We are also working with the installation on technology for a microgrid to maintain critical loads in the event of an adverse occurrence on the grid. All of this is part of the Army's Net Zero energy initiative at Fort Bliss.

B.J. Tomlinson, renewable energy and sustainable engineering program manager at Fort Bliss, sums it up this way: "Improving a building envelope, reducing load and demand footprint, and producing renewable, sustainable energy save money to be sure. But the greener you make your buildings, and the more resilient they become closes the gap between what the grid provides and what you need to operate independently of the grid."

This is just one example of many ESPCs that provide multiple benefits to Federal agencies and taxpayers. Now I would like to address several provisions included in the discussion draft.

#### **Legislative Discussion**

##### **Energy Savings Through Public-Private Partnerships Act of 2015 (S.858)**

S.858, introduced by Senators Gardner, Coons, Portman and Shaheen will help ensure that federal agencies are utilizing to the fullest extent possible all cost-effective

measures for energy conservation. Identical legislation was introduced in the House by Representatives Adam Kinzinger (R-IL) and Peter Welch (D-VT). Last spring, the Energy Savings Through Public-Private Partnerships Act of 2014 was approved by the Energy and Commerce Committee of the House.

The legislation promotes transparency and accountability across the federal government, clarifies the ESPC statute, and will further enable federal agencies to maximize their present energy efficiency contracting authorities. The legislation streamlines the ESPC statute providing consistency and clarification within the existing ESPC law to:

- Require a report to Congress on the status of each agency's energy-related performance contracts, the value of these contracts for the previous year, the goal for the coming year, and an explanation by the agency about why goals were or were not met;
- For projects discovered in the energy audits required by section 432 of EISA 2007, agencies must explain why any life cycle cost effective measures were not implemented using U.S. Department of Energy developed guidelines. *This will encourage agencies to act on their mandated audits and can, because of the resolution of the scoring issue in the Senate, be modified to ensure agencies act on cost effective efficiency projects discovered in their federally mandated audits.*
- Clarify that agencies cannot arbitrarily limit use of energy-related operations and maintenance savings in an ESPC, a provision that will facilitate use of ESPCs for data center consolidation;
- Make consistent the definition of a federal building within federal energy provisions of law;
- Clarify in federal energy statute that plug loads are allowable energy conservation measures, another provision to clarify use of ESPCs for data centers; and

- Clarify as energy savings the use, sale or transfer of energy incentives, rebates, or credits (including Renewable Energy Credits) from federal, state, local governments or utilities and any revenue generated from a reduction in energy use; more efficient waste recycling; or more energy generated from more efficient equipment.

As mentioned previously, this bill passed the Energy and Commerce Committee last year.

#### **Energy Efficient Government Technology Act (Part of S.720)**

This bill, which encourages the Federal government to harness information technologies and data centers for improved energy performance and efficiency, also passed the Committee last year. Among other things, it clarifies the use of ESPCs for efficiency gains in data centers, which are extremely energy intensive. ESPCs can reduce that energy use by upwards of 75%-- all paid for from energy savings alone.

#### **Repeal Federal Building Fossil Fuel Reductions (S.869 and in S.720)**

We are supportive of this repeal, packaged together with extended energy efficiency goals for the government, which currently expire at the end of this year. This bill, introduced by Senator Hoeven, replaces the fossil fuel reduction mandate (433 of EISA) with several federal energy efficiency provisions that would further encourage and utilize energy savings performance contracting. The FPCC was involved in negotiating this package. In light of the recent Budget Resolution resolution of the CBO Scoring of ESPCs, *we would recommend that the energy efficiency goals of the Federal government could be extended beyond the 2 years currently in the bill. These goals currently expire at the end of 2015.*

#### **Alternatively fueled vehicle Fleets and Infrastructure (S. 1053)**

We support this bill introduced by Senator Franken that expands the use of ESPCs to acquisition of alternatively fueled vehicles and their infrastructure. A similar provisions was in an older version of Shaheen Portman and was deleted only because of the score associated. *Resolution of the scoring issue through the Budget Resolution allows the Committee to act on this bill.*

#### **Utility Energy Service Contract Improvement Act (S.723)**

We support long term Utility Energy Service Contracts that include measurement and verification of the energy savings, as well as either a guarantee of savings or assurances thereof. This ensures that the Federal government will achieve intended energy and cost savings.

#### **Other Important Provisions that should be considered**

There are some additional pieces of legislation that are being considered by various members of Congress and which we would wholeheartedly support. These include:

- Changing “may” to “shall” in EISA 432, as mentioned above;
- Long term extension of energy efficiency goals of the federal government, which have been in statute for over a decade and expire at the end of this year and also mentioned above;
- Ensuring that agencies set ESPC specific goals each year and report on their progress, which can be easily added to S.858 now that the scoring has been resolved for ESPCs; and
- Add alternatively fueled vehicles and their infrastructure to allowable measures under energy savings performance contracting (ESPCs), again, as mentioned above.

#### **Scoring of ESPCs**

As many of you are well aware, Energy Savings Performance Contracting has triggered a Congressional Budget Office (CBO) score since 2002 whenever Congress attempts to update the underlying ESPC statutory authority or generally legislate for federal energy efficiency. This scoring situation stalled last year's House version of S.858 and we very much appreciate all the help from members of the Energy and Natural Resources Committee who worked to address scoring in the Senate. Special thanks to Senators Gardner, Portman, Shaheen and Wyden.

We encourage you to continue to pursue annualized scoring for ESPCs in the House of Representatives.

In summary, ESPCs are private sector financing mechanisms that allow the federal government to increase its energy efficiency, decrease their energy costs without upfront appropriations and address deferred maintenance. Most importantly, the savings are guaranteed by the contractors. These contracts have delivered more than \$7 billion in energy related savings to the Federal government alone and significant additional opportunities abound. Passage of the Energy Savings Through Public-Private Partnerships Act of 2015 is key in supporting the ability of federal agencies to leverage the private sector for energy savings without relying on appropriated funds.

***Please direct any questions to Jennifer Schafer, Executive Director of the Federal Performance Contracting Coalition at 202-554-5828.***



## Geothermal Exchange Organization

312 South 4<sup>th</sup> Street • Springfield, IL 62701

Douglas A. Dougherty • President and Chief Executive Officer

**Statement for the Record from Douglas A. Dougherty  
President and CEO, Geothermal Exchange Organization  
For the Senate Natural Resources and Energy Committee  
Hearing on Energy Efficiency Legislation - April 30, 2015**

The Geothermal Exchange Organization (GEO), the trade association for the U.S. Geothermal Heat Pump Industry, thanks the Senate Energy and Natural Resources Committee for this opportunity to address what we believe is—and should be—an integral part of the national discussion on energy efficiency and renewable energy for the future of America.

Even though geothermal heat pumps have been deemed by the U.S. Environmental Protection Agency as the most efficient heating and cooling technology available, the technology is too often ignored when federal agencies seek to improve the efficiency of their buildings. The problem was exacerbated when thermal energy was left out of the definition of clean and renewable energy options to meet federal purchase mandates under Sec. 203 of the Energy Policy Act of 2005.

The Administration recently offered a partial remedy to the situation when they specifically included geothermal heat pumps in the President's recent Executive Order – Planning for Federal Sustainability in the Next Decade (March 19, 2015) under its definition of renewable electric energy as defined in Sec. 19(v) of the Order:

*“Renewable electric energy” means energy produced by solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, **geothermal heat pumps**, microturbines, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project.*

GEO is encouraged by this recent action, and urges the Committee to harmonize the conflicting definition by adopting the same or similar approach in an amendment related to federal energy purchases within the broad package of energy efficiency and other measures that you are now considering.

Not only would legislated adoption of a definition of clean energy that includes the thermal energy of geothermal heat pumps add a viable option for federal agencies seeking greater adoption of clean energy for cost savings and pollution abatement, it would set an example for the States that the technology should be a logical first choice for their facilities as well.

We appreciate the opportunity to provide comment and welcome your requests for any clarification and information you may need during your deliberations. Thank you again for the opportunity to provide comment.

Phone (217) 414-0341

Email [Doug@geoexchange.org](mailto:Doug@geoexchange.org)

Website [www.geoexchange.org](http://www.geoexchange.org)

**Testimony of Bill Rodgers, President and CEO of GoodCents Holdings, Inc.  
Senate Energy and Natural Resources Committee  
May 20, 2015**

*Chairman Murkowski, Ranking Member Cantwell and Members of the Committee:*

Thank you for the opportunity to provide testimony to the committee on S.703- reauthorizing the Weatherization Assistance Program. On Behalf of GoodCents, Inc., headquartered in Atlanta, Georgia, we thank you for your interest in this important program and for your leadership in assembling comprehensive energy efficiency legislation. GoodCents has operations in 22 states as well as Canada delivering over 85 energy efficiency programs. Our company has been in existence for over 34 years, and has provided multiple types of Demand Side Management and Energy Efficiency programs to over 150 Utilities, including Investor-Owned, Co-operatives and Municipalities. We have over 350 employees located across North America who wake up each and every morning focused on helping both residents and businesses reduce costs by utilizing energy in a more efficient manner.

Our company partners with both electric and gas utilities to deliver the most effective programs targeted at reducing their energy footprint. Some of the programs we deliver are:

- Facility Audits (both residential and commercial)
- Income Qualified Weatherization
- Residential and Commercial Rebate Programs
  - Trade Ally Network development and management
- Equipment Efficiency Studies
- Retrofit Programs for Commercial and Industrial
  - Lighting
  - H.V.A.C.
- Equipment Energy End-Use Studies

Our involvement covers the full spectrum of services: From initial program design, focused on the delivery of required or targeted savings; to the critical marketing services which drive customer education and program enrollments; to field implementation; and lastly, the

measurement and verification of the program's actual savings which are reported back to the respective regulatory body.

Through the work we have done and continue to do across the country we have learned valuable lessons that allow our programs to succeed. Our work on income qualified weatherization programs in particular has provided us insight which we believe can assist in reconstituting the weatherization assistance program to ensure a quantifiable return on investment for the American taxpayer. Specifically, we believe there are four areas that require immediate attention: reporting with measurement and verification of energy savings, consumer outreach and education, the establishment of a rural assistance program and finally allowing market driven energy efficiency companies like Good Cents to be part of the overall strategy.

#### **Driving Program Success**

Through our years of experience implementing energy efficiency programs we have found that program success is driven primarily by two factors; first **Is the program designed to achieve savings and** Is it effectively marketed and implemented to reach out to customers to engage, educate and ultimately drive participation?

In the case of the Weatherization Assistance Program we find neither of these factors have been sufficiently addressed and have likely given rise to the well documented problems the program has experienced in recent years.

#### **Customer Engagement and Participation**

Through years of work on market driven programs, GoodCents has identified a variety of tools that are effective in engaging customers and changing their behavior, resulting in optimal program enrollment. The key to a program's success is establishing a strong marketing campaign that spans multiple channels and provides multiple touches to customers to increase both awareness and program participation. In addition, it is essential to develop an enrollment channel that is easy and convenient for customers to use.

Effective marketing is the key to robust participation. GoodCents utilizes a complete array of marketing capabilities including print collateral design and production, social marketing programs (community engagement programs, social media implementation, local enrichment programs, etc.), and electronic communications to include website development, landing pages, email campaigns, and online program administration. In many programs, incentives are used to drive higher response rates through direct mail, trade ally networks, and community enrichment.

GoodCents also works to establish program awareness through social marketing platforms and pushes to engage local newspapers and media channels for additional support. In addition, we leverage social media resources such as Facebook, Twitter, and YouTube to raise awareness of energy efficiency and demand response programs. GoodCents works to build a program webpage that provides critical information and allows the customers to easily enroll. In addition, we leverage program marketing approaches with many of the Utility's current and future media campaigns or marketing efforts.

When working within the energy efficiency business the key to gaining customer acceptance is in educating them to the benefits of the programs, allowing them to understand the financial impact and return on investment, and working to make the participation process simple. This core element has been missing from previous iterations of the weatherization assistance program and must be included if the program is to succeed moving forward. Beginning with the program design phase, the weatherization program must utilize targeted consumer outreach, not only to ensure program deployment but also to ensure a broad consumer education process on how best to take advantage of improvements made.

**Reporting with Measurement and Verification:**

The goals of the Weatherization Assistance Program must ultimately be to provide an avenue to reduce energy and demand requirements, save money on electric bills, and meet energy reduction goals set forth in the program. However, just as utilities demand proof of energy savings to justify costs included in rate structures so too must the weatherization assistance program demand measurement and verification of actual energy savings, not just of the number of homes weatherized, in order to justify tax dollars spent on the program.

GoodCents believes that on-site energy assessments provide the best opportunity to reshape the energy usage habits of all customers, for both Income-Qualified Weatherization and Home Energy Assessment programs. Our highly trained and experienced advisors perform detailed site surveys and work closely with the customer to install energy efficiency measures as determined by the Utility and their customers. Our program delivery may include combustion safety testing, blower door guided air sealing, arranging for improved attic insulation, providing conservation education, and encouraging adoption of energy efficiency measures.

Along with installing measures, we are also capable and equipped to conduct in-out testing for implementation-style assessments such as weatherization, duct repairs, ceiling insulation and more. We are then able to educate the homeowner on the most impactful improvements they can make to their home to increase efficiency.

Our efforts do not stop after assessments and upgrades. Through targeted audits, advanced metering, and a review of consumer energy use, GoodCents is able to track and demonstrate energy savings. Perhaps the most critical element of measurement and verification is the establishment of common standards and reporting for success. Once these goals, standards, and reports have been set affected parties can then develop the proper alignment between the state, regulators, local communities, Utilities, industrial and commercial businesses and residential customers to drive towards their goals. This allows for the best thinking to be put towards the market-based program requirements versus establishing federal prescriptive programs that become difficult to realize ultimate success. These structures allow for a standard and common measurement system that drives the most consistent and clear understanding of the return on investment and energy impact.

#### **Rural Weatherization Assistance Network**

Through the work that GoodCents has done running state wide programs we have come to understand an important reality; that while the greatest opportunity for energy savings may exist in large cities where programs and marketing can be supported by big box retailers, there are rural communities around the country where residents similarly struggle with high electric bills but are not provided the resources to reduce them. Should the weatherization program move into the next phase of its operation it is important that the needs of these communities are addressed

through the establishment of a Rural Weatherization Assistance Network. This network focused on rural and tribal communities, must move beyond annual assistance subsidies and focus on reducing overall energy use.

GoodCents has created numerous programs targeted specifically at rural communities. Utilizing local partners, just as we do in urban areas, we create a message, identify channels for its delivery, and perhaps most importantly establish a network of product and service providers who can meet program goals. The combined force of these efforts ensure that consumers are aware of the program, have a realistic opportunity to take advantage of it, and can have their energy bill reduced through participation.

The key to the success of these programs is utilizing local partners with local knowledge. As many rural and Native American communities have made have made strides in this direction, the establishment of a specific Rural Weatherization assistance program should be done in partnership with Tribal Governments, Alaska Native Corporations, and Native Hawaiian Corporations.

#### **Leveraging Experience of Industry Leaders**

The above testimony marks the 3<sup>rd</sup> time that GoodCents has had the opportunity to provide industry perspective to help improve efficiency and weatherization programs on the federal level. Perhaps one of the reasons why the WAP program in particular has experienced difficulties in recent years is because companies like ours have been prevented from actually participating in the design, development, and deployment of these programs. While we have significant experience and the proven ability to reduce energy use and verify saving we nonetheless have been precluded from assisting those communities most in need.

As the committee looks at ways to improve the program and ensure a return on investment for taxpayers you must necessarily consider allowing the demonstrated leaders in this field to partner with not-for-profits and community action programs towards these important goals. GoodCents routinely works with not-for-profits and community organizations on the deployment of state and utility driven weatherization program. By allowing companies like ours to combine our individual areas of expertise we not only have delivered demonstrated savings, but have also

allowed the creation of long term careers in the energy business rather than the short term employment regularly associated with the weatherization program.

At its core, efficiency is defined as the ratio of useful work performed versus the amount of effort expended. If the committee is truly interested in results, we would urge you to consider allowing recognized industry leaders to participate in some or all elements of the Weatherization Assistance Program thereby significantly increasing the amount of useful work performed per dollar expended.

**Summation**

Thank you for the opportunity to provide our perspective on the energy efficiency title currently being considered by the committee including reauthorization of the Weatherization Assistance Program. We look forward to working with you to enact meaningful legislation capable of reducing energy use and providing a return on investment to the American taxpayer. Should you have any questions or require additional information please feel free to contact me at [wrodgers@goodcents.com](mailto:wrodgers@goodcents.com)



*Habitat. We build.*

Statement for the Record

Hearing on Energy Efficiency Legislation  
The Committee on Energy and Natural Resources  
United States Senate  
April 30, 2015

Respectfully submitted by

Christopher Ptomey  
Director, Government Relations  
Habitat for Humanity International

Thank you, Chairman Murkowski and Ranking Member Cantwell, for convening today's important hearing on energy efficiency legislation before the Senate. Habitat for Humanity International particularly appreciates the opportunity to address the important role of residential energy efficiency in affordable homeownership and how nonprofit innovation can deliver residential energy efficiency improvements to the lower-income households for whom increased efficiency can provide the greatest benefits. Through its new construction and home repair programs, Habitat has demonstrated that residential energy efficiency offers untold potential for families through better savings and financial security, for individuals through improved health and safety, and for communities through enhanced job creation and improvement of their environment.

Habitat for Humanity's vision is a world where everyone has a decent place to live. Anchored by the conviction that housing provides a path out of poverty, Habitat has helped more than 5 million people since 1976 through home construction, rehabilitation and repairs, and by increasing access to improved shelter through products and services. Habitat also advocates to improve access to decent and affordable shelter and offers a variety of housing support services that enable families with limited means to make needed improvements on their homes as their time and resources allow. As a nonprofit Christian housing organization, Habitat works in more than 70 countries and has more than 1,400 local affiliates here in the United States.

GOVERNMENT RELATIONS AND ADVOCACY OFFICE: 1424 K Street NW, Suite 600 Washington, DC 20005

ADMINISTRATIVE HEADQUARTERS: 270 Peachtree St. NW, Suite 1300, Atlanta, GA 30303-1263 USA

INTERNATIONAL HEADQUARTERS: office 322 W. Lamer St., Americus, GA 31709, mail 121 Habitat St., Americus, GA 31709-3498 USA  
229-924-6935 toll free 800-422-4828 fax 229-928-8311 habitat.org



*Habitat. We build.*

Lower-income households face a significantly greater energy cost burden than middle-income households, spending 14.4% of their total income on energy expenses, as compared to an average of 4% for higher income households. All told, far too many Americans find themselves spending a total of 17 to 50 percent of their paychecks on utility costs, including energy, and are often forced to choose between keeping their lights on and homes heated or cooled with the seasons or purchasing medicine, food, and other basic necessities.

High energy costs can be a particularly difficult challenge for older Americans who live on fixed incomes and cannot afford to live in newer, more energy-efficient homes. Many in this population reside in older homes that lack adequate insulation and have antiquated appliances and heating and cooling systems that are both ineffective and expensive to operate.

As outlined in Habitat's 2015 Shelter Report, *Less is more: Transforming low-income communities through energy efficiency*, there are steps that the government and the private sector can take both individually and in partnership to improve lower-income communities' access to the benefits of energy efficiency. Energy efficiency retrofit interventions (e.g., adding insulation, tightening the building envelope, replacing inefficient HVAC systems) present an important – and cost-efficient – opportunity to leverage 21st century technologies and testing protocols to deliver permanent energy savings to existing homes. Such interventions would enable lower-income households, including those in older homes, to share in the energy efficiency benefits broadly enjoyed by higher-income households living in newer homes. A well-built, well-sealed and well-insulated home saves money on energy bills and lowers maintenance costs. In addition, an energy efficient home protects occupants' health by promoting indoor air quality. The 2015 Shelter Report is available online at <http://bit.ly/HFHSR2015>.

#### **The Connection between Residential Energy Efficiency and Successful Homeownership**

A home is not affordable if it is not energy efficient, healthy and durable throughout its life cycle. Habitat affiliates across the country have seen how energy efficiency upgrades reduce the risk of mortgage default not only by decreasing energy costs but by significantly reducing medical and maintenance expenses as well. As a result, the majority of Habitat's more than 1,400 U.S. affiliates build homes using top notch energy

GOVERNMENT RELATIONS AND ADVOCACY OFFICE: 1424 K Street NW, Suite 600 Washington, DC 20005

ADMINISTRATIVE HEADQUARTERS: 270 Peachtree St. NW, Suite 1300, Atlanta, GA 30303-1263 USA

INTERNATIONAL HEADQUARTERS: office 322 W. Lamar St., Americus, GA 31709, mail 121 Habitat St., Americus, GA 31709-3498 USA  
229-924-6935 toll free 800-422-4828 fax 229-928-8811 [habitat.org](http://habitat.org)



*Habitat. We build.*

efficient building products and practices and are leading the way in delivering residential energy efficiency in underserved single-family housing markets across the country. While Habitat is typically known for new construction, typically built to ENERGY STAR standards or more demanding efficiency guidelines, Habitat has expanded its model over the last 3 years to scale up the rehabilitation and repair of existing homes that are older, abandoned or foreclosed. Energy retrofits constitute a significant portion of these rehabilitation efforts.

Since 2011, Habitat has weatherized 900 homes nationwide and thirty-six Habitat affiliates in twenty-five states are currently weatherizing existing homes to improve their energy efficiency, and more are in the process of building the skillsets and systems required to undertake this important work. For example, in 2012, Habitat for Humanity Huron Valley in Ann Arbor, Michigan launched a critical repair and weatherization project through its neighborhood revitalization initiative to help families improve their homes and lower costs to help avoid foreclosure. Pre and post-project energy audits demonstrated that Habitat Huron Valley's twenty weatherization projects reduced air-infiltration by 25-50 percent and allowed each family to live more comfortably in their homes, save money on their utilities, and reduce their carbon footprints – wins for the family, the Habitat affiliate, and the community as a whole.

**Expanding Efficiency Across the Country through the Weatherization Enhancement, and Local Energy Efficiency Investment and Accountability Act (S.703)**

In order to strengthen and extend the local delivery of weatherization services to lower-income households, Habitat strongly supports the Weatherization Enhancement, and Local Energy Efficiency Investment and Accountability Act (S.703). This bill, sponsored by Senators Collins, Coons, Reed and Shaheen will reauthorize the State Energy Program (SEP) and the Weatherization Assistance Program (WAP) for another five years and enhance the impact of these programs by creating a new competitive, leveraged grant program for non-profits like Habitat for Humanity with established experience in energy efficiency projects.

WAP and SEP have long track records of success in meeting the energy efficiency needs of lower-income Americans. WAP assists lower-income families who lack the resources to make their homes safer, healthier, and more energy efficient. Since 1976, WAP has

GOVERNMENT RELATIONS AND ADVOCACY OFFICE: 1424 K Street NW, Suite 600 Washington, DC 20005

ADMINISTRATIVE HEADQUARTERS: 270 Peachtree St. NW, Suite 1309, Atlanta, GA 30309-1263 USA

INTERNATIONAL HEADQUARTERS: office 322 W. Lamar St., Americus, GA 31709, mail 121 Habitat St., Americus, GA 31709-3498 USA  
229-924-6935 toll free 800-422-4828 fax 229-928-6811 habitat.org



*Habitat. We build.*

funded energy efficiency upgrades in more than 7.4 million homes across the country, including more than 1 million homes in the last 4 years. According to the Department of Energy, WAP saves between \$250 and \$450 annually for twenty to thirty years in all units that are weatherized. Further, every dollar invested in the program returns \$1.80 in energy benefits.

Established 38 years ago, the State Energy Program (SEP) has initiatives in place in all 50 states plus the District of Columbia and U.S. territories. With SEP funds and the resources those funds leverage, State Energy Offices develop and manage strategic programs that support the private sector's efforts to increase energy efficiency, develop alternative energy sources, promote energy-related economic development, and mitigate the impact of energy emergencies.

As significant as the achievements of these two programs have been, there remain many areas in which programmatic results can be improved. The competitive grant program that S.703 authorizes would complement both the WAP and SEP programs by engaging national housing and energy nonprofits with a proven ability to deliver energy efficient residential upgrades and the ability to leverage significant private investment. This grant program will significantly increase the reach of limited federal resources; efficient use of federal monies will increase the number of families served.

In sum, Habitat believes that S.703 will strengthen federal energy assistance programs by reducing residential energy consumption, enhancing housing affordability, maximizing limited federal resources, and ensuring consistent quality standards across federal energy efficiency investments.

Thank you for your consideration of this important issue. Habitat looks forward to supporting the Committee's efforts to advance S.703 and deliver critical federal energy efficiency resources to our neighbors most in need.

####

GOVERNMENT RELATIONS AND ADVOCACY OFFICE: 1424 K Street NW, Suite 600 Washington, DC 20005

ADMINISTRATIVE HEADQUARTERS: 279 Peachtree St. NW, Suite 1300, Atlanta, GA 30303-1263 USA

INTERNATIONAL HEADQUARTERS: office 322 W. Lamer St., Americus, GA 31709, mail 121 Habitat St., Americus, GA 31709-3408 USA  
229-924-6935 toll free 800-422-4828 fax 229-928-8811 habitat.org



## Information Technology Industry Council

Statement for the Record  
of the  
Information Technology Industry Council (ITI)

For the  
Senate Energy and Natural Resource Committee  
Hearing on Energy Efficiency

April 30, 2015

The Information Technology Industry Council (ITI) appreciates and welcomes the Committee's consideration of policy measures to improve and enhance energy efficiency.

ITI is the global voice of the technology sector. The 60 companies ITI represents are leaders and innovators in the information and communications technology (ICT) sector, including in hardware, software, and services. These companies are committed to innovation, to developing the energy-efficient solutions demanded by our customers, and to helping drive sustainable economic growth and energy independence across our nation's economy. We believe the U.S. government can be a helpful partner in these efforts.

At the same time that the Committee was holding its Hearing, ITI was testifying at a parallel Hearing before the House Energy and Commerce Subcommittee on Energy and Power. Our testimony at that Hearing was devoted to our support for the "Energy Efficient Government Technology Act."

**"Energy Efficient Government Technology Act" (EEGTA).**

EEGTA was first introduced in February 2013, and last year easily passed the House of Representatives as Title III of H.R. 2126, the "Energy Efficiency Improvement Act of 2014." In the Senate, it was first introduced as S. 1261 by Senators Mark Udall (D-Co) and James Risch, and was later incorporated as Sections 301 and 303 of the "Energy Savings and Industrial Competitiveness Act." In this Congress, it has been reintroduced as H.R. 1268 by

Representatives Anna Eshoo (D\_CA) and Adam Kinzinger (R-III), has been incorporated as Sections 4111 and 4112 of the House Energy and Commerce Committee's Discussion Draft entitled, "Title IV Energy Efficiency and Accountability," and it also comprises Sections 301 and 303 of S. 720, the "Energy Savings and Industrial Competitiveness Act of 2015". With support from ITI and seven other prominent organizations, EEGTA builds on a rich, bipartisan energy efficiency tradition between ITI and the U.S. Congress.

As a quick recap, this tradition dates back to 2006 with the introduction and enactment of H.R. 5646, a bill requiring the EPA and DOE to analyze and report to Congress on the growth and energy consumption of federal government and private sector data centers. The bill's lead sponsors were Representatives Mike Rogers and Anna Eshoo, and the key supporting organization was ITI.

The report required by that bill was delivered to Congress in August 2007, and was entitled the "Report to Congress on Server and Data Center Efficiency Public Law 109-431." The report provided important information on data center energy usage and practices, as well as useful analysis of both the benefits and obstacles to greater energy efficiency in data centers. To this day, it remains the government study that is consistently referenced globally as concerns data center energy efficiency.

Based on that 2007 report, and with ITI leading in support, Congress passed a bipartisan provision within the Energy Independence and Security Act (EISA) that became Section 453 of PL 110-140. This provision established a voluntary national information program on data center energy efficiency and innovation, encouraging a strong partnership between the private sector and the federal government.

EEGTA builds on this foundation, supplying a meaningful update and reinvigoration to the requirements of Section 453 of EISA. The bill does not bring a regulatory approach to energy efficiency. Rather, it stresses voluntary partnership between the private sector and the federal

government, and it encourages greater federal government leadership in leveraging information and communications technology (ICT) for energy efficiency and productivity.

The gains in energy savings and productivity could be large. In a 2012 report, the Center for Climate and Energy Solutions estimated that widespread deployment of the kind of solutions that Section 2 of EEGTA is encouraging within the federal government “*could save an estimated \$5 billion in energy costs through 2020.*”

Section 2 of EEGTA recognizes that as the nation’s largest landlord, fleet operator, and purchaser of goods and services, the federal government has both the opportunity and responsibility to lead by example in leveraging ICT in moving the U.S. in a less costly, more sustainable direction. The importance of doing so will increase further as intelligent efficiency and the Internet of Things become more pervasive.

As regards Section 3 of EEGTA, this section focuses on improving the energy efficiency of federal data centers, including measures that will lay the groundwork for further private sector improvements in data center efficiency. It does so by building on work already being performed by the Department of Energy and key stakeholders as The Green Grid.

Section 3 not only builds on this work, it also captures ITI’s vision for the productive future of the partnership between the federal government and our industry. This future should include: an update to the 2007 Report to Congress; further work on specifications, measurements, and benchmarks, and in particular on a new data center utilization metric; use of the Data Center Energy Practitioner Program; and, increased sharing of best practices and open data.

ITI scores the bill as providing significant savings for the U.S. taxpayer – through reduced federal government energy use and through greater productivity per watt expended.

In sum, EEGTA would serve as a welcome non-regulatory boost to U.S. energy efficiency and to greater return on the U.S. taxpayer’s dollar, and ITI urges its rapid adoption.

**Other Energy Efficiency Legislation That ITI Strongly Supports.**

While ITI has taken the lead role in supporting EEGTA, the Committee Hearing included other legislation that ITI supports. All these bills leverage the massive benefits that Information and Communications Technology (ICT) can bring to our country's future energy efficiency and sustainable growth, and do so cost-effectively. In this regard, along with EEGTA and S. 720, we also particularly reference the following bills:

S. 858, from Senator Cory Gardner (R-CO), the "Energy Savings Through Public-Private Partnerships Act of 2015."

S. 886, from Senator Tom Udall (D-NM), the "Smart Energy and Water Efficiency Act of 2015."

S. 1044, from Senator Ed Markey (D-MA), the "Access to Consumer Energy Information Act."

S. 1046, from Senator Maria Cantwell (D-WA), a bill to accelerate the adoption of smart building technologies.

S. 1054, from Senator Jeanne Shaheen (D-NH), the "Smart Manufacturing Leadership Act of 2015."



April 29, 2015

United States Senate Committee on Energy and Natural Resources  
304 Dirksen Senate Building  
Washington, DC 20510

Re: Statement for the record of the Committee's hearing on energy efficiency legislation on April 30, 2015

To the Members of the U.S. Senate Committee on Energy and Natural Resources:

On behalf of the Institute for Market Transformation (IMT), please accept this statement for the record of the hearing on energy efficiency legislation scheduled on April 30, 2015, with regard to the Energy Savings and Industrial Competitiveness Act of 2015. We strongly urge the U.S. Senate to pass this important legislation.

IMT's mission is to engage in a process of strategic intervention in the market to bring about widespread permanent change. For IMT, this means creating the conditions for greater investment in energy-efficient buildings. We have been a national leader in advocating for the inclusion of energy efficiency in the real estate appraisal process, have published guides for commercial and multifamily real estate, undertaken numerous case studies, legislatively advocated for the inclusion in single family underwriting, and sponsored numerous appraisal training seminars throughout the country (see [imt.org/finance-and-real-estate](http://imt.org/finance-and-real-estate)).

We are pleased that the Energy Savings and Industrial Competitiveness Act of 2015 proposes the inclusion of energy costs in the underwriting process under Section 433: Enhanced Energy Efficiency Underwriting. This Section, otherwise known as the SAVE Act, would improve federal mortgage underwriting by including a home's expected energy cost savings when determining the value and affordability of energy-efficient homes. With no new government bureaucracy or cost to the current deficit, better information about a home's expected energy cost savings will:

- Enable better mortgage underwriting
- Reduce utility bills for American homeowners
- Spark job creation in the housing and manufacturing industries
- Provide affordable financing for home energy improvements



On average energy costs now exceed the cost of local property taxes and homeowners insurance and are a major element of affordability for borrowers. Adjusting the mortgage underwriting process to better reflect the benefits of an energy-efficient home would directly benefit American homeowners, prospective homebuyers, and the U.S. economy.

Homeowners are increasingly demanding energy efficiency. Many Americans have purchased energy-efficient new homes (over 1 million to date), or have improved their current home's efficiency, as indicated in a recent Harvard Joint Center report. And, a study by the National Association of Home Builders recently found that 90 percent of prospective homebuyers wanted energy efficiency features in their homes.

Energy efficiency is a significant factor in calculating the true cost of homeownership. High utility bills are a drain on both the American economy and homeowners' wallets. In this regard, energy efficiency can play an important role: A recent study by the Center for Community Capital of the University of North Carolina found that between 2002 and 2012, energy-rated properties were 32 percent less likely to default on their mortgages than comparable homes with comparable buyers. The money saved on lower utility bills can be better invested in the U.S. economy.

However, first-time home buyers and moderate-income borrowers have had difficulty affording the slight premium in cost for more-efficient homes, despite the fact that the monthly energy savings were much greater than the additional monthly mortgage cost. These borrowers often rely on federal government mortgage programs, which currently account for more than 90 percent of mortgage financing in the U.S. These programs, however, do not adequately recognize energy efficiency.

Many homeowners and homebuyers are not only prevented from reaping the benefits of purchasing and owning an energy-efficient home, but the country as a whole is also missing out on 83,000 net new jobs that could be created by building new energy-efficient homes and retrofitting existing homes. The SAVE Act, as Section 433 of the Energy Savings and Industrial Competitiveness Act of 2015, is an important step toward addressing these current market failures.

The SAVE Act does not add to the current deficit or rely on taxes or fees; instead it removes current obstacles holding back more-efficient building and remodeling of U.S. homes. It is supported by a broad and diverse coalition of supporters representing American business, such as BASF, DOW, the National Association of Manufacturers, and the U.S. Chamber of Commerce.



It is time for the U.S. Senate to support this legislation and move forward in making the U.S. housing stock more energy efficient, lowering consumer utility costs, reducing our dependence on foreign oil, and driving the creation of more jobs in American trade and manufacturing industries.

Sincerely,

A handwritten signature in black ink that reads "Cliff Majersik". The signature is written in a cursive style.

Cliff Majersik  
Executive Director

**Statement for the Record: Energy Efficiency Hearing, April 30, 2015**  
**U.S. Senate Committee on Energy and Natural Resources**

**Submitted by Insulation Contractors Association of America**

The Insulation Contractors Association of America (ICAA) appreciates the opportunity to make this statement to the U.S. Senate Committee on Energy and Natural Resources about energy efficiency legislation.

The Insulation Contractors Association of America represents insulation contractors and manufacturers who work with all thermal insulations such as cellulose, fiberglass, and foam. The insulation materials with which we work are the most efficient and economical products available to reduce energy loss and conserve the valuable fuels used to heat and cool homes and commercial buildings. 40% of the nation's energy expenditure is spent on residential and commercial buildings.

The time is ripe for legislation to bolster energy efficiency and the preservation of natural resources. People of all ages, but particularly young people, support government action to curb energy use. From conserving energy to conserving the planet, suitable energy efficiency legislation is a big step forward to assist in preserving natural resources and is an important expression of responsible citizenship.

ICAA believes that insulation, a proven, least-expensive, and easiest-to-implement conservation option, is an important asset in the national campaign to enhance energy efficiency, reduce stress on the power grid, reduce greenhouse gas emissions, and preserve precious natural resources. Insulation is an American product. Insulation is manufactured, transported, and installed in America. Most insulation contracting companies in the United States are family-owned businesses.

As President Obama has said: "The country that leads in clean energy is also going to be the country that leads in the global economy." My colleagues in the insulation industry join me in urging Senate action to incentivize homeowners and developers to reduce energy loss through the installation of efficient and well-designed insulation.



The Jewish Federations®  
Washington D.C. Office OF NORTH AMERICA

THE STRENGTH OF A PEOPLE.  
THE POWER OF COMMUNITY.

April 30, 2015

Senator Lisa Murkowski  
U.S. Senate  
Chair, Energy and Natural Resources Committee  
Washington, D.C. 20510

Michael D. Siegal  
CHAIR, BOARD OF TRUSTEES  
Diane S. Feinberg  
CHAIR, EXECUTIVE COMMITTEE

Linda A. Hurwitz  
NATIONAL CAMPAIGN CHAIR

Ann Pava  
CHAIR, NATIONAL WOMEN'S  
PHILANTHROPY

Stephen J. Silverman  
TREASURER

Robert Kuchner  
ASSISTANT TREASURER

Cynthia Shapira  
SECRETARY

VICE CHAIRS  
Suzanne B. Grant  
Sheryl Kimberling  
Jodi J. Schwartz  
Mark Willif

COORDINATING COUNCIL  
Harvey J. Barnett

David T. Brown  
David J. Butler

Debra Jaffe-Berkowitz  
Beth Kaplan

Darren Lederline  
Richard N. Bernstein  
CHAIR, UIA

Gerald B. Silverman  
PRESIDENT/CEO

William C. Daroff  
SENIOR VICE PRESIDENT  
FOR PUBLIC POLICY &  
DIRECTOR OF THE  
WASHINGTON D.C. OFFICE

Senator Maria Cantwell  
U.S. Senate  
Ranking Member, Energy and Natural Resources Committee  
Washington, D.C. 20510

Dear Senator Murkowski and Senator Cantwell:

On behalf of the Jewish Federations of North America, the national organization representing and serving over 150 Jewish federations, their affiliated Jewish community foundations and 300 independent Jewish communities in more than 800 cities and towns across North America, I thank you for your consideration of S. 600, the bipartisan "Nonprofit Energy Efficiency Act" and urge you to pass this important legislation.

The Nonprofit Energy Efficiency Act would enable America's schools, youth centers, houses of worship, hospitals, museums, and other charitable organizations to reduce their operating costs, lessen impact on the environment and bolster America's energy independence.

Many of the energy efficiency support programs currently in existence are structured in the form of tax credits and rebates. Charities—as tax-exempt entities—have not been able to take advantage of these programs. Moreover, charities, as nonprofit organizations, are often least able to surmount the "front end" investment cost of energy efficiency retrofits.

America's charities serve their unique constituencies as well as the community at large. The passage of S. 600 would enable these organizations to strengthen the energy efficiency of their existing buildings and devote a larger portion of their operating budget to provide valuable services.

We ask that you, as leaders of the Senate Committee on Energy & Natural Resources, support this bipartisan legislation.

Sincerely yours,

William C. Daroff  
Senior Vice President for Public Policy &  
Director of the Washington Office



1455 Pennsylvania Ave NW, Suite 400 • Washington, DC 20004  
(202) 621-1815 • [www.leadingbuildersofamerica.org](http://www.leadingbuildersofamerica.org)

---

April 30, 2015

**STATEMENT OF KENNETH GEAR, CEO  
LEADING BUILDERS OF AMERICA  
BEFORE  
THE U.S. SENATE  
COMMITTEE ON ENERGY AND NATURAL RESOURCES  
“ENERGY EFFICIENCY LEGISLATION AND THE SAVE ACT”  
April 30, 2015**

Thank you for the opportunity to express the views of Leading Builders of America (LBA) regarding energy efficiency and the Sensible Accounting to Value Energy (“SAVE Act”) provisions of S. 720 (Portman-Shaheen).

LBA commends Chairman Murkowski and Ranking Member Cantwell for exploring ways to improve energy efficiency in this country and removing barriers to achieving further improvements in energy efficient building. LBA member companies are convinced that the SAVE Act is the most impactful efficiency provision under consideration by Congress. It will remove barriers to building more efficient homes and bring new and innovative products to market all while saving homeowners money on their utility bills.

Leading Builders of America is a trade association representing 21 of the largest homebuilders in the nation. In 2013, our members built more than 132,000 homes in thirty-four states accounting for nearly one-third of the new homes sold in the U.S.

LBA member companies are building green homes every day throughout the country and are active participants in voluntary energy efficiency programs like Energy Star, Builders Challenge, Environments for Living and other green building programs and are committed to building an energy-efficient future. Our members are on the front lines of this effort and recognize the important role that housing can play

in reducing energy consumption in the United States. However, there are barriers to building the highly efficient homes that homebuyers want and deserve.

**A. SAVE ACT IS CRITICAL (§433 of S.720).**

A prospective homebuyer considering an energy efficient home should be in a win-win situation. An energy efficient home is good for the environment, cheaper to own, and more comfortable to live in. However, while today's homebuyer values the energy efficient features available in new homes, the mortgage underwriting and appraisal process administered by the federal government does not allow homeowners to properly value or finance those features. LBA believes that providing tools to help homebuyers finance energy efficiency features, and ensuring that those features are properly valued in appraisals, must be at the heart of any legislation aimed at reducing energy consumption in homes. The good news is that these improvements can be made quickly and without a taxpayer subsidy or hidden tax on consumers. The only action required is to update existing mortgage underwriting rules. See, The SAVE Act (§433 of S.720).

Enacting the SAVE Act will:

- 1) Increase the energy efficiency of new and retrofit homes
- 2) Significantly reduce homeowners' monthly utility bills
- 3) Spark innovation and job creation by US manufacturers of energy efficient products
- 4) Increase the accuracy and transparency of mortgage underwriting
- 5) Create a voluntary program without a new government bureaucracy
- 6) Boost the homebuilding and manufacturing industries

1. **Market Based Energy Efficiency:** Currently over 90% of the mortgages originated in the U.S. are through Federal Government entities such as FHA, VA, Fannie Mae and Freddie Mac. Their underwriting standards and processes have not kept pace with significant shifts in consumer costs and building technology. The private sector is delivering more energy efficient homes and cost effective technology, but changes to federal mortgage processes are needed to make it more widely available to working and middle income Americans. The SAVE Act will provide the policy guidance needed to overcome bureaucratic inertia.

2. **Consumer Benefits:** The SAVE Act will save money for borrowers by creating a more transparent and predictable mortgage market, with lower default rates, which means lower costs for everyone. Just

as importantly, buyers are incentivized to purchase energy efficient homes because the savings are recognized in their borrowing ability, even as they reduce their monthly energy bills.

3. **Promotes Manufacturing:** Most products that go into new homes are made right here in the US, but product manufacturers who are continually developing new technologies, are finding that builders cannot use these new products because the incremental cost in most cases cannot be financed as part of a buyer's mortgage. Passing the SAVE Act will unlock manufacturing demand for these innovative new products and significantly reduce homeowner's utility bills. A classic win-win.

4. **Transparency:** The SAVE Act increases transparency and accuracy in residential mortgage underwriting. By recognizing energy costs, which are generally more than taxes or insurance, the risk in a mortgage loan will be clearer and the risk of default, therefore, is reduced.

5. **Voluntary:** The SAVE Act will reduce energy consumption with market mechanisms, not more government regulation or ill-conceived subsidies. By recognizing the reality – and the benefits – of lower energy costs, buyers have an incentive to buy, and builders have an incentive to build, energy efficient homes. Over one-quarter of US energy consumption is generated at the household level and the savings will be significant. This can be accomplished with no government subsidies, no new bureaucracies and no hidden taxes on consumers. The program can operate within existing government programs without any significant administrative costs.

6. **Boosts our Economy:** The SAVE Act will boost jobs and the economy. As any American motorist can attest, lower energy costs translate into more disposable income to spend or invest. That helps everyone. At the same time, the residential housing and manufacturing industries, major job providers, will get a shot in the arm with more credit-worthy buyers participating in a rapidly growing segment of the market.

#### **B. Energy Star Program**

The LBA also supports passage of The Energy Star Program Integrity Act (HR 504/ S 1038). LBA member companies are innovators in energy efficient residential construction and have been active participants in the federal government's ENERGY STAR program. The LBA supports legislation like *The Energy Star Program Integrity Act* that stimulate economic growth, spur innovation, protect the environment, and promote energy efficiency. ENERGY STAR is a popular federal program that encourages companies in a

wide variety of industries to voluntarily invest in the development of energy efficient technology, reducing energy consumption and growing the economy. Wide participation in the program, however, could be threatened by a recent trend of lawsuits against ENERGY STAR Partners after a product is disqualified.

Reduced participation in the ENERGY STAR program would be a step backward for the promotion of energy efficient technologies. The *Energy Star Program Integrity Act* would maintain the administrative and enforcement roles of the Department of Energy and Environmental Protection Agency, deter unnecessary lawsuits, and ensure continued participation in the ENERGY STAR program from producers and consumers alike.

###

Statement of Senator Edward J. Markey (D-Mass.)  
On S. 1044, the E-access Act  
Committee on Energy and Natural Resources  
Hearing on Energy Efficiency Legislation  
April 30, 2015

I commend Chairman Murkowski and Ranking Member Cantwell for holding this important hearing on energy efficiency legislation and thank them for including legislation that I have introduced, S. 1044, the E-access Act, as part of the hearing.

S. 1044 would provide incentives for states and utilities to adopt policies to provide consumers with access to their electricity information. It would help make sure that consumers can access their own electricity data so that they can save energy.

Consumers can make better decisions when they have access to information. Americans use information about gasoline prices and car mileage to understand the impact of driving on their pocket books and to manage their vehicle purchases. But when it comes to electricity consumption, many consumers lack access to basic information about the energy usage in their own homes and businesses.

We're heading towards a world where consumers will be able to actively manage their home thermostats, their appliances, and their lighting schemes to conserve energy and reduce their electricity bills. They'll be able to do it all from their smart phones. But like all things in the Information Age, it depends on data. It requires that consumers have access to the data coming off their smart meters. That's what my bill would do. It would empower consumers to use information in innovative ways to make better decisions. And my bill would also ensure that we build in the privacy protections for consumers for their information.

The E-access bill would be a win for consumers and a win for the innovators developing the apps, web platforms, and appliances that are building the smart grid, creating jobs and empowering consumers.

This legislation has the support of groups like the Alliance to Save Energy, Efficiency First, the Information Technology Industry Council, and the Silicon Valley Leadership Group.

It has the support of major companies developing smart grid applications like EnerNOC, and Schneider Electric.

It has the support of real estate development groups like the Real Estate Roundtable.

I commend Chairman Murkowski and Ranking Member Cantwell for their bipartisan commitment to advancing energy efficiency legislation and look forward to working with my colleagues on both sides of the aisle to move this legislation forward. Thank you.



April 30, 2015

The Honorable Lisa Murkowski  
 Chairman, Committee on Energy  
 and Natural Resources  
 304 Dirksen Senate Office Building  
 United States Senate  
 Washington, DC 20510

The Honorable Maria Cantwell  
 Ranking Member, Committee on  
 Energy and Natural Resources  
 304 Dirksen Senate Office Building  
 United States Senate  
 Washington, DC 20510

Re: Support for "The Energy Savings and Industrial Competitiveness Act of 2015"

Dear Chairman Murkowski and Ranking Member Cantwell:

On behalf of NAIOP, the Commercial Real Estate Development Association, I write to express our strong support for "The Energy Savings and Industrial Competitiveness Act of 2015," introduced by Senators Rob Portman (R-OH) and Jeanne Shaheen (D-NH).

NAIOP is the leading organization for developers, owners, investors and related professionals in office, industrial, retail and mixed-use real estate, and comprises 16,000 members and 48 local chapters throughout the United States.

We have worked with staff for a number of years on this issue, and we commend Senators Portman and Shaheen for facilitating the numerous discussions that took place with a variety of stakeholders. The latest version of this bill reflects a balanced approach that provides common sense solutions for promoting energy efficiency in buildings.

NAIOP maintains that in order to create responsible building codes, economic feasibility and initial costs need to be considered with a realistic pay-back to the developer in order for energy efficiency gains to be viable. This legislation ensures that the Department of Energy will consider these paybacks as they develop efficiency targets. This aligns the advancement of energy efficiency with the economics of real estate development.

We are grateful for the opportunity to represent the interests of the commercial real estate industry throughout this process and feel strongly that this legislative approach is the best way for the federal government to promote energy efficiency in the built environment.

Thank you for your commitment to this important issue and we look forward to working with the committee to advance this important legislation.

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas J. Bisacchino". The signature is fluid and cursive, written over a light gray background.

Thomas J. Bisacchino  
 President and CEO

2201 Cooperative Way, Suite 300, Herndon, VA 20171-3034

Tel: (703) 904-7100

Fax: (703) 904-7942



June 24, 2015

The Honorable Lisa Murkowski  
 Chairman, Committee on Energy  
 and Natural Resources  
 304 Dirksen Senate Office Building  
 United States Senate  
 Washington, DC 20510

The Honorable Maria Cantwell  
 Ranking Member, Committee on  
 Energy and Natural Resources  
 304 Dirksen Senate Office Building  
 United States Senate  
 Washington, DC 20510

Re: Opposition Statement for S. 1052

Dear Chairman Murkowski and Ranking Member Cantwell:

On behalf of NAIOP, the Commercial Real Estate Development Association, I write to express our opposition to Senator Franken's energy benchmarking bill, S. 1052, which was considered during the April 30<sup>th</sup> committee hearing on energy efficiency legislation.

NAIOP is the leading organization for developers, owners, investors and related professionals in office, industrial, retail and mixed-use real estate, and comprises 17,000 members and 48 local chapters throughout the United States.

S. 1052 promotes what is commonly referred to as energy benchmarking, which requires building owners of commercial and multifamily properties to compare a building's energy usage to other buildings and make publically available either a "score" or at the very least how much energy a building consumes.

While several cities around the country has moved forward with these types of requirements, there is currently no data which suggests that disclosing a building's energy usage will have an impact on either occupancy behavior, or lead to an increase in energy efficiency for a building as a whole. What we have learned, however, is that by creating and disclosing a building's energy score, you can create misperceptions as to the ability of a building owner to affect tenant energy usage. As a result, lower benchmarking scores have the potential to unfairly devalue a building depending on the local market.

In fact, most of a building's energy use is directly related to tenant activity, which the building owners have no control over. It is unfair to stigmatize a building by giving it a low benchmark score if that building's tenants have high energy demands. For example, many buildings in downtown DC house doctor or dentist offices. These offices have high energy usage because of the equipment used to meet the health needs of their patients. High energy devices, such as X-ray machines and other diagnostic equipment, require significant energy inputs that could lead to a building being scored negatively from a benchmark standpoint.

Additionally, older buildings with similar occupancy energy demands as newer buildings will likely be scored lower because they were built in conformance with older building codes. If the intent of benchmarking is to encourage older properties to implement costly retrofits by shaming them with a low benchmarking score, a better route forward would be to offer grants for building owners to perform

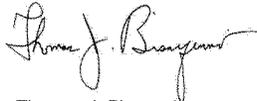
energy audits. These audits could be used to show what energy retrofits can be implemented as well as the return on investment.

Not all markets are created equal, and the costs that can be absorbed in certain areas are not cost effective in others. Tenant lease rates, energy costs and finance rates are the most important variables accounting for energy retrofit activities. Energy audits could show a building owner which upgrades provide for the most cost-effective improvement in energy efficiency. This aligns the advancement of energy efficiency with the economics of real estate development.

For these reasons, we feel strongly that this legislation could produce harmful results to the real estate industry. Thank you for your consideration of our views. We are grateful for the opportunity to represent the interests of our members during this process.

If I, or my office, can be of further help, please contact John Bryant, senior director of federal affairs, at [Bryant@naiop.org](mailto:Bryant@naiop.org) or 703-904-7100.

Sincerely,



Thomas J. Bisacchino  
President and CEO  
NAIOP

cc: The Honorable Al Franken



1615 M Street, NW, Suite 800  
Washington, DC 20036

Tel 202/822-0950  
Fax 202/822-0955  
<http://www.naesco.org>

April 30, 2015

The Honorable Lisa Murkowski  
Chairwoman, Committee on Energy  
and Natural Resources  
United States Senate

The Honorable Maria Cantwell  
Ranking Member, Committee on Energy  
and Natural Resources  
United States Senate

**Re: Statement for the Record on the April 30, 2015 Energy Efficiency Hearing**

Dear Senators Murkowski and Cantwell,

The National Association of Energy Service Companies (NAESCO) appreciates the opportunity to submit this Statement for the Record on a number of energy efficiency bills that the Committee will be considering at its April 30, 2105 hearing.

**Introduction to NAESCO**

NAESCO is the leading national trade association of the energy services industry. NAESCO numbers among its members some of the world's leading energy services companies, including: ABM Energy, AECOM Energy, Ameresco, CM3 Building Solutions, Clark Energy Group, ClearEnergy Contracting, Climatec, ConEdisonSolutions, Constellation Energy Projects, Control Technologies and Solutions, CTI Energy Services, Energy Solutions Professionals, Energy Systems Group, Excel Energy, The Fulcrum Group, Harshaw Trane, Indoor Environmental Services, NextEra Energy Solutions, Honeywell, Johnson Controls, Lockheed Martin, McClure Energy, Navitas, NORESKO, Onsite Energy, Opterra Energy Services, Pepco Energy Services, Performance Services, Schneider Electric, Siemens Industry, Southland Industries, Synergy Companies, Trane, UCONS, Wendel Energy Services, and Willdan Energy Solutions. Utility members include the New York Power Authority, Pacific Gas & Electric, and Southern California Edison.

Since the inception of the Department of Energy's energy savings performance contract (ESPC) in 1998, DOE has implemented 325 ESPC projects. Private companies have invested more than \$3.41 billion in Federal energy efficiency and renewable energy improvements, which have resulted in more than 398 trillion Btu life cycle energy savings and more than \$8.53 billion of cumulative energy cost savings for the Federal Government.<sup>1</sup> Since 1990, NAESCO member company projects have produced:

- \$50 billion in projects paid for with utility cost savings
- \$55 billion in savings – guaranteed and verified
- 450,000 person-years of direct employment
- \$33 billion of infrastructure improvements in public facilities
- 450 million tons of CO2 savings at no additional cost

**Summary of Statement**

NAESCO urges the Committee to support the provisions of the following bills, either by passing them as standalone measures, or incorporating the provisions into omnibus energy efficiency legislation. Our statement is not meant to imply that we do not support enactment of the other bills that the Committee is considering at its April 30 hearing, but rather that NAESCO is restricting its statement to legislation on which it and its members have significant experience and expertise. The bills that we support are:

- S. 723 - Utility Energy Service Contracts Improvement Act of 2015
- S. 858 - Energy Savings Through Public-Private Partnerships Act of 2015
- S. 869 - All-of-the-Above Federal Building Energy Conservation Act of 2015

Each of these bills has bi-partisan sponsorship and, we believe, substantial bi-partisan support in both houses of Congress.

**Discussion**

The purpose of each of these bills is to remove barriers to significantly increasing the energy efficiency of federal government facilities, which NAESCO believes should be the cornerstone of national policy on energy efficiency. Federal efforts to encourage increased energy efficiency state and local governments, homeowners, institutions and private buildings owners are much more convincing if they are based on the example of a federal government that is aggressively eliminating all utility waste in its facilities. Yet, according to a September 2013 report issued by the Lawrence Berkeley National Laboratory, nearly three-quarters federal facilities are still good candidates for comprehensive energy efficiency projects.<sup>2</sup> So despite much success, there is a considerable amount of energy efficiency work yet to be implemented at federal facilities.

In NAESCO's experience, the major barrier to increasing the energy efficiency of federal facilities is the resistance of federal bureaucracies. This resistance takes three principal forms, which are addressed by the three bills that NAESCO supports.

- Upgrading federal facilities with performance contracts, which re-purpose taxpayer funds currently spent on wasted energy into a payment stream for capital improvements, has been hampered in some federal agencies by legal interpretations that restrict the contract term of a Utility Energy Service Contract (UESC). S. 723 makes it clear to agency legal officers that the maximum term for a UESC is the same as the maximum term for an Energy Savings Performance Contract (ESPC), the other type of performance contract.
- Implementing an ESPC or UESC project is viewed by some federal agency facility managers as more risky than waiting for a future appropriation, which is unlikely in today's constrained fiscal environment, and which costs the taxpayers money every year that a project is delayed. S. 858 makes it clear to facility managers that waiting is not an option, by mandating that they identify all cost-effective potential retrofits, and then explain in an annual report why they have not implemented these retrofits.
- Continuously improving the operating efficiency of federal building operations is often more work for building operators than simply paying energy bills. S. 869

makes it clear to federal facility managers that implementing energy efficiency retrofits and monitoring the efficiency of building operations with commissioning are not voluntary activities, but a key part of their jobs going forward.

**Conclusion**

NAESCO therefore urges the Committee to support the provisions of S. 723, S. 858 and S. 869, either by passing them as standalone measures, or by incorporating the provisions into omnibus energy efficiency legislation. Each of these bills has bi-partisan sponsorship and, we believe, substantial bi-partisan support in both houses of Congress. Each of these bills will deliver substantial value to taxpayers, by curtailing the waste of energy in government facilities, and encouraging the re-purposing of taxpayer funds currently spent on wasted energy to pay for energy efficiency improvements in federal facilities.

Sincerely,



Donald Gilligan  
President

---

<sup>1</sup> Source: Federal Energy Management Program

<sup>2</sup> *Current Size and Remaining Market Potential of the Energy Service Company Industry*, Environmental Energy Technologies Division, Lawrence Berkeley Laboratory, Elizabeth Stuart *et al.*



**Ross Eisenberg**  
*Vice President*  
*Energy and Resources Policy*

April 29, 2015

The Honorable Lisa Murkowski  
 Chairman  
 Committee on Energy & Natural Resources  
 United States Senate  
 Washington, DC 20510

The Honorable Maria Cantwell  
 Ranking Member  
 Committee on Energy & Natural Resources  
 United States Senate  
 Washington, DC 20510

Dear Chairman Murkowski and Ranking Member Cantwell:

The National Association of Manufacturers (NAM), the largest manufacturing association in the United States representing small and large manufacturers in every industrial sector and in all 50 states, applauds the Committee on Energy and Natural Resources for its dedication to bipartisan measures that promote the adoption of energy efficient products and technologies in industrial, commercial, residential and federal government sectors. Energy efficiency and conservation offer immediate and cost-effective opportunities to reduce energy costs. Manufacturers produce the equipment, technologies, and supplies used to upgrade the energy efficiency of our buildings and products. We believe by expanding the use of energy efficient equipment and technologies we will reduce energy demand and improve our nation's energy security.

The NAM supports many of the energy efficiency measures introduced by members of the Committee and scheduled for discussion at this week's hearing. While not meant to be exhaustive, manufacturers would like to express support for the following bills:

- S. 720, the Energy Savings and Industrial Competitiveness Act of 2015, introduced by Sens. Rob Portman (R-OH) and Jeanne Shaheen (D-NH). This bill, the subject of many years of refinement and negotiation, would provide energy savings through stronger building codes, better energy information in commercial and residential buildings, and a focused set of industrial energy efficiency policies designed to accelerate the development, demonstration and deployment of technologies that will increase energy efficiency and improve productivity. S. 720 also contains the provisions of the Sensible Accounting to Value Energy (SAVE) Act, a NAM-supported measure that would provide homeowners better information on the energy cost of their home when obtaining mortgage financing.
- S. 723, the Utility Energy Service Contracts Improvement Act of 2015, introduced by Sen. Brian Schatz (D-HI), and S. 858, the Energy Savings Through Public-Private Partnerships Act of 2015, introduced by Sen. Cory Gardner (R-CO), which would promote the use of performance contracting to perform energy efficient retrofits in federal buildings. Manufacturers strongly support the use of performance contracts, a

proven tool to save energy, improve infrastructure, reduce operating expenses and decrease emissions with no upfront costs to the government or taxpayers. An NAM 2013 report determined that within the first two years of the Energy Savings and Performance-Based Contracting Investment Initiative \$1.3 billion worth of projects had been awarded, and another \$1 billion worth of projects were in various stages with jobs being created across the manufacturing supply chain as a result.

- S. 1038, the Energy Star Program Integrity Act, introduced by Sen. Jim Risch (R-ID). Manufacturers actively value and participate in the Energy Star program, but could be dissuaded from future Energy Star participation by a gap in the law that has given rise to private lawsuits over products that fall out of compliance with the program. These lawsuits seek to impose damages above and beyond the penalties already imposed by the Environmental Protection Agency (EPA), which administers the program. S. 1038 clarifies that no express or implied warranty is provided by reason of a disclosure relating to voluntary participation in the Energy Star program, maintaining consumer protection through existing EPA oversight while eliminating the threat of frivolous legal action against manufacturers.
- S. 1047, introduced by Sen. Lamar Alexander (R-TN), a bill that would eliminate the conflicts and overlaps between the EPA's recently-proposed rule delisting certain hydrofluorocarbons (HFCs) from the Significant New Alternative Policy (SNAP) program and the product design cycles required by Department of Energy (DOE) energy efficiency standards. Manufacturers have called on the EPA to align its SNAP rule with the supply and availability of replacement products and finished goods manufacturers' ability to make the necessary design changes to incorporate the rule's requirements with those of other laws and other agencies. S. 1047 would eliminate many of these conflicts.

Manufacturers are committed to reducing our energy intensity and producing more energy efficient buildings and consumer products to help reduce the U.S. demand for energy, save money, lower costs and lessen greenhouse gas emissions. A wide range of cost-effective energy-efficient technologies produced by manufacturers are readily available today. Greater product implementation means job growth in manufacturing. The NAM looks forward to working with the Committee to advance these and other energy efficiency measures in the 114<sup>th</sup> Congress.

Sincerely,



Ross Eisenberg  
Vice President  
Energy and Resources Policy

Cc: Members of the Senate Committee on Energy & Natural Resources



Chris Polychron, CIPS, CRS, GRI  
2015 President

Dale A. Statton  
Chief Executive Officer

GOVERNMENT AFFAIRS  
DIVISION  
Jerry Giovaniello, Senior Vice President  
Gary Weaver, Vice President  
Joe Ventrone, Vice President  
Scott Reiter, Vice President  
Jamie Gregory, Deputy Chief Lobbyist

500 New Jersey Ave., NW  
Washington, DC 20001-2020  
Ph. 202-383-1194 Fax 202-383-7580  
www.REALTOR.org

June 25, 2015

The Honorable Lisa Murkowski  
Chairman  
U.S. Senate Committee on Energy &  
Natural Resources  
709 Hart Senate Building  
Washington, D.C. 20510

The Honorable Maria Cantwell  
Ranking Member  
U.S. Senate Committee on Energy &  
Natural Resources  
511 Hart Senate Office Building  
Washington, D.C. 20510

Dear Chairman Murkowski and Ranking Member Cantwell:

On behalf of the more than one-million members of the National Association of REALTORS® (NAR) and its affiliates, the CCIM Institute and the Institute for Real Estate Management (IREM), I write to express our concerns with S. 1052, Senator Franken's benchmarking bill, which was considered during the April 30<sup>th</sup> Committee hearing on energy efficiency legislation. S. 1052 promotes a "one size fits all" solution to the issue of energy efficiency, which could have harmful effects on the real estate industry.

S. 1052 promotes what is commonly referred to as energy benchmarking, which requires building owners of commercial and multifamily properties to compare a building's energy usage to other buildings and make publically available either a "score" or at the very least an estimate of how much energy a building consumes. While several cities around the country have created these types of programs, there is no data suggesting that disclosing a building's energy usage will have an impact on either tenants' behavior or lead to an increase in energy efficiency for a building as a whole. Instead, the programs create misperceptions about the ability of a building owner to affect tenant energy usage, resulting in lower benchmarking scores that may unfairly devalue a building depending on the tenant mix and local market. They also have the effect of stigmatizing buildings which were built in conformance with older building codes, and thus will likely be scored lower.

Rather than using low benchmarking scores to try to promote efficient energy usage by tenants, a better route forward would be to offer voluntary financial incentives for building owners interested in exploring their property's energy performance and improvements that may effectively produce a positive return on investment. Not all markets are created equal, and the costs that can be absorbed in certain areas are not cost effective in others. Tenant lease rates, energy costs and finance rates are the most important variables accounting for energy retrofit activities. Financial incentives could show a building owner which upgrades provide for the most cost-effective improvement in energy efficiency. This aligns the advancement of energy efficiency with the economics of real estate development.

For these reasons, NAR feels strongly that this legislation could produce harmful results to the real estate industry.

Sincerely,

Chris Polychron  
2015 President, National Association of REALTORS®



REALTOR® is a registered collective membership mark which may be used only by real estate professionals who are members of the NATIONAL ASSOCIATION OF REALTORS® and subscribe to its strict Code of Ethics.



Representing Electrical and Medical  
Imaging Equipment Manufacturers  
[www.nema.org](http://www.nema.org)

April 29, 2015

Honorable Lisa Murkowski  
304 Dirksen Senate Office Building  
Washington, DC 20510

Honorable Maria Cantwell  
304 Dirksen Senate Office Building  
Washington, DC 20510

Dear Chairwoman Murkowski and Ranking Member Cantwell:

On behalf of the National Electrical Manufacturers Association (NEMA) – the trade association representing nearly 400 electrical and medical imaging manufacturers, 400,000 American jobs, and more than 7,000 facilities across the United States – please accept the following comments intended to support and strengthen energy efficiency legislation under consideration by the Senate Energy and Natural Resources Committee. We respectfully request that this statement be included for the record for the hearing to be held on April 30, 2015.

Of particular importance, we encourage the Committee to pass S.720, the *Energy Savings and Industrial Competitiveness Act of 2015*. Long-supported by NEMA, this bill has received bipartisan acclaim for its practical approach to improving energy efficiency in the United States. The bill would promote energy efficiency in building codes, schools, federal facilities, and industrial facilities – including pilot programs for the replacement of inefficient transformers and the installation of energy-efficient electric motors and controls that precisely manage the energy required for industrial and commercial applications.

Attached, we include comments on a select number of the bills the Committee is considering today, although this should not be construed as an exhaustive set of comments on the bills. If you have any questions, please contact either Joseph Eaves, [joseph.eaves@nema.org](mailto:joseph.eaves@nema.org), or Patrick Hughes, [patrick.hughes@nema.org](mailto:patrick.hughes@nema.org).

Sincerely,

A handwritten signature in cursive script that reads 'Kyle Pitsor'.

Kyle Pitsor  
Vice President, Government Relations

National Electrical Manufacturers Association (NEMA)  
Statement for the Record  
April 30, 2015

**National Electrical Manufacturer Association (NEMA) Comments on  
Energy Efficiency Legislation Under Consideration**

**S.720 (Portman), the Energy Savings and Industrial Competitiveness Act of 2015**

Long-supported by NEMA, the Energy Savings and Industrial Competitiveness Act has received bipartisan acclaim for its practical approach to improving energy efficiency in the United States. The bill would promote energy efficiency in building codes, schools, federal facilities, and industrial facilities. In particular, NEMA stands in strong support of the bill and three particular provisions:

*Sec. 101. Greater Energy Efficiency in Building Codes*

Congress should ensure that model building energy codes are strong and developed in a transparent manner in order to promote widespread code adoption and enforcement, which will lead to reductions in energy waste around the country. S.720 would also encourage the Department of Energy (DOE) to be more involved in the development, adoption, and compliance of building codes by providing technical assistance, projecting potential energy savings, and making available financial assistance.

*Sec. 221. Extended Product System Rebate Program*

Congress should enact a program to identify the best practices for deploying energy-efficient industrial and commercial motor-driven systems, including pumps, fans, compressors, and more. The potential cost-effective energy savings from an entire system is larger than the savings from a single component in isolation, therefore focusing on the system as a whole yields deeper and more cost-effective savings, and is in line with industry and regulatory trends. Similar legislation has been introduced in the Senate in previous years.

*Sec. 231. Energy-Efficient Transformer Rebate Program*

Congress should enact a performance-based program to catalyze the replacement of inefficient transformers with new, energy-efficient transformers that meet or exceed the Department of Energy's upcoming 2016 standards. Such a program would help identify best practices for removing old, inefficient transformers from buildings that would otherwise continue to operate, potentially for decades to come. Similar legislation has been introduced in the Senate in previous years.

We ask that the Committee support and include S.720 in the bill reported out by the Committee.

**S.1038 (Risch), ENERGY STAR Program Integrity Act of 2015**

Since its inception in 1992, the ENERGY STAR program has helped American consumers and businesses invest in energy efficiency and drastically cut energy costs. The program has also helped manufacturers push the research envelope, leading to job creation and the development of transformative technologies. However, despite the decades of proven success, due to a gap in federal law, the manufacturers that voluntarily choose to participate in this program could

National Electrical Manufacturers Association (NEMA)  
Statement for the Record  
April 30, 2015

become targets for unnecessary and costly class action litigation, potentially deterring them from continuing to participate in this important program. S.1038 will address that gap in the law.

For a product to qualify as an "ENERGY STAR" it must meet strict guidelines set by the Environmental Protection Agency (EPA), and it must be tested and approved by EPA-recognized laboratories and certification bodies. Even after the products have been approved, the EPA and the Department of Energy (DOE) oversee off-the-shelf testing to ensure these products continue to perform according to ENERGY STAR standards. Occasionally, products are found to be out of compliance and are disqualified. Once a product is disqualified, its manufacturer must initiate detailed product control measures and, if deemed appropriate by the EPA, provide financial reimbursement to consumers. To ensure transparency for the consumer, the EPA also maintains an up-to-date list of products that have been disqualified publically available on its website.

However, despite these effective enforcement procedures, the law currently allows suits to be brought against manufacturers, regardless of whether the EPA has determined that consumers have been harmed and in addition to any remediation measures, including consumer compensation, already ordered. If continued unchecked, such litigation costs could deter manufacturers from participating in ENERGY STAR, harming American consumers in the process.

We ask that the Committee support and include S.1038 in the bill reported out by the Committee.

#### **S.858 (Gardner), the Energy Savings Through Public-Private Partnerships Act of 2015**

Energy Savings Performance Contracts (ESPCs) and Utility Energy Service Contracts (UESCs) allow Federal agencies to increase their efficiency and thereby reduce their energy costs using private sector funding and expertise. In both cases an approved contractor designs and installs solutions and equipment which together reduce the energy consumption of a federal facility and gets paid back through savings on utility bills that result from the project over a stipulated period of time. In the case of an ESPC these energy savings are guaranteed to occur by the contractor – a federal agency will pay no more for the contract and energy bills together than they would have paid for energy bills alone before the ESPC.

Using an ESPC or UESC in the federal government eliminates the need for appropriated dollars for equipment replacement and for operations and maintenance of the energy using equipment. According to the Federal Energy Management Program (FEMP), approximately 600 performance contracts worth \$5.3 billion have been awarded throughout 25 federal agencies and in 49 states. These projects have resulted in energy savings valued at \$13.1 billion, of which approximately \$10.1 billion went to repay project investments, accruing a net savings of \$3 billion to the federal government.

Specifically, this bill will help ensure that federal agencies are utilizing to the fullest extent possible all cost-effective measures for energy conservation. The legislation promotes transparency and accountability across the federal government and will further enable federal

National Electrical Manufacturers Association (NEMA)  
Statement for the Record  
April 30, 2015

agencies to maximize their present energy efficiency contracting authorities. The legislation streamlines the statute for providing consistency and clarification within the existing ESPC law. The bill further supports the ability of federal agencies to leverage the private sector for energy savings without relying on appropriated funds.

We ask that the Committee support and include S.858 in the bill reported out by the Committee.

**S.869 (Hoeven), the All-of-the-Above Federal Building Energy Conservation Act of 2015**

NEMA believes that the federal government should extend its energy intensity reduction goal of 3 percent per year through 2020. Set to expire this year, renewing this goal would focus federal efforts to further reduce energy waste and wasted taxpayer dollars. Furthermore, if energy savings performance contracts are used, these energy savings could come at no cost to taxpayers.

S.869 extends the federal goal through the end of 2017, with a study to be conducted at the end of that period on the feasibility of extending the goal through 2030. NEMA recommends that the bill extend the energy intensity reduction goal of 3 percent per year through 2020, and then extend the goal through the end of 2030 pending a favorable review.

NEMA also supports the provisions of Sec. 3 of S.869 that would require federal facilities to comply with the latest version of either ASHRAE 90.1 or the International Energy Conservation Code. Ensuring that federal facilities are built to the latest energy codes and standards is a critical step towards meeting federal energy intensity reductions and achieving cost savings for taxpayers.

We ask that the Committee support and include S.869 with the amendment detailed above in the bill reported out by the Committee.

**S.886 (Udall), the Smart Energy and Water Efficiency Act of 2015**

This bill creates federally supported pilot projects that reduce the financial risks that inhibit water utility innovation to save energy. Federal funding creates incentives for cost sharing public private partnerships that lower the cost of innovating. Successful demonstration projects are more likely to result in innovative technology being adopted in multiple communities.

These pilot programs would be funded by grants through the DOE State Energy Program. The bill authorizes this program to increase the effectiveness of water distribution networks by delivering better quality water while using less energy, including through demonstration projects as appropriate.

We ask that the Committee support and include S.886 in the bill reported out by the Committee.

National Electrical Manufacturers Association (NEMA)  
Statement for the Record  
April 30, 2015

**S.523 (Collins), a bill to coordinate the provision of energy retrofitting assistance to schools**

NEMA supports S.523 because it would streamline available federal energy efficiency programs and financing to help improve efficiency and lower energy costs for our nation's schools. The aim is to help school officials learn about federal incentives that are available to promote efficiency in schools and to know about other schools' efforts to save energy and lower energy costs.

We ask that the Committee support and include S.523 in the bill reported out by the Committee.

**S.1052 (Franken), a bill to require a study on the impact of State and local performance benchmarking and disclosure policies for commercial and multifamily buildings, to provide for competitive awards to utilities, States, and units of local government, and for other purposes**

As proponents of building energy benchmarking and disclosure policies, NEMA supports S.1052, which would provide additional insight into the best practices that cities should follow when enacting benchmarking and disclosure policies. NEMA has developed its own recommendations to cities for best practices when adopting benchmarking and disclosure ordinances, and we look forward to working with the Department of Energy on this study if S.1052 is enacted.

NEMA also supports the sections authorizing grants to utilities for implementing programs to provide building owners with aggregated and anonymized information about their buildings' energy use, as well as grants to states and local governments to implement benchmarking and disclosure policies.

We ask that the Committee support and include S.1052 in the bill reported out by the Committee.

**S.1053 (Franken), a bill to amend the *National Energy Conservation Policy Act* to promote alternative fueled vehicle fleets and infrastructure**

NEMA supports S.1053, which would allow performance contracts to be used to install electric vehicle charging infrastructure in federal facilities. We agree that Congress should amend the *National Energy Conservation Policy Act* to allow federal agencies to use energy savings performance contracts (ESPCs) to install electric vehicle charging equipment. Doing so would allow federal agencies to take advantage of a more diverse fleet of vehicles while reducing our dependence on foreign oil without the need for additional appropriations.

We ask that the Committee support and include S.1053 in the bill reported out by the Committee.

National Electrical Manufacturers Association (NEMA)  
Statement for the Record  
April 30, 2015

**Additional Recommendations for Energy Efficiency Legislation**

**Energy Policy and Conservation Act (EPCA) Reform**

NEMA member manufacturers have become increasingly concerned about the regulatory burden of the EPCA rulemakings, their adaptation to final rules, compliance and certification. We believe that the structure of the statute is partly responsible for this burden, and it is therefore something that needs congressional review. The legislative framework has been successful in driving energy conservation, and this is important, but it is clear that the legislative framework is not an unbounded command to maximize energy efficiency from products and components wherever it may be found. The statute is clear that there are limits on the Department's ability to legislate product features that have consumer utility out of existence or impose burdens that exceeds benefits.

Areas of reform that Congress should consider include but not limited to:

Forego initiating rulemaking of a previous iteration of a rule until the preceding versions outcome is analyzed against actual results versus simply using regulators' outdated analytical tools. Where a rule has failed to achieve its purpose, the rule should be withdrawn and modified (if necessary) with full public and stakeholder engagement.

Ensure that agencies coordinate rulemaking activities among themselves and in transparent and collaborative ways with the private sector so that a single product sector or industry is not subjected to multiple and cumulative regulations.

Encourage Congress to consult with stakeholders inside and outside of government and require proof that a substantial public benefit has been or can be demonstrated to preclude the regulatory weight of serial rulemakings when considering new or amended legislation.

**External Power Supply Technical Fix**

In 2005, Congress amended the Energy Policy and Conservation Act, to define and direct the Department of Energy to set standards for External Power Supplies (EPS). An External Power Supply was defined as "external power supply circuit that is used to convert household electric current into DC current or lower-voltage AC current to operate a consumer product." It can be readily seen that the definition of an external power supply uses the words external, power and supply, making it distinctly circular and vague. This has created significant confusion in the affected industries.

According to the Department of Energy, the EPS products that were meant to be covered are those that "convert household electric current into direct current or lower-voltage alternating current to operate a consumer product such as a laptop computer or smartphone." However,

National Electrical Manufacturers Association (NEMA)  
Statement for the Record  
April 30, 2015

given the broad definition in EPCACT 2005, additional products were brought into the definition of a covered product via the DOE rulemaking process.

In 2014, DOE issued a final rule. Despite our industry members repeatedly asking in writing and in public meetings for the Department to clearly identify what types of products impacting lighting technologies might be covered as “EPS”, no clear answer was provided until the rule was issued.

The final rule includes as a regulated “EPS” certain drivers that power solid state lighting products (e.g., LEDs), which NEMA contends was never intended by Congress to be considered as consumer external power supplies.

Congress needs to reaffirm its intent of the legislation that Solid State Lighting Drivers were not included in its original intent. Congress should pass legislation that excludes SSL Drivers from the EPS rulemaking, making it clear that Congress intended the rule to focus, as the DOE website states, on products that “convert household electric current into direct current or lower-voltage alternating current to operate a consumer product such as a laptop computer or smartphone.”

April 30, 2015

**Statement for the Record on behalf of  
National Ground Water Association  
Senate Energy & Natural Resources Committee  
Hearing on Energy Efficiency Legislation**

The National Ground Water Association (NGWA) is the world's largest organization of groundwater professionals, whose membership also comprises professionals who install geothermal heat pump systems (GHPs). As buildings are one of the largest users of energy, a GHP system can be a valuable tool in reducing energy use, flattening electric utility load patterns, and reducing energy bills for consumers.

In a recent Executive Order from March 19, 2015 "Planning for Federal Sustainability in the Next Decade," the Administration included GHPs in its definition of renewable energy located in Section 19(v) of the order:

*"Renewable electric energy" means energy produced by solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, geothermal heat pumps, microturbines, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project.*

Similar language was also included in Section 4114 of the House discussion draft on energy efficiency released on April 27th. NGWA is encouraged by the effort to harmonize conflicting definitions of renewable and hopes the Committee will take similar action to clarify the definition of renewable energy by adopting similar language. The benefits of GHP systems are clear. Many states and utilities have recognized and incorporated GHP systems in their renewable energy and energy efficiency programs, and the inclusion of geothermal in the definition of renewable will enable more widespread adoption of this important technology.

Please contact Lauren Schapker, government affairs director for NGWA at 202.888.9151 with any questions or additional information you might need on GHPs.



Address/ 601 Dempsey Road/ Westerville, Ohio 43081-8578 U.S.A.  
Phone/ Toll-free 800 551.7379/ 614 898.7791 Fax/ 614 898.7786  
E-mail/ [ngwa@ngwa.org](mailto:ngwa@ngwa.org) [www/ngwa.org](http://www/ngwa.org) and [weflownet.org](http://weflownet.org)



April 30, 2015

The Honorable Lisa Murkowski  
Chair  
U.S. Senate Committee on Energy  
and Natural Resources  
304 Dirksen Senate Office Building  
Washington, DC 20510

The Honorable Maria Cantwell  
Ranking Member  
U.S. Senate Committee on Energy  
and Natural Resources  
304 Dirksen Senate Office Building  
Washington, DC 20510

Dear Chairwoman Murkowski and Ranking Member Cantwell,

Thank you for the opportunity to submit a written statement in conjunction with the Senate Energy and Natural Resources Committee's hearing on energy efficiency legislation. The National Housing Trust (NHT) is the nation's leading expert in "preserving and improving" affordable housing, ensuring that privately owned rental housing remains in our affordable housing stock and is sustainable over time. Using the tools of real estate development, rehabilitation, finance, and policy advocacy, the Trust is responsible for saving more than 25,000 affordable homes in 41 states, leveraging more than \$1 billion in financing.

**Energy Efficiency Retrofits in Multifamily Affordable Housing Saves Energy and Costs**

NHT encourages the Committee to support legislation to promote energy efficiency retrofits in affordable multifamily housing. In a constrained resource environment, improving energy efficiency in assisted housing reduces energy while cutting operating costs for property owners.

Billions of dollars of energy savings potential are sitting in our nation's multifamily buildings. According to a 2009 McKinsey report, unlocking energy efficiency opportunities in our nation's low income residential buildings between 2009 and 2020 would provide a present value of \$80 billion in savings. Other research indicates that energy efficiency improvements in affordable multifamily housing will have a significant impact on both energy usage and costs to property owners and residents:

- In a 2009 study, the Benningfield Group projected that the multifamily sector has an "achievable potential" of 30 percent improvement in energy efficiency by 2020, which would save \$9 billion in energy costs for building owners and tenants and reduce carbon dioxide emissions equivalent to shuttering approximately 20 coal power plants.
- The American Council for an Energy-Efficient Economy (ACEEE) and Center for Neighborhood Technology (CNT) Energy estimated in a 2012 report that enrolling the entire U.S. multifamily sector in a "quality" utility program (achieving energy efficiency improvements of 15 percent for electricity and 30 percent for natural gas) would create annual utility bill savings totaling more than \$3.3 billion for building owners and residents.

- A 2012 report commissioned by Deutsche Bank Americas Foundation and Living Cities found that energy efficiency retrofits conducted on more than 21,000 affordable housing units in New York City generated significant energy reductions that reduced fuel costs by an average of \$240 per unit annually and electric costs by \$50 per unit annually.

#### **NHT Has Saved Costs Through Energy Efficiency Retrofits and Renewables**

NHT/Enterprise, a joint effort of NHT and Enterprise Community Partners, Inc., has invested \$2.5 million in energy efficiency retrofits within its existing housing developments across 11 properties in Washington, DC, Maryland, Virginia, and Florida. These energy efficiency retrofits have saved NHT/Enterprise, its residents, and partners, \$350,000 per year in utility costs, a reduction of between 15-20 percent in cost. The savings represents a seven to eight year payback on the initial investment. We have avoided 165 metric tons of greenhouse gases annually through energy efficiency.

Through the NHT Renewable program, NHT/Enterprise dedicated \$1.25 million in investment in solar power. The projects, installed across five properties (11 buildings) in Washington, DC generate one half Megawatt of energy, the equivalent of approximately 50 percent of NHT/Enterprise's common area energy usage on its DC properties.

#### **NHT Opposes S. 939**

NHT is concerned about S. 939, which would consolidate several green building programs within the U.S. Department of Energy (DOE). We want federal programs to be as effective as possible, but this proposed legislation does not accomplish this worthy goal. Rather, S. 939 will create an administrative burden on states, localities and on DOE, while not implementing recommendations proposed by the Government Accountability Office (GAO).

Buildings consume 40 percent of the nation's energy. Reducing energy and water waste involves a number of federal programs that target different segments of the diverse building sector. The federal government is successfully using a variety of program approaches to overcome the complex challenge of reducing energy and water consumption, which ultimately saves American families and businesses energy and money, boosting job creation and the nation's economy.

This legislation arbitrarily presumes that there are redundancies among federal efforts to work together and with states, homeowners, building owners, and private businesses to make our economy more efficient. In fact, the GAO report referenced in S. 939 does not recommend more wasteful study but rather recommends *enhanced coordination* between agencies to increase effectiveness of complimentary programs<sup>1</sup>. Nothing in the GAO report suggests elimination of programs and the report asserts that in some areas, "it may be appropriate for multiple agencies or entities to be involved in the same programmatic or policy area due to the nature or magnitude of the federal effort<sup>2</sup>." Thus, S. 939, by focusing on onerous reporting from a single agency, actually detracts from the GAO recommendations by diverting staff time and attention away from interagency collaboration.

<sup>1</sup> United States Government Accountability Office, Report to the Subcommittee on Federal Financial Management, Government Information, Federal Services, and International Security, Committee on Homeland Security and Governmental Affairs, U.S. Senate, "Federal Initiatives for the Nonfederal Sector Could Benefit from More Interagency Collaboration," page 21 (November 2011).

<sup>2</sup> United States Government Accountability Office, Report to Congressional Addressees, "2012 Annual Report: Opportunities to Reduce Duplication, Overlap and Fragmentation, Achieve Savings, and Enhance Revenue," page 2 (February 2012).

385

Without substantial changes to actually improve the coordination of these programs, we urge the committee to reject this proposal. Thank you for your consideration and please let me know if I can provide additional information.

Sincerely,

A handwritten signature in black ink that reads "Michael Bodaken". The signature is written in a cursive style with a prominent initial "M".

Michael Bodaken  
President  
National Housing Trust

Testimony Submitted By



The National Insulation Association

Submitted To:

The U.S. Senate Committee on Energy and Natural  
Resources

“Hearing on Energy Efficiency Legislation”

April 30, 2015

Michele M. Jones – Executive President/CEO  
National Insulation Association  
12100 Sunset Hills Rd., Ste. 330  
Reston, VA 20190  
P: (703) 464-6422

---

Chairwoman Murkowski, Ranking Member Cantwell, and Members of the Energy and Natural Resources, thank you for the opportunity to submit comments in relation to the hearing held on Energy Efficiency Legislation on April 30, 2015. My name is Michele Jones and I am the Executive Vice President and CEO of the National Insulation Association (NIA), the national trade association representing the mechanical insulation industry. The industry represents over 120,000 employees and our members, the vast majority of which are small businesses have over 800 brick and mortar locations across the United States, and have more than a century-long track record of providing large and small scale long-term energy efficiency, cost savings, personnel safety benefits, and emissions reductions at manufacturing facilities, power plants, refineries, hospitals, universities, office and government buildings across the country.

I write today to first thank you for your commitment as a Committee to continuing to pursue broad-based, comprehensive energy efficiency legislation and push our country forward, both in the private and public sector, to become more energy efficient.

Thermal Insulation for piping, equipment, and other mechanical devices, known as mechanical insulation, is a proven energy efficiency and emission reduction technology that will improve personnel safety and reduce costs while also creating tens of thousands of jobs. On this point, it is important to highlight that over 95% of the products utilized in the mechanical insulation industry are made in the United States.

Unfortunately, the benefits of mechanical insulation are often overlooked by all stakeholders (mechanical engineers, energy engineers, maintenance engineers, specifiers, facility owners and managers, financial officers, etc.) during new construction, retrofitting, and maintenance opportunities. The benefits of this

technology are further reduced because minimum requirements in new construction or retrofit applications are seldom exceeded and maintenance is not accomplished in a timely and proper manner.

The National Insulation Association has comprehensive estimates on energy savings, cost savings, and return on investment for implementing and maintaining a comprehensive mechanical insulation maintenance program in the commercial and industrial market segments. Those estimates indicate the following:

- energy savings of 1.22 quads of primary energy or \$3.8 billion per year
- return on investment range from 25%–100%
- CO<sub>2</sub> reductions of 105 million metric tons (MMT<sub>CO2</sub>)

We are also fully aware that thermal insulation can have an enormous impact in energy and water efficiency when dealing with potable hot and chilled water systems.

It is with this knowledge in sight that we have worked with Representative Adam Kinzinger (R-IL) and Representative Jerry McNerney (D-CA) to introduce H.R.568, the Thermal Insulation Efficiency Improvement Act, a bill that directs the Department of Energy to submit a report within one year on the impact of increased use of thermal insulation on both energy and water use systems for potable hot and chilled water in federal buildings including return on investment estimates on that increased use.

This legislation was introduced as H.R.4801 and passed in the 113<sup>th</sup> Congress by the House Energy and Commerce Committee and the full House of Representatives by voice vote on June 23, 2014 and the current version (H.R.568) was included in Title IV of

the House Energy and Commerce's energy efficiency discussion draft that was recently released and discussed in the Committee on April 30, 2015.

As a result of the broad bipartisan support of this legislation and the fact that the Department of Energy worked with stakeholders on drafting the bill when it was originally drafted, we would ask that your Committee include this language in any energy and water efficiency legislation that you draft and move forward through the Senate Committee on Energy and Natural Resources.

NIA and its members are committed to working with Congress, the Department of Energy and other federal agencies, and key stakeholder groups on energy and water efficiency nationwide and we look forward to continuing to work with you, your Committee, and your counterparts in the House of Representatives to ensure that our nation is continually moving forward to become the most energy and water efficient nation that we can possibly become and we stand with you and the Committee in your commitment to these issues.



May 20, 2015

The Honorable Lisa Murkowski  
 Chairman  
 Senate Energy & Natural Resources Committee  
 United States Senate  
 304 Dirksen Senate Office Building  
 Washington, D.C. 20510

The Honorable Maria Cantwell  
 Ranking Member  
 Senate Energy & Natural Resources Committee  
 United States Senate  
 304 Dirksen Senate Office Building  
 Washington, D.C. 20510

Chairman Murkowski and Ranking Member Cantwell:

The National Propane Gas Association (NPGA) is the national voice for the odorized propane gas industry. NPGA's nearly 3,000 member companies – the majority of which are small family-owned businesses – fuel homes, businesses, and vehicles in all fifty states. We would like to submit this letter for the record of the hearing on energy efficiency legislation, held before your committee on April 30, 2015.

Aside from propane's most well-known use in 42 million American backyard grills, nearly five and a half million U.S. households rely on propane for their home heating needs. These households are predominantly non-urban and off the natural gas main, and they depend on propane gas as a clean-burning, efficient, low-cost and reliable alternative to fuel oil and/or electricity. As Congress considers policies to incentivize energy efficiency in American households and commerce, NPGA believes propane gas can play a significant role in achieving this common goal.

New innovation creates new and efficient uses for propane every day - commercial lawn mowers, furnaces, forklifts, water heaters, fleet vehicles, and clothes dryers to name a few. Propane production is soaring as part of the boom in American natural gas and crude oil production. In fact, the United States is now a net exporter of propane, and domestic sources of propane are capable of handling 100 percent of demand. Nearly 80 percent of propane is produced from natural gas.

Since the purpose of this hearing was to examine energy efficiency proposals, before discussing several of the specific bills which your Committee is currently reviewing, we wanted to bring up two yet-to-be introduced energy efficiency proposals.

The first proposal relates to carbon labeling of consumer appliances. Current federal law regulates the efficiency of many types of consumer appliances, including furnaces, water heaters, heat pumps, and air conditioners. As originally enacted, the efficiencies of these products are required to be measured at the appliance itself and do not reflect other factors upstream from the appliance. NPGA urges your Committee to consider requiring the Federal Trade Commission to include Full Fuel Cycle (FFC) carbon emissions information on all yellow EnergyGuide labels for federally-regulated consumer products.

NPGA believes that FFC analysis is the most accurate way to calculate energy use as well as environmental emissions. FFC accounts for:

- Energy consumed in the extraction, processing and transport of primary fuels;
- Energy losses in electric power-generation or gas processing plants;
- Energy losses associated with transmission and distribution of fuel to the end user; and
- Greenhouse gas (GHG) emissions associated with each step within this process.

An FFC analysis differs from a site energy, or point-of-use in fundamental ways. Efficiency measurements based on a site energy calculation do not account for the efficiency of all the upstream energy use and emissions associated with delivering the fuel to its point of use. Therefore, it fails to provide a complete energy efficiency, energy consumption, and greenhouse gas profile. By providing consumers with the FFC appliance labeling information, Congress would enable a market-based approach to addressing efficiency and emissions. These labels can be created in a dynamic way to account for differences in regional energy production and allow consumers to have a very accurate picture of their appliances' FFC profile.

An additional proposal that the Committee should consider is the promotion and adoption of alternative fuels for commercial lawn mowers. While this may seem like an inconsequential portion of the country's energy consumption, lawn mowers actually consume more than one billion gallons of gasoline annually. Encouraging the use of alternative fuels, like propane, would reduce the energy and environmental impact of commercial mowing, helping the Committee meet its goals for this energy package.

This is not only smart public policy, but also a good business decision for American companies. According to the Propane Education and Research Council, propane-fueled mowers cost about 30 percent less to operate than gasoline mowers. And because propane-fueled mowers generate up to 50 percent less greenhouse gas emissions, busy landscape contractors can continue to operate on ozone-alert days.

Of the proposals being considered by the Energy and Natural Resources Committee, there are several with an impact on the propane industry. One such bill is S. 1089, which would postpone the "furnace rule" until more adequate analysis can be done. As we have shared with the Department of Energy on this proposed rule, we appreciate DOE's desire to advance energy efficiency and conservation in relation to residential furnaces, but the proposed rule may well have a negative impact on the residential furnace market both for consumers and for fuel suppliers such as retail propane marketers. It is for this reason that NPGA supports S. 1089 to address the shortcomings of the proposed furnace rule.

To highlight the issues with the rule, as an example, furnaces with a required 92 percent annual fuel utilization efficiency (AFUE) would result in positive pressure in the venting systems, thus prohibiting direct replacement for an existing natural draft furnace or in an existing application such as when a furnace and gas water heater are commonly vented into a masonry chimney. A 92 percent AFUE furnace would also need a dedicated vent discharged to an appropriate outside area that may not be in close proximity to an existing furnace. Any of these circumstances would add both costs (to reconfigure the venting system) and potential safety concerns if, in the case of an orphaned water heater, the water heater vent is not properly sized. These could well be deemed unacceptable in the marketplace, and we are concerned that the proposal, if finalized, would result in a significant percentage of fuel switching by furnace users.

S. 869, the All-of-the-Above Federal Building Energy Conservation Act of 2015, is another bill that would benefit the propane industry. As subsequent analysis has shown, Section 433 of the Energy Independence and Security Act of 2007 places an unworkable, and frankly unreasonable, restriction on

fuel choice. Eliminating the use of fossil fuel-generated energy ignores the realities of the changing energy landscape of the last decade. Even the Obama Administration has called on Congress to modify this provision. The goal of federal policy in this area should be increasing efficiency, not banning certain categories of fuels.

By eliminating this mandate, S. 869 would allow federal buildings to take advantage of the abundance of our domestic energy supply, including the propane boom discussed above. With its well-developed grid, natural gas is an important component of the energy infrastructure. However, there are also many areas of the U.S. that are beyond natural gas distribution systems. Propane is an excellent fuel to fill this void, especially in rural and remote applications where electric efficiency and reliability can be even lower than in urban areas. Federal facilities in remote locations could see the benefit of increased adoption of propane technologies, including the further development of on-site, propane-fueled combined heat and power (CHP) applications.

Thank you for allowing NPGA to submit these comments to be a part of the official hearing record for the Senate Energy and Natural Resources Committee. I am happy to discuss any of these issues in further detail should the Committee wish.

Sincerely,



Richard Roldan  
President & Chief Executive Officer  
National Propane Gas Association

---

NPGA is the national trade association of the propane gas industry with a membership of approximately 3,000 companies, including 38 affiliated state and regional associations representing members in all 50 states. Although the single largest group of NPGA members is retail marketers of propane gas, the membership includes propane producers, transporters and wholesalers, as well as manufacturers and distributors of associated equipment, containers and appliances. More than 55 million households use propane gas for space heating, water heating, cooking, outdoor recreation, and other uses. Propane gas is also used in millions of installations nationwide for commercial heating and cooking, in agriculture, in industrial processing, and as a clean alternative engine fuel for over-the-road vehicles and industrial lift trucks.

## NiSource Inc. Statement for the Record

### Senate Energy and Natural Resources Committee Hearing on Energy Efficiency Legislation

#### In support of S. 1029, a bill to prohibit DOE from prescribing a final rule amending the efficiency standards for residential non-weatherized gas furnaces or mobile home furnaces until an analysis has been completed

April 30, 2015

#### Issue Summary:

The US Department of Energy is currently proposing a new rule that would eliminate all residential non-condensing furnaces from the market by requiring manufacturers to produce only 92 percent (AFUE) or higher efficiency condensing furnaces. The goal of the rulemaking, according to the DOE, is to increase energy efficiency and lower emissions.

#### NiSource Position:

- The higher cost of the furnaces will impact all consumers, who now won't have a choice.
  - On average, condensing furnaces cost about \$350 more than non-condensing furnaces, along with an additional \$1,500 and \$2,200 in installation costs.
  - DOE states that under its proposed rule, customers could bear between \$6 and \$12 billion in new costs associated with higher efficiency furnaces.
- Costs significantly increase for those living in homes that were not designed with condensing furnaces in mind and would require significant remodeling – for example older homes and multi-family homes with a central flue. This fact was confirmed through conversations with many of NiSource's trade partners who install these furnaces on a daily basis.
- According to the Department of Housing and Urban Development American Housing Survey, 41 percent of owner-occupied homes were built prior 1969, and the median age of an owner-occupied home is 35 years old (2011 data) – the oldest homes are located in the Northeast.
  - SOURCE: <http://eyeonhousing.org/2014/02/the-age-of-the-housing-stock-by-state/>
  - NOTE: Data available by service territory if helpful
- And, 60 percent of households live in multi-unit structures according to the National Multifamily Housing Council (2014 data).
  - SOURCE: <http://www.nmhc.org/Content.aspx?id=4708%20>
- About 9 million low-income *homeowners* use a natural gas furnace. When it is necessary to replace existing heating equipment, these consumers would be faced with higher upfront costs imposed

under DOE's rule. Because these low-income households have fewer resources to pay for the installation of a higher-efficiency gas furnace, they are more likely to switch to less-expensive electric equipment that costs more to operate. This, in turn, means low-income households are *more* likely than other homes to see higher utility bills under DOE's rule.

- NiSource believes that the financial burden to comply with the rule could cause some homeowners, particularly those on fixed incomes – like seniors – and those near or below the poverty level to make unsafe choices to keep themselves and their families warm.
  - Unsafe choices could include the use of supplemental heating sources not designed for inside the home, including kerosene heaters, an open oven, gas space heaters or modifying or incorrectly installing a furnace.
    - According to the U.S. Fire Administration, supplemental room heaters accounted for over 45,000 fires in 2012 – leading to 195 deaths and 775 injuries nationwide.
  - These unsafe decisions could significantly increase carbon monoxide in the home.
    - According to the Centers for Disease Control, each year, more than 400 Americans die, more than 4,000 are hospitalized and more than 20,000 visit the emergency room from unintentional carbon monoxide poisoning not linked to fires.
- NiSource believes that the modest energy efficiency gains projected do not outweigh the potential significant costs that some residential customers would endure to ensure compliance with the rule – these costs could reach into the thousands of dollars.
- In addition, our utility-sponsored energy efficiency programs are already making progress in reducing energy use and lowering bills for customers:

Company	Customers in State	Customers Served with EE	MCF Saved	\$ Saved
Columbia Gas of Kentucky	~500,000	1,754	10,050	\$65,000
Columbia Gas of Maryland	~33,000	11	276	\$93
Columbia Gas of Massachusetts	~300,000	16,854	491,358	\$3,404,000
Columbia Gas of Ohio	~1,400,000	471,648	616,629	\$3,513,000
Columbia Gas of Pennsylvania	~400,000	944	18,974	\$84,000
Columbia Gas of	~250,000	7,608	42,174	\$298,000

Virginia				
NIPSCO Gas	~800,000	N/A	293,614	\$2,137,000
Total Gas			1,473,075	\$9,501,093
NIPSCO Electric	~500,000		55,016 MWh	\$6,651,434
Total EE Savings	~4,000,000			\$16,153,000

### Our Request

NiSource supports S. 1029. The rule should be rewritten with the help of industry and consumer advocates to ensure that the standard does not place an economic burden on our most vulnerable populations and safeguards against our customers using unsafe methods to heat their homes.

## MEMORANDUM

**TO:** Cathy Cahill, the Senate Committee on Energy and Natural Resources (SENR)  
**FROM:** Bryan Brendle, Portland Cement Association  
**RE:** Energy Efficiency Legislation and “Life Cycle Analysis” (LCA)  
**DATE:** May 12, 2015

Thank you for the opportunity to comment on the energy efficiency measures reviewed by the Committee on Energy and Natural Resources (SENR) during a hearing on April 30, including the “Energy Savings and Industrial Competitiveness Act of 2015” (S. 720). PCA represents 27 U.S. cement companies operating 82 manufacturing plants in 35 states. Collectively, these companies account for approximately 80% of domestic cement-making capacity, with distribution centers in all 50 states.

While cement makers continue to make energy efficiency gains in the manufacturing process – a 13 percent gain from 1998 to 2007 – the energy efficient and durable performance characteristics of concrete products provide substantial efficiency benefits to commercial and residential buildings. To quantify these benefits, PCA has established a partnership with the Concrete Sustainability Hub (CSH) at the Massachusetts Institute of Technology (MIT) to develop design tools, including life cycle analysis (LCA), to accurately measure the energy performance of these structures. PCA believes that identifying LCA as a tool for quantifying building energy efficiency within the context of energy efficiency legislation is consistent with goals of S. 720.

For example, the bill outlines the types of technical assistance that the Secretary of Energy would provide to bodies developing model building energy codes. S. 720, Section 307 states that the Secretary may provide “building energy analysis and design tools” and “definitions of energy use intensity” to code-setting organizations. Lawmakers can provide useful technical assistance to code-setting bodies by including a LCA definition to assure a comprehensive and accurate measure of a structure’s energy footprint over the course of its lifespan.

Pursuant to the request of Senate Energy and Natural Resources Committee staff, cement makers offer the following definition for LCA based on research performed by MIT. While supporting the policy objectives of model building energy codes, inclusion of the following definition will provide federal officials and code-drafting bodies clear and consistent criteria that will advance the objectives of the model code provisions of energy efficiency legislation:

*Life cycle assessment (LCA) for structures is a procedure that calculates the environmental impacts, such as GHG emissions, energy consumption, water use, and eutrophication potential in order to compare the tradeoffs in environmental impact and performance for different designs and features, over the life of the structure. To maximize effectiveness, the assessment should be applied during the initial, design phase of the construction process.*

As you develop comprehensive energy legislation, cement makers urge you to adopt a similarly styled definition for LCA to increase the energy efficiency of the nation's buildings and infrastructure. If you have any questions or would like to discuss LCA further, feel free to contact me at 202-719-1978.

CC: Members of the Senate Committee on Energy and Natural Resources

---

**Subject:** FW: S.1038 energy efficiency hrg

The Honorable Lisa Murkowski  
Chairman  
U.S. Senate Committee on Energy and Natural Resources  
Washington, D.C. 20510

The Honorable Maria Cantwell  
Ranking Member  
U.S. Senate Committee on Energy and Natural Resources  
Washington, D.C. 20510

Re: **Oppose S.1038**, to be considered at April 30, 2015 hearing

Dear Chairman Murkowski, Ranking Member Cantwell and Members of the Committee:

On behalf of Public Citizen's 350,000 members and supporters, we write to urge opposition to S. 1038, a bill that would restrict consumer claims against manufacturers of products disqualified from the Energy Star program. Specifically, it would bar any claims under state or federal law, including claims of breach of express or implied warranty. Removing private consumer remedies from the Energy Star program will remove incentives for manufacturers to properly comply with the program's requirements.

Proponents of the bill had claimed that manufacturers had a disincentive to participate in the Energy Star program due to the possibility of private legal actions against them. However, this contention is highly unlikely. Energy Star is a highly valued certification used by manufacturers and relied upon by consumers as they increasingly demand products that feature the Energy Star mark.

Consumers look for the mark to buy appliances that help them to save costs and energy. Companies also market and promote their Energy Star certifications for their respective products. Based on the popularity of the program among consumers and its consequent value to manufacturers, manufacturers would not remove themselves from the program to avoid litigation. That is in fact rare in these cases.

Further, participation in the Energy Star program is an indicator of excellence and manufacturers' commitment to energy savings. Products that fail to meet the requirements do not belong in the program. The bill would help manufacturers to avoid accountability for failing to meet requirements and for misrepresenting to consumers about the energy saving possibilities related to their products.

Moreover, the impact on state common law is extremely troubling. States have a traditional role to provide an avenue for consumers to seek compensation for injury and to preserve the effects of state-law liability in ensuring compliance with law. Rights of action created by state law to fulfill these functions are property interests protected by the due process clause, with its requirements of notice and an opportunity to be heard before a person may be deprived of a property interest. This legislation would allow the elimination of state-law rights without any real protections or meaningful recourse for consumers.

399

We urge you to oppose S. 1038 and to exclude it from any energy efficiency legislative package.

Sincerely,

Christine Hines  
Consumer and Civil Justice Counsel

Lisa Gilbert  
Director, Public Citizen's Congress Watch division



Puget Sound Energy  
P.O. Box 97034  
Bellevue, WA 98009-9734  
PSE.com

Kimberly J. Harris  
President and Chief Executive Officer

April 27, 2015

The Honorable Lisa Murkowski  
Chairwoman  
Senate Committee on Energy &  
Natural Resources  
304 Dirksen Senate Office Building  
Washington, DC 20510

The Honorable Maria Cantwell  
Ranking Member  
Senate Committee on Energy &  
Natural Resources  
304 Dirksen Senate Office Building  
Washington, DC 20510

Dear Chairwoman Murkowski and Ranking Member Cantwell,

Puget Sound Energy, Inc. (PSE) appreciates the opportunity to provide comments regarding the Committee's work to craft a comprehensive energy efficiency package. The role of energy efficiency cannot be underscored enough, and leadership by the federal government is critical for electric and natural gas utilities and our customers to continue down this path. As the Committee considers energy efficiency legislation, PSE supports the inclusion of S. 1029, related to natural gas furnaces, in a final package that comes before the Senate Energy and Natural Resources Committee.

PSE is Washington State's oldest and largest electric and gas utility, serving more than 1 million electric customers and 750,000 natural gas distribution customers in ten counties. We have a strong record when it comes to energy efficiency. PSE provides our customers with a variety of services and incentives to help our customers save energy and money – it is part of our past, present and future. Over the past 35 years, our energy-efficiency programs have helped PSE customers conserve nearly 5 billion kilowatt hours of electricity and almost 50 million therms of natural gas. What's more, over the next two decades, we see the potential to help our customers save another 440 average megawatts of electricity and 70 million therms of natural gas.

As you are aware, the Department of Energy (DOE) has issued a rulemaking to raise energy conservation standards for residential furnaces. Various stakeholders have raised concerns about unintended consequences of this rule. Specifically, the proposed rule will effectively raise the purchase price and installation costs of an efficient natural gas furnace. By its own analysis, the DOE estimates that customers could bear between \$6 and \$12 billion in new costs associated with higher efficiency furnaces. In addition to the impact on customers, the top-down approach this rule prescribes has significant impacts on homebuilders and furnace manufacturers.

While PSE supports energy efficiency market transformation developments, we believe there is a workable solution to which stakeholders can agree if a more thorough analysis of this rule and its impacts is conducted. The legislation introduced by Senator Hoeven (S. 1029), requiring the DOE to convene an advisory group of interested stakeholders to more deeply analyze the rule and understand the consequences, is a step in the right direction. It is critical that the DOE

401

The Honorable Lisa Murkowski  
The Honorable Maria Cantwell  
April 27, 2015  
Page 2

considers the full implications that this rule will have on the way Americans heat their homes, and commit to developing a rule that aligns with our shared goals of environmental protection and economic advancement. PSE urges the Senate Committee on Energy and Natural Resources to approve this important bill.

Thank you for your consideration of PSE's perspective. Please feel free to contact me at (425) 462-3897 for further information.

Sincerely,

A handwritten signature in cursive script that reads "Kimberly Harris".

Kimberly J. Harris

May 14, 2015

The Honorable Lisa Murkowski  
Chair  
Committee on Energy & Natural Resources  
U.S. Senate

The Honorable Maria Cantwell  
Ranking Member  
Committee on Energy & Natural Resources  
U.S. Senate

RE: Statement for the record on the Energy Savings and Industrial Competitiveness Act of 2015 (S. 720).

Our organizations represent a broad sector of the residential and commercial construction and real estate industry, including builders, developers, Realtors®, property managers, and product manufacturers. We support many of the goals of The Energy Savings and Industrial Competitiveness Act of 2015 (S. 720). We seek to ensure that the bill encourages meaningful energy savings for residential and commercial construction that are achievable and cost-effective. To that end, we appreciate this opportunity to suggest improvements to section 101 of S. 720, entitled “Greater Energy Efficiency in Building Codes.”

Model building energy codes and standards such as the International Energy Conservation Code (IECC) and ASHRAE 90.1 are used across the country to establish minimum standards for building energy efficiency. The codes and standards are developed by private entities, updated every three years, and adopted by state and local governments. Once adopted by a state or locality, the code typically becomes a regulatory baseline requirement for all buildings in that jurisdiction.

The Department of Energy (DOE) can be an effective participant in the development of model energy codes by providing technical assistance to analyze energy savings. As a general matter, section 101 of S. 720 improves this process by increasing transparency within DOE. However, we suggest additional safeguards to prevent DOE from picking “winners or losers” in advocating for specific products or technologies. Further, we recommend safeguards to ensure that DOE does not seek code revisions that are not cost effective.

Consumers deserve a reasonable return on their investment when it comes to required energy efficiency improvements. Failure to consider the true costs of energy-use reductions and establish a reasonable payback period for these investments will exacerbate the shortage of affordable housing as well as increase compliance costs for commercial landlords and many of their tenants. In the commercial building space, DOE’s participation in the codes development process should reflect energy-efficiency investments that consider metrics such as reasonable simple payback periods and the “time value of money.”

With these larger points in mind, we respectfully suggest the following changes to section 101:

***More Clarification is Necessary to Distinguish Between DOE’s Proper “Technical Assistance” Role and an Improper “Advocacy” Role***

While it does not write or publish the model building energy codes, DOE participates in their development by providing technical assistance. We recognize that the building science research, energy modeling and analysis that DOE offers – using its expertise and legislative authority – are important to the IECC and ASHRAE processes. But we are concerned that “technical assistance” has been broadly

interpreted to allow DOE representatives to advocate for or against certain technologies, picking winners and losers, and seeking aggressive and costly requirements.

Some businesses support inserting specific products into the code to effectively mandate their use and increase their profits. Instead of allowing the builder/developer to make decisions in the best interests of the buyer, the energy codes dictate specific construction methods and which products to use. In addition, DOE has attempted to hire outside consultants to provide advocacy assistance.

For example, in the 2012 IECC, DOE proposed to prescriptively require foam sheathing, a specific type of insulation. This proposal eliminated the ability to use more cost-effective construction materials and methods. Conversely, DOE did not support an NAHB proposal that would have increased flexibility by allowing builders to trade off efficiency measures—wall insulation, for example—provided they install more efficient mechanical equipment.

Section 101 of S. 720 makes some key improvements in the development of model building energy codes by requiring DOE to publish energy savings targets and supporting analysis in the Federal Register. It also sets some of the guidelines by which DOE operates in this context. This will go a long way towards increasing transparency and ensuring that the public is heard. To further improve Section 101, we recommend additional safeguards to prevent DOE from crossing the line into “advocacy” and ensure development of product-neutral, cost-effective building energy codes.

***Cost-effectiveness of Building Energy Codes should be Clarified with Reference to Reasonable Pay-Back Periods***

We understand and appreciate the value of energy savings to our members’ customers and consumers. While these savings are realized over time, they can only accrue after builders and developers make significant, upfront investments in energy-efficient products and technologies.

Regarding the residential sector, meeting the prevailing energy code is a baseline requirement for every single home, including low-income housing and homes for first-time home buyers. Increasing housing costs for all home buyers will have the unintended consequence of reducing housing affordability. For every \$1,000 increase in the price of a home, 246,000 households will be priced out of mortgage eligibility for a 30-year, fixed-rate mortgage with a 5% interest rate.

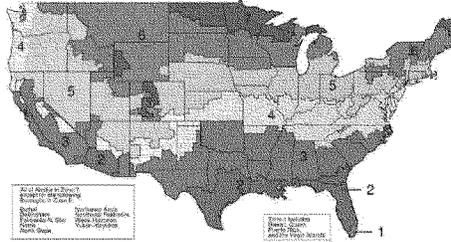
According to an NAHB market report, *What Home Buyers Really Want*, buyers are willing to pay for lower utility costs—but only with at least a 14 percent return, or a 7-year payback. Budget-conscious first-time home buyers require a 5-year payback period (attached). The 2012 version of the IECC included such significant cost increases that it would take the average family 13.3 years just to break even. Some climate zones saw payback periods in excess of 16 or 17 years (see graphic below). The average home owner does not stay in their home for this long and will never realize a return on their investment. DOE typically analyzes cost-effectiveness over the life of the building, which they define as 30 years. Some energy efficiency advocates also argue that the code should reflect a 30-year (or even longer) payback period, but this is simply not realistic.

Similarly, recent versions of the IECC would add thousands of dollars to the construction costs of each individual apartment residence in a multifamily building at a time when the U.S. is already suffering from a shortage of affordable housing (see table below). Research commissioned by the National Multifamily Housing Council (NMHC) and the National Apartment Association (NAA) on the compliance costs of the

2009 and 2012 IECC editions show the IECC is moving toward a heavy emphasis on building insulation and building envelope construction. There are considerable differences between compliance costs for the 2009 and 2012 codes as well as significant cost variance between low-and high-rise properties across climate zones. Notably, these cost differentials are not consistent across, or between, the code editions.

Table 8: 2012 IECC Cost Effectiveness Relative to 2009 IECC

Climate Zone	Annual Energy Savings	Incremental Construction Cost	Simple Payback (yrs)
1	\$206	\$3,224	15.7
2	\$294	\$3,330	11.3
3	\$470	\$7,203	15.3
4	\$410	\$7,091	17.3
5	\$505	\$4,653	9.2
6	\$397	\$6,399	16.1
7	\$609	\$6,465	10.6
8	\$725	\$6,465	8.9
<b>National Weighted Average</b>	<b>\$427</b>	<b>\$5,668</b>	<b>13.3</b>



<http://www.homeinnovation.com/~media/Files/Reports/Percent%20Energy%20Savings%202012%20IECC%20Cost%20Effectiveness%20Analysis.PDF>

**2012 IECC CODE COMPLIANCE COST PREMIUM PER APARTMENT UNIT**

2012 IECC: Low-Rise Multifamily Property Zones 1-4

	Zone 1	Zone 2	Zone 3 R-13 + R-5	Zone 3 R-20	Zone 4 R-13 + R-5	Zone 4 R-20
Total (Lap Siding)	\$481-\$582	\$585-\$728	\$2,767-\$3,297	\$1,822-\$2,159	\$2,712-\$3,201	\$1,767-\$2,064
Total (Brick)	\$481-\$582	\$585-\$728	\$2,093-\$2,546	\$1,822-\$2,159	\$2,038-\$2,450	\$1,767-\$2,064

2012 IECC: Low-Rise Multifamily Property Zones 5-8

	Zone 5	Zone 6 R-13 + R-10	Zone 6 R-20 + R-5	Zone 7 and 8 R-20 + R-5	Zone 7 and 8 R-13 + R-10
Total (Lap Siding)	\$530-\$632	\$2,567-\$2,940	\$2,567-\$3,013	\$2,567-\$3,013	\$2,276-\$2,681
Total (Brick)	\$530-\$632	\$1,969-\$2,271	\$1,893-\$2,262	\$1,893-\$2,262	\$1,678-\$1,814

2012 IECC: High-Rise Multifamily Property Zones 1-5

	Zones 1-3 R-20	Zones 1-3 R-13 + R-3.8	Zone 4 R-20	Zone 4 R-13 + R-3.8	Zone 5 R-20 + R-3.8	Zone 5 R-13 + R-7.5
Total (Lap Siding)	\$1,345-\$1,586	\$902-\$1,102	\$1,595-\$1,853	\$341-\$399	\$2,515-\$2,962	\$2,220-\$2,627
Total (Brick)	\$1,345-\$1,586	\$902-\$1,102	\$1,595-\$1,853	\$341-\$399	\$2,515-\$2,962	\$1,680-\$2,026

2012 IECC: High-Rise Multifamily Property Zones 6-8

	Zones 6 and 7 R-20 + R-3.8	Zones 6 and 7 R-13 + R-7.5	Zone 8 R-20 + R-10	Zone 8 R-13 + R-15.6
Total (Lap Siding)	\$2,515-\$2,962	\$450-\$538	\$4,928-\$5,723	\$341-\$399
Total (Brick)	\$2,515-\$2,962	\$450-\$538	\$4,302-\$5,047	\$341-\$399

Cost calculations are based on "Impact of the 2009 and 2012 International Energy Conservation Code in Multifamily Buildings", Niles Bolton Associates, Inc., March 2012. Costs reflect only the cost premium to comply with the new code versions relative to the previous code edition. Charts do not represent total code compliance costs. <http://www.nmhc.org/Content.aspx?id=6169>.

The commercial building sector requires an even shorter return on investment to bring the cost in line with commercial leasing structures (10 years or less). Many lenders require strict return on investment analyses. A Turner Construction Report, "2012 Green Building Market Barometer," indicated that 65% of commercial developers expect a payback period of 5 years or less (attached). A DOE report prepared by the Pacific Northwest National Laboratory, *Assessing U.S. ESCO Industry Performance and Market Trends: Results from the NAEESCO Database Project*, found that, in the context of Energy Service Companies (ESCOs), while institutional buildings can withstand a 7-year payback period for energy efficiency improvements, private, commercial buildings can only withstand a 3-year payback (attached). DOE's own report acknowledges that a 3-year return on investment is critical for any private investments in energy efficiency.

Moreover, payback from energy efficiency investments for commercial buildings, as a practical matter, must correlate to commercial mortgage financing practices. That is, building owners and banks would not make rational financial and capital expenditure decisions if payback on equipment investments exceed the terms of the underlying mortgage that finances the property. To this end, a congressional oversight panel (which convened during the recent financial crisis) addressed real estate sector fundamentals and found that commercial building mortgages generally range from 3-10 years in duration (after which the building is either sold or refinanced upon maturity of the initial mortgage).<sup>1</sup> More recent reports confirm that, since the recession, private equity lenders are seeking short-term commercial real estate loans with 3-year maturities, compared to a typical 10-year maturity generally offered by banks.<sup>2</sup> For purposes of energy codes, payback on energy efficiency equipment in a mortgaged building should logically correlate to how that same structure is financed. A 30-year codes payback (such as one calculated under a "life-cycle cost-effective" standard) is not realistically tethered to market conditions where commercial mortgages have a financing horizon of 10 years or less.

Accordingly, we believe it is a fair compromise for S. 720 to include language that prevents the federal government – acting through DOE – from offering or supporting building energy code revisions that exceed a simple payback period of 10 years or more.

Thank you for the opportunity to submit these comments. Our organizations appreciate the willingness of the Committee, and S. 720's sponsors, to consider our perspectives.

---

<sup>1</sup> <http://cybercemetery.unt.edu/archive/cop/20110402035627/http://cop.senate.gov/documents/cop-021110-report.pdf> (pp. 2, 68-69).

<sup>2</sup> <http://www.costar.com/News/Article/Big-PE-Players-Among-Most-Active-Buyers-and-Lenders-for-Commercial-Property/169789>.

Sincerely,

Building Owners and Managers Association (BOMA) International

International Council of Shopping Centers

NAIOP, the Commercial Real Estate Development Association

National Apartment Association

National Association of Home Builders

National Association of REALTORS®

National Multifamily Housing Council

The Real Estate Roundtable

cc: The Honorable Rob Portman  
The Honorable Jeanne Shaheen  
U.S. Senate



1700 N. Moore Street, Suite 2250, Arlington, VA 22209  
Phone: (703) 841-2300 Fax: (703) 841-1184  
Email: [info@rila.org](mailto:info@rila.org) Web: [www.rila.org](http://www.rila.org)

April 28, 2015

The Honorable Jim Risch (ID)  
U. S. Senate  
483 Russell Senate Office Building  
Washington, D.C. 20510

Dear Senator Risch:

On behalf of the Retail Industry Leaders Association (RILA), I write in support of S. 1038. RILA is the trade association of the world's largest, most innovative and recognizable retail companies and brands. Our membership includes more than 200 retailers, product manufacturers, and service suppliers, which together account for more than \$1.5 trillion in annual sales, millions of American jobs and more than 100,000 stores, manufacturing facilities and distribution centers domestically and abroad.

For more than 20 years, ENERGY STAR has been a highly successful voluntary program designed to promote the development of energy efficient products. The ENERGY STAR program is popular with retailers and our customers who are interested in accessing a wide variety of affordable and efficient appliances and electronics. As a voluntary program, ENERGY STAR promotes economic growth and energy security while helping reduce pollution.

S. 1038 addresses a gap in the law that enables follow-on private lawsuits against retailers and manufacturers in the event that a product is disqualified from the program. These lawsuits are a costly and unnecessary addition to the Environmental Protection Agency's (EPA) existing ENERGY STAR enforcement apparatus, and threaten to undermine the ENERGY STAR program by making voluntary participation by manufacturers, retailers, and consumers too expensive. S. 1038 protects consumers, codifies the existing EPA enforcement process, and promotes continued broad participation in the ENERGY STAR program.

S. 1038 ensures that retailers and our customers can continue to enjoy a variety of energy efficient products. Without this bill, reduced participation in the ENERGY STAR program would mean fewer energy efficient product offerings from manufacturers, and may make the remaining ENERGY STAR products more expensive. Consumers also benefit from the ongoing energy savings and environmental protection that comes with a robust ENERGY STAR program. While reduced rates of participation in the ENERGY STAR program would slow the rate of innovation, high rates of participation in the ENERGY STAR program give the federal government increased flexibility to raise ENERGY STAR standards even further, encouraging manufacturers to voluntarily invest in energy efficient technologies.

Again, thank you for your leadership on this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "Jennifer M. Safavian". The signature is fluid and cursive.

Jennifer M. Safavian  
Executive Vice President, Government Affairs

**STATEMENT BY SENATOR SANDERS**

**On the Residential Energy Savings Act as part of the Hearing on the Energy Efficiency Title of the Senate Energy Bill**

ENR Legislative Hearing on Energy Efficiency

*April 30, 2014 at 10 am*

There are clearly differences of opinion among members of this committee on which particular energy policies we should be pursuing. But I think that we can all agree that encouraging and promoting energy efficiency in our homes just makes good sense, and I thank the Chairwoman for calling this hearing today.

According to a recent study by the Lawrence Livermore National Laboratory, more than 60% of the total energy produced in the United States is wasted due to inefficiency. So, I would hope that, regardless of one's political perspective, we could all move forward together to advance more efficient ways to use energy. Increasing our energy efficiency is clearly the first step in ensuring our country's energy security.

If there were ever a win-win-win solution for advancing our energy policy, energy efficiency is it: we lower the energy costs for millions of Americans, we reduce our greenhouse gas emissions, and we create tens and tens of thousands of jobs in our country. It is for these reasons that I support the efforts of my colleagues, in particular Senators Shaheen, Portman, and Coons, who also have energy efficiency bills before the Committee today. The other bills being considered today will increase the energy efficiency in Federal buildings, schools, and libraries – all places that would benefit from such upgrades..

The bill I am offering today complements these other proposal and focuses on *residential* energy efficiency. My bill addresses a critical issue – that all over this country, there are tens of millions of people who understand they are wasting energy and would like to fix that. According to the National Association of Home Builders, more than 40% of the homes in this country are more than 40 years old. They are wasting a lot of energy. People are spending much more money than they should.

When it gets cold, valuable heat is going through their roofs, through their windows, and through their walls instead of keeping them warm. This is a huge waste of energy, and a huge waste of money for consumers. Unfortunately, many families don't have the money to make the modest investments their homes that are needed to make them more energy efficient. My bill, the Residential Energy Savings Act, would address that very problem.

The Residential Energy Savings Act will save money for homeowners and tenants and cut energy use by lowering the upfront cost of energy efficiency upgrades. It will also create jobs for installers and for the companies that manufacture windows, insulation, and other energy efficiency materials.

The way my bill would work is pretty simple. This bill makes loans available to states through the Department of Energy's State Energy Program. The states, in turn, make these funds available homeowners and tenants to finance energy efficiency projects. Homeowners then pay back the loans through their energy savings, with the money eventually coming back to the Treasury.

In other words, we lend somebody \$15,000 to make their home more energy efficient. They save \$1,000 a year. They pay back the loan by those savings in their fuel bill. At the end of the day – or in 15 years in this example – they are not

paying any more for fuel, but in the 16th year they are going to see significant savings in their bill, and throughout the process we see significant reductions in greenhouse gas emissions. In addition, we have created jobs for those in the installation and manufacturing sectors.

Another great aspect of this bill is the tremendous amount of flexibility that it gives both to the states and to residents making energy efficient upgrades. States can choose to support existing programs or to design new ones that best fit their own circumstances and needs. People will make their own choices about how they want to go forward with energy efficiency retrofits, making the best choices for their own home. There are no mandates. Participation is entirely voluntary.

This flexibility for developing innovative financing mechanisms for energy efficiency is something that states can use to great effect to augment what they are already doing or to foster more investment.

In Vermont, for example, utility-run electric energy efficiency programs are meeting more than 13% of the state's electricity needs. These programs are meeting these needs at half the cost of comparable supply resources. Energy efficiency has also helped Vermonters to avoid over \$280 million in transmission and distribution investments – savings that benefit all ratepayers.

Vermont is also home to Efficiency Vermont, the first energy efficiency utility in the country. This utility uses energy efficiency financing initiatives to great effect, providing loans to homes, businesses and schools through various loan programs. The Residential Energy Savings Act would give those states like Vermont that have existing programs in place the ability to access additional low-cost financing for residential retrofits.

My bill is supported by the American Council for an Energy-Efficient Economy, the North American Insulation Manufacturers Association, the National Association of State Energy Officials, and the National Association for State Community Services Programs.

In closing, I would like to share one story with my colleagues. I will never forget doing an event with two sisters from Barre, VT, both of whom were in their eighties. Because of one of the State's weatherization programs, they had reduced the cost of their fuel bill by something like 50 percent. Their home was much more comfortable.

This is what we should be doing all over this country, and I believe that these are the sorts of policies that every member of this committee could support.

April 30, 2015

The Honorable Lisa Murkowski  
Chairwoman, Committee on Energy  
and Natural Resources  
United States Senate

The Honorable Maria Cantwell  
Ranking Member, Committee on Energy  
and Natural Resources  
United States Senate

**RE: S. 720 §433 – Sensible Accounting to Value Energy (SAVE) ACT PROVISIONS**

Dear Senators Murkowski and Cantwell:

The undersigned group of manufacturers, builders, business groups, and energy efficiency advocates write today to express our support for one of the most valuable provisions in S. 720 known as the Sensible Accounting to Value Energy Act, or SAVE Act (§433). The provision seeks to improve the energy efficiency of homes by providing a voluntary means of financing energy efficient features and improving the accuracy of mortgage underwriting by federal mortgage agencies.

Manufacturers and builders are continually innovating new energy efficient products and features, but current mortgage underwriting processes and appraisals do not fully consider the costs and value of energy efficient features in a home. Therefore these money and energy saving features are not making their way into new homes. Passing the SAVE Act will unlock manufacturing demand for innovative new products and significantly reduce homeowners' utility bills.

With no new subsidies, mandates, or bureaucracies, the SAVE Act would bring transparency, accuracy, and security to the home appraisal and mortgage underwriting processes, help finance energy efficient homes and retrofits, and create vitally needed jobs in local markets.

Since over 90% of the mortgages originated in the U.S. are through Federal Government entities such as FHA, VA, Fannie Mae and Freddie Mac, the SAVE Act will provide the policy guidance needed to overcome bureaucratic inertia.

Given the SAVE Act's benefits for the economy, jobs, American manufacturing, and consumers, the undersigned members of the coalition ask for your support of this important legislation. Thank you for your consideration.

Sincerely,

Alliance for Environmental Sustainability  
Alliance to Save Energy  
American Chemistry Council  
American Council for an Energy-Efficient Economy  
ASHRAE  
BASF Corporation

Bayer Material Science  
Building Industry Policy Roundtable  
CertainTeed  
Community Home Energy Retrofit Project (CHERP)  
Danfoss  
Digital Energy & Sustainability Solutions Campaign (DESSC)  
Efficiency First  
Elevate Energy  
Energy Efficient Codes Coalition  
EnergyLogic Inc.  
Environmental and Energy Study Institute  
Environmental Defense Fund  
Extreme Panel Technologies  
Green Builder Coalition  
Green Builder Media  
Home Performance Coalition  
Insulation Contractors Association of America (ICAA)  
International Code Council  
Johns Manville, a Berkshire Hathaway Company  
Knauf Insulation  
Leading Builders of America (LBA)  
LTLB Envirotecture  
LTLB Renovate  
National Association of Energy Service Companies  
National Association of Home Builders (NAHB)  
National Association of Manufacturers  
National Association of the Remodeling Industry  
National Association of State Energy Officials  
National Housing Conference  
Natural Resources Defense Council  
North American Insulation Manufacturers Association  
Northeast Energy Efficiency Partnerships (NEEP)  
Owens Corning  
PFB Corporation  
PorterWorks  
Residential Energy Services Network (RESNET)  
ROXUL  
Southern Energy Management  
The Dow Chemical Company  
The Real Estate Roundtable  
U.S. Chamber of Commerce  
U.S. Green Building Council (USGBC)

cc: Members of the Senate Committee on Energy & Natural Resources  
Senator Johnny Isakson  
Senator Michael Bennet



April 30, 2015

**Committee on Energy & Natural Resources  
United States Senate**

**Testimony of  
Nathan J. Diament,  
Executive Director for Public Policy –  
Union of Orthodox Jewish Congregations of America**

**In support of S.600  
Nonprofit Energy Efficiency Act of 2015**

Chairman Murkowski, Ranking Member Cantwell and members of the Committee – I am pleased to submit the following testimony in support of S.600, the Nonprofit Energy Efficiency Act, which is before the Committee for mark up today on behalf of the Union of Orthodox Jewish Congregations of America.

Our organization strongly supports S.600 – the Nonprofit Energy Efficiency Act – sponsored by Senators Klobuchar and Hoeven, as well as Senators Risch, Stabenow, Blunt, and Schatz. We appreciate your consideration of this legislation today.

We are pleased that this important legislation is also supported by a diverse coalition of faith-based and other nonprofit sector groups – including the U.S. Conference of Catholic Bishops, the National Council of Churches, the YMCA Association of the USA, the Association of Art Museum Directors, Interfaith Power & Light, the Jewish Federations of North America, and more.

As you know, our organizations – and so many others in the nonprofit sector – provide an array of social welfare, educational, recreational and communal services across this country to people from all walks of life. But across the diversity of services we provide and citizens we serve, we have at least one thing in common – our job training workshops, English language classes, soup kitchens, clothing co-ops, tutoring sessions, homeless shelters, health clinics and more all take

place in buildings. Some of those buildings are quite old and drafty, but they must be warmed in the winter and cooled in the summer.

According to the EPA, nonresidential buildings in the United States consume more than \$200 billion annually in energy costs. Among those many buildings, are this county's 2700 YMCAs, 2900 nonprofit hospitals, 17,000 museums and more than 370,000 houses of worship. Looking just at the houses of worship sector -- the EPA, based on its "Green Congregations" project,<sup>1</sup> estimates that these entities could cut their energy use -- and costs -- by one third through energy efficiency improvements. If America's houses of worship cut their energy use by just ten percent, the EPA estimates that would save 1.8 billion kWh of electricity and 1.3 million tons of greenhouse gas emissions, equivalent to the emissions of 240,000 cars.

We are eager to achieve these results by updating and replacing outdated and inefficient heating and cooling systems, lighting and other electrical systems, windows and doors and more. Unfortunately, the "front end" costs to make these improvements and retrofits are very high. For nonprofit charities, the hurdle of these front end costs is even higher to surmount because we cannot just raise the prices of the widgets we sell or take on greater debt to finance them. And, candidly, a new HVAC unit or boiler is not the most exciting project to pitch to even deeply dedicated donors to our institutions.

Moreover, while there have been (and still are) a variety of state and federal financial incentives for making energy efficiency retrofits, they are typically in the form of tax credits and rebates -- which are, of course, unavailable to tax exempt, non-profit charities.<sup>2</sup>

---

<sup>1</sup> [http://www.energystar.gov/index.cfm?c=small\\_business.sb\\_congregations](http://www.energystar.gov/index.cfm?c=small_business.sb_congregations)

<sup>2</sup> At the federal level, the Energy Policy Act of 2005 enacted Section 179D of the Internal Revenue Code, providing a one-time accelerated depreciation for commercial, multifamily, and public agency owned facilities; there are also federal tax credits available for residential homeowners installing energy efficiency improvements [http://www.energystar.gov/index.cfm?c=tax\\_credits.tx\\_index](http://www.energystar.gov/index.cfm?c=tax_credits.tx_index)

This is why we are supporting the Hoeven - Klobuchar proposal which will create a pilot program in the Department of Energy to award financial grants to nonprofits for energy efficiency building improvements.

Under S.600, nonprofits could apply for grants for up to 50% of the cost of an energy efficiency retrofit project – with a maximum grant amount of \$200,000. The legislation authorizes an appropriation of \$10 million for each of the fiscal years 2016-2020, and identifies an offset for those funds.

We are confident that making these funds available – in a cost sharing program – will enable nonprofits to raise or borrow the balance of the funding needed for an energy efficiency project, and thus leverage public funds as they should.

We also suggest that S.600's program would be a catalyst for job creation as nonprofits would finally be able to undertake deferred projects and generate the demand for new HVAC systems, windows and insulation as well as the contractors and workers to install them.

Finally, the federal investment in the nonprofit sector's energy efficiency will be leveraged through our sector's social capital to generate greater private action and investment toward energy efficiency. As was stated in 2010 by the President's Advisory Council on Faith Based Partnerships:

Houses of worship can exert a powerful influence when they practice good energy stewardship.... Similarly, actions taken by nonprofit organizations can serve as an important role model for their employees, volunteers, and beneficiaries. There is a multiplier effect as congregants and nonprofit participants adopt the energy-saving practices in their homes and businesses.<sup>3</sup>

Senators – the Orthodox Union and our coalition partners appreciate and support your efforts to enact broad and impactful energy efficiency legislation, including the various other bills before the Committee today, as well as other legislation pending in the Senate.

---

<sup>3</sup> **Report and Recommendations to the President; Environment & Climate Change --**  
<http://www.whitehouse.gov/sites/default/files/partnerships-environment-climate-change.pdf>

Improving America's energy efficiency is, in our view, critical for the long term welfare of our nation's environment and economy; and we hope you recognize and support S.600 – aiding the nonprofit sector -- as a complementary effort to these other bills.

But if I may, I would like to conclude with an important note – that improving energy efficiency and reducing harmful pollution is not just a matter of the economy and the environment. From our perspective, it is also a matter of values.

God charged us with the mission to be His partner in creation – to “work” the earth; But God also charged us to “preserve” it. (Genesis 2:15)

As you, Senators, work to enact legislation to help us be good stewards of our energy resources and environment, you are serving this mission as well.

And for that, we thank you.



THE UNITED STATES CONFERENCE OF MAYORS

1620 EYE STREET, NORTHWEST  
WASHINGTON, D.C. 20006  
TELEPHONE (202) 293-7330  
FAX (202) 293-2352  
URL: [www.usmayors.org](http://www.usmayors.org)

**Statement of the  
The United States Conference of Mayors**

**Submitted to the  
Senate Energy and Natural Resources Committee**

**Submitted on May 12, 2015**

**By  
CEO and Executive Director  
The United States Conference of Mayors  
Tom Cochran**

The United States Conference of Mayors (USCM) appreciates the opportunity to submit this statement for consideration by the Senate Energy and Natural Resources Committee as it considers comprehensive energy policy.

USCM is the official nonpartisan organization that represents cities with populations of 30,000 or more. There are more than 1,300 such cities in the country today, each represented in the Conference by its chief elected official, the Mayor.

USCM commends the Chairmen, Ranking Member and Members of the Committee for holding hearings on the critical issue of comprehensive energy policy. America today produces a larger share of its energy than it has in many decades, an achievement made possible in part by the improving efficiency of local energy use and the deployment of more home-grown renewable energy in our cities.

USCM and its members strongly support your efforts to develop a comprehensive energy bill and we ask that you include reauthorization of the Energy Efficiency and Conservation Block Grant (EECBG) Program in the bill.

A February 2014 U.S. Conference of Mayor's report examines how cities invested their formula grant funds to further their local energy and climate protection efforts. It finds that "most mayors directed a majority of their EECBG funds to investments in municipal projects and operations."<sup>1</sup> More than 85 percent of the cities surveyed reported that they expended a majority of their EECBG grant dollars on municipal projects and operations, such as improving city-owned buildings, upgrading streetlights, or deploying renewable energy with the remaining 13 percent investing in non-municipal programs, such as loans, rebates or programs benefiting homeowners and businesses.<sup>2</sup>

Mayors across this country have implemented many innovative programs and see comprehensive energy legislation as an important catalyst in expanding these efforts to reduce energy use through greater energy efficiency and conservation, deploying new energy technologies especially renewable energy systems and curbing harmful energy emissions, which are already underway in communities all across the nation. The report highlights that of the technologies already deployed more than 82 percent of the cities made LED/other energy-efficient lighting their top choice. Even the city of Fairbanks, AK converted all interior fluorescent lighting in two main operating facilities to energy efficient LED lighting, achieving an estimated 63 percent reduction in energy consumption.

Cities have been the laboratories of innovation, successfully pioneering and demonstrating cost-effective clean energy solutions, including increasing energy efficiency for public and private buildings, encouraging energy independence through the use of alternative energy sources, switching their fleets to alternative fuels and more fuel efficient vehicles; and building alternative infrastructure to encourage their citizens to utilize other forms of greener transportation. The flexibility of the block grant structure allows cities and other local governments to tailor solutions to their own communities' needs, which is especially important in the energy and climate arenas.

---

<sup>1</sup> See attached U.S. Conference of Mayors Report on *Successful City Initiatives with Energy Efficiency and Conservation Block Grant (EECBG) Funding*

<sup>2</sup> Id. at 4.



Mayors Climate Protection Center

# Successful City Initiatives with Energy Efficiency and Conservation Block Grant (EECBG) Funding

A 204-City Survey

February 2014



THE UNITED STATES CONFERENCE OF MAYORS



**THE UNITED STATES  
CONFERENCE OF MAYORS**

**Scott Smith**  
Mayor of Mesa  
President

**Kevin Johnson**  
Mayor of Sacramento  
Vice President

**Stephanie Rawlings-Blake**  
Mayor of Baltimore  
Second Vice President

**Shane Bemis**  
Mayor of Gresham  
Chair, Energy Committee

**James Brainard**  
Mayor of Carmel  
Co-Chair, Energy Independence and  
Climate Protection Task Force

**Bill Finch**  
Mayor of Bridgeport  
Co-Chair, Energy Independence and  
Climate Protection Task Force

**Greg Stanton**  
Mayor of Phoenix  
Chair, Environment Committee

**Tom Cochran**  
CEO and Executive Director

The U.S. Conference of Mayors is the official nonpartisan organization of cities with populations of 20,000 or more. There are 1,398 such cities in the country today, each represented in the Conference by its chief elected official, the Mayor.

**DO YOUR PART! PLEASE RECYCLE!**

## Foreword



**Tom Cochran**  
CEO and Executive Director  
The United States  
Conference of Mayors

It was just about five years ago that The U.S. Conference of Mayors and the nation's mayors persuaded Congressional and Administration leaders to authorize and then fund the Energy Efficiency and Conservation Block Grant (EECBG) Program. In late 2007, Congress authorized a five-year, \$10 billion commitment to cities, counties and states, providing for new federal investment in local energy and climate initiatives as part of the *Energy Independence and Security Act* (P.L. 110-140). About a year later in early 2009, President Barack Obama and Congressional leaders made the EECBG Program a top funding priority in the *American Recovery and Reinvestment Act* (P.L. 111-5).

Appropriating \$2.7 billion in formula grant funds (to be distributed directly to cities, counties, states and tribal governments) and another \$400 million in discretionary grants (to be awarded competitively by the U.S. Department of Energy), a new and expanded federal/local partnership to further locally-directed energy efficiency and renewable energy initiatives was launched. It has been a journey since that time – working to recover from such a deep economic recession and having to respond to significant federal budgetary constraints affecting all domestic activities, including energy.

These survey findings provide just a glimpse of the important changes now underway in our cities, driven by local energy innovations championed by mayors in every part of this great nation. These mayoral "best practices" we so often share at the Conference of Mayors and our work on surveys to compile a broader picture of city-based initiatives only scratch the surface of what has been achieved locally by this significant, although one-time, infusion of EECBG resources directly into cities.

The very positive results reported in this survey challenge the Conference of Mayors and its members to continue to tell the story of why sustained mayoral leadership is so important to the nation's efforts to find cleaner and safer energy solutions for the future. Recent national data also indicate that our many actions, including mayoral energy initiatives, are making a difference. America today produces a larger share of its energy than it has in many decades, an achievement made possible in part by the improving efficiency of local energy use and the deployment of more home-grown renewable energy in our cities. America is getting more economic output from each unit of energy, and carbon emissions are declining faster than experts predicted just a few years ago. And, we see changes every day in our cities, whether it is less energy to light, heat and cool our buildings, new renewable technologies powering our energy needs, or the fewer miles driven or less gas consumed to make our many daily trips.

We have started the journey toward a cleaner energy future where mayors and their cities are key drivers in getting us there faster. We welcome any and all partners to join mayors in this effort, and respectfully request the Federal government to take another look at renewing commitments to city- and local-based energy action, by providing additional EECBG funding and taking other actions to support mayors and other local leaders.



## Survey Results

More than two-thirds of all mayors participating in The U.S. Conference of Mayors' 2014 energy efficiency and technologies survey provided information on their city's use of formula grant funding under the Energy Efficiency and Conservation Block Grant (EECBG) Program.

The Conference of Mayors "conceived" the EECBG Program to engage the Federal government in supporting the nation's mayors in accelerating local energy and climate initiatives, especially the more than 1000 mayors who have joined as signatories to the Conference's Mayors Climate Protection Agreement. Of the \$2.7 billion to the program for formula grants, nearly half of these EECBG funds (\$1.3 billion) were allocated directly to cities; the average EECBG formula grant to cities was about \$1 million.

In 2009, as part of the *American Recovery and Reinvestment Act*, this U.S. Department of Energy-administered program distributed \$2.7 billion in formula grants (largely based on population) directly to:

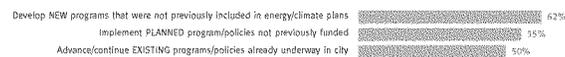
- Cities with a population of 35,000 or more (including some cities below this population threshold depending on the state);
- Counties with a population of 200,000 or more (including some counties below this population threshold depending on the state);
- States to allocate funds to cities and counties not receiving direct formula funding; and
- Tribal governments.

Specifically, 204 of 288 mayors – representing cities of all population sizes and from all regions of the country – responded to a series of questions designed to document how this direct funding helped further city initiatives to reduce energy use through greater energy efficiency and conservation, deploy new energy technologies especially renewable energy systems and curb harmful energy emissions, among other local outcomes.

This report and its findings provide an overview of the EECBG Program, highlighting generally how cities invested their formula grant funds to further their local energy and climate protection efforts.

A sizable majority of mayors used all or some portion of their EECBG funds to develop NEW programs rather than allocating funds to already PLANNED and/or EXISTING city programs and policies. More than six in ten cities (62%) invested EECBG resources in developing new programs that were not previously included in city energy and climate plans, followed by smaller majorities choosing to implement planned programs and policies not previously funded (55%) or advance/continue existing programs and policies already underway in the city (50%).

### Use of EECBG Funds for NEW, PLANNED and/or EXISTING Programs (percentage of cities)



Survey Results

In addition, one in five cities (21% of all respondents) used their EECBG grants exclusively for new programs not previously included in their energy and climate plans. For the half which invested in existing programs and policies, almost six in ten of them (58%) committed some share of their EECBG funds to new programs. Only about one in seven cities (14%) directed all of their funds to existing programs and policies.

This emphasis on new programs is notable because the prevailing view at the time was that many cities would simply substitute EECBG dollars for allocated local funding to existing city energy initiatives.

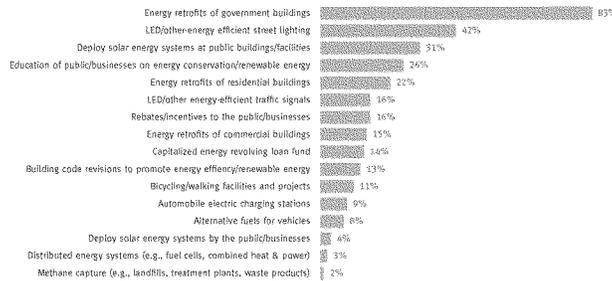
Most mayors directed a majority of their EECBG funds to investments in municipal projects and operations. Nearly seven in eight mayors (87%) expended a majority of their EECBG grant dollars on municipal projects and operations, such as improving city-owned buildings, upgrading streetlights, or deploying renewable energy; the remaining 13 percent of cities invested a majority of their funds in non-municipal programs, such as loans, rebates or programs benefiting homeowners and businesses.

When asked how EECBG dollars were invested in their cities, mayors were given 16 project/programmatic choices, categories that largely followed those set forth in the federal law (*Energy Independence and Security Act of 2007*) that authorized the EECBG program. While the category of government building retrofits was the top choice, the chart below illustrates the range of activities that mayors pursued in their efforts to promote greater energy conservation, improve energy efficiency and/or advance renewable energy supplies in their cities. In addition to retrofitting government buildings, more than four in ten cities (42%) invested EECBG dollars in LED/other energy-efficient street lighting, and about one in six cities (16%) invested in LED/other energy-efficient traffic signals. Nearly one-third of the cities (31%) used these flexible funds to deploy solar energy systems at public buildings and public facilities.

While some projects are generally considered municipal in scope, they are often designed to serve residents and businesses directly. Examples of these investments, as shown in the chart below, are electric charging stations for automobiles, bicycling projects, or city education campaigns designed to help inform the public and businesses about energy conservation measures or ways to deploy renewable energy systems.

How Did Cities Use EECBG Funds

(percentage of cities)



## Survey Results

In addition to selecting from these pre-set categories, survey respondents could offer written descriptions of local projects/programs funded by EECBG dollars. Cities described a range of activities, from relighting parks and garages with LEDs to some unique energy initiatives.

EECBG funds in one city underwrote a neighborhood-based project, whereby energy technicians targeted underserved neighborhoods and retrofitted homes with energy conservation measures.

With its funds, one city undertook a lighting retrofit of its convention center, including installation of a green roof. Another city developed a program to provide for comprehensive audits for private commercial buildings in the downtown core that were predominately vacant; others used ENERGY STAR's Portfolio Manager to benchmark city-owned buildings and to support benchmarking efforts by commercial building owners. One city used some of its funds to modernize its development practices and rules to make it easier for businesses and homeowners to install renewable energy systems.

Among other renewable energy projects, a city installed a 135 kw windmill at an existing sports complex, and another installed a 100 kw wind turbine on top of a city building. A few cities cited acquired solar-powered garbage/recycling containers, while another installed solar water heaters on its city buildings. A city traffic signal optimization program, with solar-powered street crossing beacons, was also funded with these resources.

One city funded the construction of a central energy plant that now serves a high school, middle school and a civic center. Among several IT projects, conserving energy in one city will be easier now with installation of software that automatically shuts down city PCs at night as well as during weekends and holidays.

Workforce training initiatives also received some EECBG funding, with one city training private sector officials on energy efficiency and building rating. Another city developed a program for trades interns to train them on the installation of energy efficient technologies. One city paid for consulting services to be available to owners of industrial/manufacturing properties, helping them identify ways to cut energy waste and other production inputs.

Although some cities reported challenges in securing federal approvals, one city noted its geothermal project, funded with EECBG resources, which is now producing energy for the city.

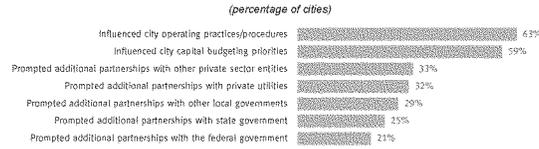
Although not a primary use of these funds, many cities directed resources to updating comprehensive plans and other specialized plans to reduce energy use, promote sustainability and/or advance climate action. Some invested in new city energy management systems, while others undertook greenhouse gas inventories, including developing emission reduction strategies. Finally, some unique projects included a feasibility study to convert grease to fuel and an evaluation of potential energy projects to be funded through a newly-established energy improvement district.

While not an area of inquiry in this survey, a 2010 Conference survey, *Mayoral Survey on Implementation of the Energy Efficiency and Conservation Block Grant (EECBG) Program*, did query cities on the entities delivering EECBG-funded projects, whether they were municipal or non-municipal in nature. Cities reported then that more than three-quarters (77%) of all grant funds would be passed through to private firms.

Survey Results

The availability of EECBG funds to cities has influenced city budgetary priorities, and also prompted new partnerships with a range of private sector and governmental entities. More than six in ten mayors (63%) said EECBG resources influenced city operating practices and procedures, with almost the same share (59%) indicating that this direct federal funding influenced city capital budgeting priorities. About one in three cities said EECBG funds prompted additional partnerships with private utilities (32%), with other private sector entities (33%) and with other local governments (29%).

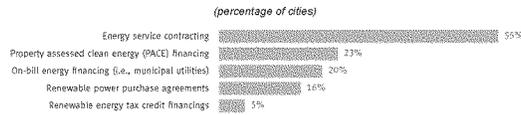
**How EECBG Funds Influenced Budgets and Prompted New Partnerships**



The “leverage” that comes from this relatively modest infusion of federal resources directly into the nation’s larger cities and counties can’t be overstated, considering the enormity of local operating and capital budgets. According to the U.S. Census and its 2011 *State and Local Government Finances* report, all local governments – cities, counties, towns and special districts – expended \$1.3 trillion for current operations, with another \$220 billion in capital outlays, with the direct EECBG formula recipients accounting for a substantial share of these expenditures.

A majority of mayors cited energy service contracting as the innovative energy financing strategy that EECBG funds helped most often. For cities responding to this question, energy service contracting was the top choice (55%) among energy financing strategies that benefited most from the availability of EECBG grant dollars. The next two choices – property assessed clean energy (PACE) financing and on-bill energy financings – were chosen by about one in five cities.

**How EECBG Funds Advanced Innovative Energy Financing Strategies**



The dominance of energy service contracting among financing strategies is another example of how the conventional wisdom can miss the mark. During the ARRA debate, some private sector firms and their organizations claimed that funding the EECBG Program would discourage cities from utilizing this financing option, commonly called ESCO financing; as the findings of this report show, the availability of EECBG resources had the opposite effect.

Survey Results

Similarly, the Conference's 2010 EECBG survey found that for the more than two-thirds of the respondents (151 of 221 cities) that had not previously used ESCO-type financings, more than half said that EECBG funds had prompted their city to consider or include such financing in their EECBG strategies.

Of the 204 cities participating in this new EECBG survey, slightly more than half (108 cities) provided information on how these funds helped advance innovative energy financing strategies. In addition to the five choices shown above, cities could also provide written information on other locally-initiated financing structures.

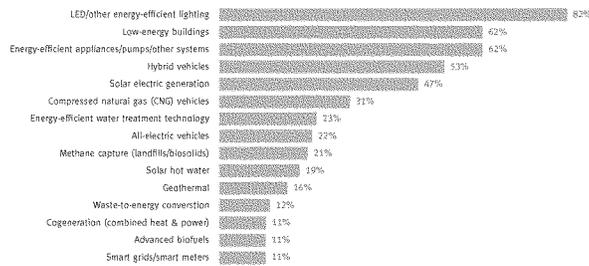
Among these responses, one city noted its loan-loss reserve program in partnership with a local credit union, allowing for no money down, no home equity-based energy loans to homeowners. Another city described its interest-free loans to help residents buy Energy Star appliances, high SEER ACs, and other energy efficient devices, reporting no loan defaults. Another one cited its multiple-city partnership in concert with its Council of Government to facilitate a regional PACE lending program.

LED/other energy-efficient lighting ranked first among energy technologies that have already been deployed by cities, with local and federal resources, most notably EECBG grants, providing the primary sources of funding for these deployments. The first table below shows the energy technologies that cities have already deployed, with more than four in five cities (82%) making LED/other energy-efficient lighting their top choice; the second table below shows the dominance of local funds and federal funds, including EECBG grants, in supporting city deployments of these energy technologies.

After lighting, more than six in ten cities have already deployed low-energy buildings (62%) and energy-efficient appliances, pumps and other systems (62%). More than half of the cities have used hybrid vehicles (53%), and almost half have installed solar technologies to generate electricity (47%). Notably, city use of all-electric vehicles increased to nearly one in four cities (23%), up considerably from the 2011 level of 13 percent.

Technologies Already Deployed by Cities

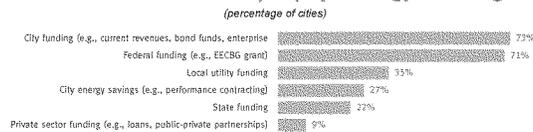
(percentage of cities)



## Survey Results

As shown in the chart below, more than seven in ten cities used city funding or federal funding as their top sources for deploying energy technologies. City funding (73%) and federal funding (71%) were used most often, with about one in three cities using local utility funding (35%) and more than one in four utilizing city energy savings (27%) to fund their energy technology deployments.

### How Cities Funded Previously-Deployed Energy Technologies



Importantly, it is generally accepted that EECBG funds did help speed the deployment of new energy technologies, especially the use of LED technologies, in cities. The findings of this report and its January 2014 companion report adds further to the anecdotal and other information that the availability of EECBG grants helped accelerate demand for LED lighting. Certainly, such an outcome remains one of the legacies of the EECBG funding commitment to cities, reminding federal policy-makers of the potency of federal investments in city-based energy efficiency and technology initiatives.

The role of the Federal government as a funding partner for cities declined sharply over the last few years. In a January 2014 report by the Conference of Mayors, *Energy Efficiency and Technologies in America's Cities*, mayors ranked utilities (71%) as their top partner in advancing new technologies, followed by state governments (49%), the private sector (41%) and the Federal government (30%). In fact, the Federal government, previously the top choice in the Conference's June 2011 energy survey, *Clean Energy Solutions for America's Cities*, fell to the fourth position among potential partners for cities. This unprecedented decline – 71 percent in 2011 to 30 percent in 2014 – is certain to have been the result of the changed federal/local partnership; the Federal government did not renew its funding commitment to the EECBG Program.

When mayors were asked to give examples of successes with the use of EECBG funds, they often cited "energy firsts" for their cities, energy savings, greater energy efficiencies, and deployment of renewable energy systems, among scores of examples. This discussion provides a sample of successes by mayors in utilizing EECBG resources in their cities.

There were many examples of successes in retrofitting public and private buildings in making the city's building stock more efficient. "Electricity use at City Hall was cut by 47 percent, an outcome helped by the availability of EECBG funds," one city wrote. "There will be a 20 percent reduction in energy use in the largest government facilities," said another. Citing other achievements, one city reported that it had retrofitted 1,267 homes and over 130 businesses with its formula grant; another said it weatherized more than 200 income-qualified homes.

## Survey Results

Some cities described how broader goals were being achieved. "Funds helped advance a non-controversial 'quick win' toward sustainable operations," said one city. "These funds helped change the mindset about energy reduction," said another. In touting its investment in renewable energy, one city wrote, "These funds helped establish the credibility of renewable energy as a reliable and affordable alternative."

Given its prominence in the survey findings, energy gains from more efficient lighting were touted often. A nearly 50 percent reduction in annual electricity costs due to LEDs was reported. Another installed over 2,000 LED streetlights with smart controls, while one said its retrofit of 2,000 city streetlights will save \$50,000 annually.

Successes with other technologies were described, with solar energy systems mentioned often. One city said EECBG funds made its first municipal solar installation possible. Another said it leveraged \$300,000 in EECBG grant funds into a \$2.5 million solar array project. Two cities indicated that 2 or more MW of solar capacity had been installed in their communities. Another city noted its solar-powered hybrid charging station in the heart of its downtown.

Other city transportation projects were traffic light signalization projects, more traditional EV charging stations, and CNG fueling stations. Cities described geothermal installations, smart grid technology, and a wind demonstration program, with one city reporting that it had used its EECBG fund to achieve a total energy savings of 37,654 MMBTU. One city reported that it had leveraged its grant into an \$8.7 million Energy Performance Contract.

The survey findings in this area follow what EECBG Program champions at The Conference of Mayors and among cities have expressed in advocating for this program. Simply, the flexibility of the block grant structure allows cities and other local governments to tailor solutions to their own communities' needs, which is especially important in the energy and climate arenas.

Finally, cities were asked to provide examples of impediments, federal and otherwise, to the most effective use of EECBG program resources. This information will be provided, upon request, to parties working to make improvements or legislative adjustments to the EECBG program in the future.



## Participating Cities

Fairbanks, AK	Pleasanton, CA	Coral Springs, FL
Fort Smith, AR	Redding, CA	Davie, FL
Little Rock, AR	Redondo Beach, CA	Deerfield Beach, FL
Avondale, AZ	Rialto, CA	Hallandale Beach, FL
Mesa, AZ	Sacramento, CA	Jacksonville, FL
Oro Valley, AZ	San Clemente, CA	Lakeland, FL
Phoenix, AZ	San Diego, CA	Largo, FL
Surprise, AZ	San Jose, CA	Lauderhill, FL
Tempe, AZ	San Leandro, CA	Miramar, FL
Tucson, AZ	Santa Ana, CA	North Lauderdale, FL
Alameda, CA	Santa Barbara, CA	North Miami, FL
Alhambra, CA	Santa Monica, CA	Orlando, FL
Anaheim, CA	Santee, CA	Palm Bay, FL
Cathedral City, CA	South San Francisco, CA	Panama City, FL
Chula Vista, CA	Tulare, CA	Pembroke Pines, FL
Costa Mesa, CA	Vallejo, CA	Pompano Beach, FL
Dublin, CA	Ventura, CA	Port St. Lucie, FL
Fontana, CA	Westminster, CA	Tallahassee, FL
Fresno, CA	Woodland, CA	West Palm Beach, FL
Gardena, CA	Aurora, CO	Athens-Clarke County, GA
Hemet, CA	Denver, CO	Atlanta, GA
Huntington Beach, CA	Westminster, CO	Columbus, GA
Irvine, CA	Bridgeport, CT	Savannah, GA
La Habra, CA	Danbury, CT	Maui, HI
Long Beach, CA	Fairfield, CT	Davenport, IA
Los Angeles, CA	Milford, CT	Des Moines, IA
Monrovia, CA	Norwich, CT	Dubuque, IA
Newark, CA	Stamford, CT	Urbandale, IA
Newport Beach, CA	Torrington, CT	Boise, ID
Novato, CA	Waterbury, CT	Idaho Falls, ID
Ontario, CA	Washington, DC	Evanston, IL
Palm Desert, CA	Wilmington, DE	Hanover Park, IL
Palmdale, CA	Boynton Beach, FL	Hoffman Estates, IL
Pasadena, CA	Cape Coral, FL	Normal, IL

## Participating Cities

Schaumburg, IL	Lincoln, NE	Charleston, SC
Carmel, IN	Nashua, NH	Summerville, SC
Indianapolis, IN	Brick Township, NJ	Sioux Falls, SD
Noblesville, IN	Elizabeth, NJ	Chattanooga, TN
Richmond, IN	Albuquerque, NM	Hendersonville, TN
Olathe, KS	Clovis, NM	Johnson City, TN
Shawnee, KS	Santa Fe, NM	Knoxville, TN
Lexington, KY	Carson City, NV	Memphis, TN
New Orleans, LA	Henderson, NV	Abilene, TX
Boston, MA	Las Vegas, NV	Corpus Christi, TX
Springfield, MA	North Las Vegas, NV	Dallas, TX
Baltimore, MD	Reno, NV	Denton, TX
Portland, ME	Albany, NY	Garland, TX
Dearborn, MI	Syracuse, NY	Mesquite, TX
Farmington Hills, MI	Cleveland, OH	Pharr, TX
Grand Rapids, MI	Columbus, OH	Plano, TX
Rochester Hills, MI	Cuyahoga Falls, OH	San Antonio, TX
Southfield, MI	Dayton, OH	Lehi City, UT
Troy, MI	Lancaster, OH	Salt Lake City, UT
Westland, MI	Lima, OH	Sandy, UT
Burnsville, MN	Tulsa, OK	South Jordan, UT
Eagan, MN	Beaverton, OR	Alexandria, VA
Minneapolis, MN	Bend, OR	Norfolk, VA
Minnetonka, MN	Gresham, OR	Burlington, VT
Columbia, MO	Hillsboro, OR	Everett, WA
Kansas City, MO	Lake Oswego, OR	Redmond, WA
St. Louis, MO	Portland, OR	Seattle, WA
University City, MO	Tigard, OR	Tacoma, WA
Burlington, NC	Lancaster, PA	Vancouver, WA
Charlotte, NC	Philadelphia, PA	Brookfield, WI
Fayetteville, NC	Pittsburgh, PA	Green Bay, WI
Greenville, NC	York, PA	Madison, WI
Winston-Salem, NC	Caguas, PR	Milwaukee, WI
Grand Forks, ND	Providence, RI	Gillette, WY

## About the Survey

This report was prepared by The U.S. Conference of Mayors and was based on data collected in a mayoral survey sponsored by Philips. From November 25, 2013 through January 14, 2014, cities could complete the survey electronically. By email, the Conference contacted nearly 1,400 mayors, most representing cities with a population of 30,000 or more, requesting mayors to complete the survey. Survey responses from 204 cities were received and analyzed for this report. We would like to thank all those who participated in the survey for their efforts and timely responses.



THE UNITED STATES CONFERENCE OF MAYORS

*Tom Cochran*

Tom Cochran, CEO and Executive Director

1620 Eye Street, NW  
Washington, DC 20006  
Tel: 202.293.7530  
Fax: 202.293.1312  
usmayors.org



128 Lakeside Avenue, Suite 401  
Burlington, VT 05401 USA  
Tel: (802) 658-6060  
Toll-free: (800) 639-6069  
veic.org

## Testimony of Scott Johnstone on S878

---

### United States Senate, Committee on Energy and Natural Resources

Chairwoman Murkowski and Ranking Member Cantwell,

Thank you for this opportunity to provide written testimony regarding Senate bill 878, a bill to establish a State residential building energy efficiency upgrades loan pilot program.

The people of our Nation hold certain common thoughts. We don't like to waste money, we appreciate it when our energy costs are lower, we want jobs to be created close to home, and we want our local economy to thrive. What is uncommon is to have a single policy that supports each of these. Energy efficiency is the policy that supports our common views; it saves money, lowers energy cost, creates jobs and enables local economy's to thrive.

To assist the people and businesses of Vermont in getting control of their energy bills the State, in 2000, created a new statewide utility - Efficiency Vermont. This new utility form is an Energy Efficiency Utility (EEU).

Over 2% of our electrical energy is now acquired each year from efficiency. Since energy efficiency improvements last years, "measure lives", this results in a total of 14% of our electricity portfolio currently available from efficiency, all at a fraction of the cost of buying it from traditional generation resources. Electric efficiency can also be deployed to alleviate constraints on the grid system and to reduce the amount of energy used at our peak load. Our investment in electric efficiency has resulted in an avoidance of our transmission and distribution infrastructure costs of more than \$300,000,000.

Best yet, efficiency is the gift that keeps on giving. An analysis, required by regulation, of how much more energy can be gained in Vermont by continued investment in efficiency is performed every three years. This 20 year forecast, demand resource plan, has consistently shown that ramping up our efforts to gain 3% of our electricity each year via energy efficiency, would result in over 30% of our electricity portfolio coming from low cost efficiency and that we will not run out of work to be accomplished over the forecast period.

As a State that relies predominately on heating fuels that are expensive and dirty, home heating oil and propane, the challenge of improving the thermal envelope of our buildings is critical to ensuring our businesses are competitive in a global economy and our residents can afford to stay warm. Over a thousand homes are weatherized each year with assistance from Efficiency Vermont and hundreds more from other great initiatives in the State.

Vermont Energy Investment Corporation is the company that holds the privilege of operating Efficiency Vermont. Our mission is to lower the economic and environmental costs of energy. We also run the Sustainable Energy Utility for the District of Columbia, Efficiency Smart which provides electrical efficiency for municipal utilities in the Mid-West to improve competitiveness in that region, and we help with policy, design and regulatory work across the United States, Canada and the globe. Among our key principles for performing energy efficiency work are the concepts of equity and market transformation.

S.878 contains a key element that will greatly assist with long term market transformation necessary to improve our buildings energy use – enabling private investment to occur by solving the financing dilemma that people across our State and Nation face today when deciding if and how to move forward with improvements.

Financing is a real challenge in the energy efficiency industry. Whole conferences of experts are assembled to try to understand why it is so hard to get the finance industry interested in this space and why residents and small businesses are so disinterested in signing up for financing.

Many financing challenges exist:

1. Efficiency improvements are invisible,
2. Some gains are taken in comfort and thus not all are there for repayment,
3. Loans are complicated with faulty assumptions of high defaults,
4. Loans have high interest rates due to the lack of secondary markets,
5. Traditional loan underwriting does not recognize any of the economic value of the energy savings and the list goes on.

That said there have been examples of success where the local market conditions and barriers are overcome. This bill's design as a pilot focusing on flexibility is central to success. Running it through the well-run and successful State Energy Program of the Department of Energy provides confidence that States will be able to make the best use of the opportunity it provides while also assuring that best practices are then shared across the country.

VEIC is equally concerned with equity. In Vermont, and across the Country, many of our residents have energy burdens as high as 35% of their income. For these people life is full of multiple jobs and too many bills. When energy costs takes up a third of all income there is simply no path out of poverty. Market transformation can help a bit – for example when CFL light bulbs are \$0.99 each we all can take advantage of this opportunity. That said the cost of truly gaining control of one's energy bill is simply not within the economic potential for low and moderate income Americans. Add to this that most low and moderate income people live in tenancy where the property owner does not allow for improvements to thermal infrastructure or appliances thus locking them into huge energy bills.

I applaud S.878 both for its potential to further positive market transformation and for its ability to help low and moderate income people become able to participate in the promise of energy efficiency through easy, low cost financing. From an equity perspective I also encourage this



committee to improve the Federal Weatherization funding and initiative and to continue to support LIHEAP to help all Americans gain greater control of their bills.

I offer one additional consideration within this bill. Historically efficiency work has been kept quite strictly in silos. Electric efficiency has been kept separate from thermal improvements for example. Today we know that we also need to lessen the use of gasoline and diesel and improve the efficiency of transportation if we are to meet our economic and environmental goals. Further, citizens are adopting distributed energy resources such as generation of renewable electricity and soon storage technology. If the purity of the silos ever helped when we were dealing just with electricity and thermal, it hinders a holistic approach to reducing Americans total energy burden.

What people want is to spend their lives outside of work pursuing those interests they care about, which typically do not include energy policy. As a result, taking steps to manage energy usage often does not receive the time or attention it deserves. Making these investment decisions as simple as possible is central to the success of this bill. The bill rightly calls for this simplicity. I encourage that the loan initiatives contemplated within this bill be able to finance all the improvements in our homes relating to energy. Appliances, lighting, insulation, air source heat pumps, electric vehicles (a mobile appliance), vehicle charging infrastructure, storage, photovoltaics, solar hot water, and so on).

Assuring the loans under S.878 may be made available within the flexibility granted DOE to cover all energy use is essential. Only when the silos come down, the interest rates are attractive, and it's as easy to get an efficiency and renewable energy loan as it is a car loan, will we get market adoption on the scale contemplated by this bill and amendment.

We agree on many things as Americans including saving money, creating good paying jobs, lowering energy costs and having thriving local economies. We even agree that climate change is real - even if we argue about its cause and that we should be taking action<sup>1</sup>. We face a time of greater than 400 ppm carbon for the first time since the seas were 60 to 90 feet higher than today. Those with the least consume a third of their income on energy. We all waste enormous funds that could be better spent improving our nation's competitiveness and improving our local economy.

S.878 can create the change necessary to see progress in each area. It can enable us all to participate in our clean, green, new energy economy. I applaud the sponsors of the Bill and urge the Committee to support it.

Thank you for this opportunity to provide comments.

Scott Johnstone  
Executive Director

---

<sup>1</sup> Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., & Rosenthal, S. (2015). *Climate change in the American mind: March, 2015*. Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication



112 STATE STREET  
MONTPELIER, VT 05620-2601

FAX: (802) 828-2342  
TEL: (802) 828-2811



Written Comments by Christopher Recchia  
Commissioner  
Vermont Public Service Department  
To  
Committee on Energy and Natural Resources  
United States Senate  
Hearing on Energy Efficiency  
April 30, 2015

The Honorable Senator Lisa Murkowski, Chairman  
The Honorable Senator Maria Cantwell, Ranking Member  
304 Dirksen Senate Office Building  
Washington, DC 20510

Dear Chairman Murkowski, Ranking Member Cantwell and members of the Committee:

Thank you very much for the opportunity to write and share how important energy efficiency is to Vermont's successful energy programs, to share a short summary of our experiences with the Committee, and to thank you for holding the April 30<sup>th</sup> hearing on this critical subject. I also want to thank you all, and in particular Senator Sanders, for the introduction of various bills designed to help advance energy efficiency accomplishments across the country.

Vermont has identified energy efficiency as our first priority energy source because it is the only energy option that saves money, improves quality of life, and has only beneficial environmental impacts.

Vermont has more than two decades of experience with utility-run electric energy efficiency programs, which are now meeting more than 13% of our state's electricity needs. We are doing this at approximately half the cost of comparable supply resources of electricity. Cumulatively, efficiency measures installed since 2000 provided 974 gigawatt-hours (GWh) of savings for Vermont by the end of 2014.

Energy efficiency also provided significant benefits to Vermonters and our entire region by way of avoided or deferred transmission and distribution investments. The combination of aggressive energy efficiency and local distributed generation in Vermont resulted in \$400 million<sup>1</sup> in projects being deferred across the region overseen by the Independent System Operator–New England (ISO-NE). These savings benefited all ratepayers, whether or not they participated in Efficiency Vermont services. Over 70% of these savings were due to aggressive energy efficiency on stressed transmission and distribution infrastructure.

Success in obtaining cost-effective energy savings continued to define efficiency as the cleanest, least expensive, and most locally acquired way to reduce Vermonters' energy costs and to meet the state's energy needs. In 2014 EVT...

- Supplied electric efficiency expected to cost approximately 4.6 cents per kilowatt-hour (kWh) over the average lifetime of the efficiency measures. (By contrast, the cost of comparable electric supply was 8.3 cents per kWh.)
- Supplied thermal energy and process fuels efficiency at 1.2 cents per MMBtu. Taking into account participating customers' additional costs and savings (The avoided cost for that fuel was 2.9 cents per MMBtu.)
- Retail partners sold more than 3,900 energy efficient appliances, 16,000 consumer electronics products, and 717,000 lighting products.

Vermont is active with EE loan and financing initiatives including technical and financial analysis, promotions, and informational support for customers. In 2014 Efficiency Vermont engaged with the following:

- Energy Loan Guarantee Program (launched in 2014): Large-project financing for businesses through Vermont banks and credit unions. Efficiency Vermont, in partnership with the Vermont Public Service Department (PSD), obtained funding to establish a loan loss reserve through a U.S. Department of Energy grant to the State Energy Program. The Vermont Economic Development Authority provided a guarantee of 75% of loans. Efficiency Vermont provided technical assistance and cash flow analysis, determining how energy savings can support loan payments.
- Heat Saver Loan (launched in 2014): Low interest rate financing for income-qualified homeowners, to be used for heating system replacements through Efficiency Vermont's EEN and in partnership with the PSD and local credit unions.

---

<sup>1</sup>ISO-NE deferred \$238 million in projects in 2011. Due to continued decline of load forecasts, ISO-NE deferred an additional \$161 million in projects in 2013.

- Business Energy Loan with Opportunities Credit Union: Increasing businesses' opportunities to finance efficiency projects by factoring energy savings into loan qualification calculations.
- Green Mountain Power (GMP) EverGreen Fund: Zero-interest on-bill financing for K–12 schools and municipal buildings located in GMP service territory.
- Municipal Tax-Exempt Leasing: Opportunities for municipalities to make energy-saving upgrades in facilities such as K–12 schools without raising budgets or establishing bonds.
- Property Assessed Clean Energy (PACE): Home loans secured by a property lien. In 2014, improvements included a 50% loan advance prior to project completion, lowered fees, clarification that there is no early payoff penalty, and an interest rate buy-down funded through the PSD.
- Green Revolving Fund: Financing for colleges, universities, and other nonprofit institutions, with financial support from the High Meadows Fund and in partnership with the Sustainable Endowments Institute.
- Agricultural Energy Efficiency Loan: Providing agricultural facilities with access to financing for energy efficiency projects.

Vermont homeowners and renters benefit from efficiency across other areas as well, saving on heating fuels and reducing our dependency on heating oil. In 1976, Vermont established a low-income weatherization program, funded by the U.S. Department of Energy, and a state-level Weatherization Trust Fund in 1990 to supplement the Federal funds. Today, the program is primarily funded by state funds. Vermont also directs its revenues from the Regional Greenhouse Gas Initiative and from energy efficiency participation in the regional electric capacity markets to fund efficiency programs targeting unregulated fuels, such as oil and propane, and Vermont Gas Systems (our natural gas utility) delivers efficiency services to its customers as well. Together, these programs add hundreds of millions of dollars to our state's economy by helping Vermonters spend less on energy and more on other goods, while supporting thousands of jobs in the construction and energy service industries.

Weatherization, in particular, is extremely cost-effective in our part of the country and has a quick payback to homeowners. Still, we are only reaching a fraction of the homes that can benefit from insulation and air sealing. A recent study of residential energy efficiency programs (the Home Performance with Energy Star program) commissioned by my Department suggests that the two top barriers for customers failing to complete recommended energy efficiency upgrades are (1) project cost and (2) financing issues.

Among other things, the study recommends building and maintaining a suite of tools to help overcome barriers to customer participation, including financing. Vermont is continuously innovating to expand our suite of tools to make energy efficiency possible and attractive

for residents. We are increasingly looking to financing and loan options, which enable a fixed amount of public investment to go further by leveraging private sector capital as well. The bills you and other members have introduced can go a long way toward helping us overcome these barriers.

Recently, as noted above, my department established the Heat Saver Loan program in partnership with the Efficiency Excellence Network (EEN). The EEN is a partnership between fuel dealers, building performance contractors, and one of our energy efficiency utilities, Efficiency Vermont. The Heat Saver Loan program was launched late last year to provide loans for the installation of high efficiency boilers and furnaces, weatherization, cold-climate heat pumps, solar hot water, biomass heat, and other clean heating technologies. The loans offer attractive financing for homeowners looking to overcome up-front expenses to upgrade energy equipment and save money. Current interest rates range from 0% to 4.99%, based on an applicant's household income and loan terms. Heat Saver Loans can range up to a maximum of \$35,000 for eligible installations.

While the Heat Saver Loan program is in its early days, we believe the program may serve a critical and specific need in our state. Each state would benefit from flexible and state-specific opportunities to devise financing tools that address its needs. The proposed Residential Energy Savings Act would enable our state and others to access low cost financing, and pass those low rates through to homeowners and tenants seeking to make cost-effective energy efficiency investments. Of particular importance to residents is the ability to offer loan terms that are comparable to the lifetime of the energy efficiency measures paid for with the loans. This should allow energy efficiency projects, such as home weatherization, funded by such a loan to be cash-flow positive, in which the savings each year more than pay for the cost of the loan. We believe that achieving positive cash flow is a critical step to encourage more homeowners to invest in energy efficiency.

In 2009, Vermont began to use the IECC standards for its Residential Building and Energy Standards (RBES). Only Vermont and Maryland currently meet or exceed the IECC 2015 standard, while eleven other states meet or exceed the IECC 2012. Twenty seven states meet or exceed the IECC 2009, and sixteen states have an energy code less stringent than the IECC 2009 or have no energy code at all.

The proposed Residential Energy Savings Act (S.878) introduced by Senators Sanders, Cantwell, Wyden, King, Whitehouse, Markey, and Franken, and last year, Senator Murkowski, in particular would be very helpful to states in moving residential thermal energy efficiency to the forefront. It would likely help states support enhancing

their efforts to have RBES that reflect more recent IECC levels. This innovative bill would provide loans from the Federal government to the states which would, in turn, set up voluntary programs to loan money to residential consumers for energy efficiency upgrades. It will complement nicely the Weatherization Assistance Program, going beyond low-income households to offer financing to all residential consumers. The bill also encourages innovative loan repayment strategies such as on-bill repayment tied to the utility meter. On-bill repayment should enable tenants, working with their landlords, to invest in energy efficiency, knowing that they can share the cost and benefits of efficiency with future tenants.

Vermont renters are typically of low- to middle-income, and don't have ready access to capital – on-bill loan options could allow them to benefit from energy efficiency. While Vermont does not yet have extensive on-bill repayment programs for the residential sector, we are actively investigating and piloting them, and loans under the provisions of this Act could provide the capital we need to scale these options.

So, in closing, I urge your support for the various bills pending before your committee to add new tools to the states so that we can take full advantage of improving people's lives, saving money and energy, and enhancing the economic position of all our citizens.

Thank you for your work in this important area.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Christopher Recchia". The signature is fluid and cursive, written in a professional style.

Christopher Recchia  
Commissioner