AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

NEGAWATTS: THE ROLE OF EFFICIENCY POLICIES IN CLIMATE LEGISLATION

HEARING

BEFORE THE

SELECT COMMITTEE ON
ENERGY INDEPENDENCE
AND GLOBAL WARMING
HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

SECOND SESSION

MAY 8, 2008

Serial No. 110–36

Printed for the use of the Select Committee on
Energy Independence and Global Warming

globalwarming.house.gov

U.S. GOVERNMENT PRINTING OFFICE

61–726 WASHINGTON : 2010

For sale by the Superintendent of Documents, U.S. Government Printing 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

SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING

EDWARD J. MARKEY, Massachusetts, *Chairman*

EARL BLUMENAUER, Oregon
JAY INSLEE, Washington
JOHN B. LARSON, Connecticut
HILDA L. SOLIS, California
STEPHANIE HERSETH SANDLIN, South Dakota
EMANUEL CLEAVER, Missouri
JOHN J. HALL, New York
JERRY MCNERNEY, California

F. JAMES SENSENBRENNER, JR., Wisconsin
Ranking Member
JOHN B. SHADEGG, Arizona
GREG WALDEN, Oregon
CANDICE S. MILLER, Michigan
JOHN SULLIVAN, Oklahoma
MARSHA BLACKBURN, Tennessee

PROFESSIONAL STAFF

GERALD J. WALDRON, *Staff Director*
ALIYA BRODSKY, *Chief Clerk*
THOMAS WEIMER, *Minority Staff Director*

CONTENTS

	Page
Hon. Edward J. Markey, a Representative in Congress from the Commonwealth of Massachusetts, opening statement	1
Prepared Statement	3
Hon. F. James Sensenbrenner, Jr., a Representative in Congress from the State of Wisconsin, opening statement	5
Hon. John Hall, a Representative in Congress from the State of New York, opening statement	6
Hon. Emanuel Cleaver II, a Representative in Congress from the State of Missouri, Prepared Statement	7
WITNESSES	
Hon. Paul A. DeCotis, Deputy Secretary of Energy, New York State	8
Prepared Statement	10
Answers to Submitted Questions	75
Hon. Dian Grueneich, Commissioner, California Public Utilities Commission	16
Prepared Statement	18
Mr. George Sakellaris, President and CEO, Ameresco, Inc.	23
Prepared Statement	25
Mr. Steven Kline, Vice President, Environment and Federal Affairs, Pacific Gas and Electric Corporation	33
Prepared Statement	35
Answers to Submitted Question	82
Mr. Robert Cowart, Director, Regulatory Assistance Project	43
Prepared Statement	45
SUBMITTED MATERIALS	
Hon. Edward J. Markey letter of October 10, 2008 from Mr. Steven Kline	88
U.S. Climate Action Partnership Energy Efficiency & Buildings Legislative Recommendations, June 8, 2007	89

NEGAWATTS: THE ROLE OF EFFICIENCY POLICIES IN CLIMATE LEGISLATION

THURSDAY, MAY 8, 2008

HOUSE OF REPRESENTATIVES,
SELECT COMMITTEE ON ENERGY INDEPENDENCE
AND GLOBAL WARMING,
Washington, DC.

The committee met, pursuant to call, at 10:10 a.m. in room 210, Cannon House Office Building, Hon. Edward J. Markey (chairman of the committee) presiding.

Present: Representatives Markey, Hall and McNerney.

Staff Present: Joel Beauvais, Jonathan Phillips.

The CHAIRMAN. Good morning, ladies and gentlemen. Welcome to the Select Committee on Energy Independence and Global Warming and our very important hearing today.

When we look into the energy and climate solutions toolbox, we usually focus on exciting new technologies like high-powered wind turbines, thin-film solar cells, or carbon capture and sequestration. Today's hearing, however, is about the less eye-catching, but equally important solutions that improve energy efficiency, demand-side management, better building and appliance standards, lighting retrofits, and the host of other technologies and policies that enable us to use electricity more intelligently.

The Department of Energy projects that U.S. electricity demand will grow by 30 percent by 2030. There are two ways to meet this rising demand, megawatts and negawatts. The first approach is the one we are familiar with, simply building more and more power plants. The second uses efficiency measures to do more with less. It is based on the reality that the cheapest and the cleanest power plant is the one that we never have to build.

A recent study by McKinsey & Company concluded that in 2030, efficiency measures can cut U.S. global warming pollution by nearly 15 percent of current levels at a profit. The 10 Northeastern States participating in the RGGI cap, auction, and trade system have found that by auctioning 100 percent of the pollution allowances and investing the proceeds in efficiency measures, they can achieve their climate goals at virtually no additional cost to consumers.

Cap, auction and trade provides the resources to make efficiency policies work, while efficiency cuts pollution at the lowest possible cost. These solutions help us to work smarter and not harder. Investing in efficiency is not just a cost-effective energy and climate solution, it will also pay major dividends in new jobs and economic growth.

America's efficiency industry already produces close to a trillion dollars in annual revenues. One recent study found that aggressive investment in efficiency policies could result in the creation of 32 million new jobs and nearly $4 trillion in revenue by 2030.

By putting America in the vanguard of an efficiency revolution, we can create high-quality, green jobs at home while exporting high-quality, green technology in the world. Unfortunately increasing America's energy efficiency is not as straightforward as it may seem. As we will hear from our witnesses, many efficiency improvements can already be achieved today at a profit, but are not being implemented because of market barriers. For this reason, simply putting a price on carbon is not enough. Focused policies must be used to reward efficiency and to eliminate perverse incentives like those that couple utilities' profits with the amount of electricity which they sell.

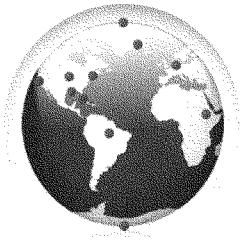
Progressive States like California and New York, along with the innovative companies like PG&E and Ameresco, and organizations like the Regulatory Assistance Project have taken the lead in tackling these challenges. We are grateful to have representatives of these government, business and nonprofit leaders on our witness panel today. They can help show us the way forward.

As Congress considers cap, auction and trade legislation to combat global warming, it will be critical to include policies that support efficiency. We have already taken an important step by enacting new vehicle and appliance efficiency standards under the Energy Independence and Security Act, but there is more that we can do, and we must do if we are to cut global warming pollution as quickly and as deeply as the science says we must. It is imperative that climate legislation be designed to capture efficiency gains immediately. By making the potential of energy efficiency a reality, we can save the planet while simultaneously saving consumers money, and spurring job growth, and meeting our Nation's rising energy demands at the lowest possible cost.

NBA coach Pat Riley once said a particular shot, a way of moving the ball, can be a player's personal signature, but efficiency of performance is what wins the game for the team. If we are going to beat this energy, climate and economic challenge, aggressively increasing America's energy efficiency must be at the center of our game plan.

So with that, the opening statement of the Chair is concluded, and I recognize the gentleman from Wisconsin, the Ranking Member of the committee, Mr. Sensenbrenner.

[The prepared statement of Mr. Markey follows:]



THE SELECT COMMITTEE ON
ENERGY INDEPENDENCE AND GLOBAL WARMING

"Negawatts: The Role of Efficiency Policies in Climate Legislation"
Opening Statement of Chairman Edward J. Markey
Select Committee on Energy Independence and Global Warming
April 8, 2008

When we look into the energy and climate solutions toolbox, we usually focus on exciting new technologies like high-powered wind turbines, thin-film solar cells, or carbon capture and sequestration. Today's hearing, however, is about the less eye-catching but equally important solutions that improve energy efficiency: demand-side management, better building and appliance standards, lighting retrofits, and the host of other technologies and policies that enable us to use electricity more intelligently.

The Department of Energy projects that U.S. electricity demand will grow by 30 percent by 2030. There are two ways to meet this rising demand—megawatts and "*nega*watts." The first approach is the one we are familiar with—simply building more power plants. The second uses efficiency measures to do more with less. It is based on the reality that the cheapest and the cleanest power plant is the one we never have to build.

A recent study by McKinsey & Company concluded that in 2030, efficiency measures can cut U.S. global warming pollution by nearly 15 percent of current levels, at a profit. The 10 northeastern States participating in the "RGGI" cap-auction-and trade system have found that by auctioning 100 percent of the pollution allowances and investing the proceeds in efficiency measures, they can achieve their climate goals at virtually no additional cost to consumers. Cap-auction-and-trade provides the resources to make efficiency policies work, while efficiency cuts pollution at the lowest possible cost. These solutions help us to work smarter, not harder.

Investing in efficiency is not just a cost-effective energy and climate solution. It will also pay major dividends in new jobs and economic growth. America's efficiency industry already produces close to a trillion dollars in annual revenues. One recent study found that aggressive investment in efficiency policies could result in the creation of 32 million new jobs and nearly $4 trillion in revenues by 2030. By putting America in the vanguard of the efficiency revolution, we can create high-quality green jobs at home, while exporting high-quality green technology to the world.

Unfortunately, increasing America's energy efficiency is not as straightforward as it may seem. As we will hear from our witnesses, many efficiency improvements can already be achieved today at a profit, but are not being implemented because of market barriers. For this reason, simply putting a price on carbon is not enough. Focused policies must be used to reward efficiency and to eliminate perverse incentives, like those that couple utilities' profits with the amount of electricity they sell. Progressive states like California and New York, along with innovative companies like PG&E and Ameresco and organizations like the Regulatory Assistance Project, have taken the lead in tackling these challenges. We are grateful to have representatives of these government, business, and nonprofit leaders on our witness panel today. They can help show us the way forward.

As Congress considers cap-auction-and-trade legislation to combat global warming, it will be critical to include policies that support efficiency. We have already taken an important step by enacting new vehicle and appliance efficiency standards under the Energy Independence and Security Act, but there is much more we can and must do. If we are to cut global warming pollution as quickly and as deeply as the science says we must, it is imperative that climate legislation be designed to capture efficiency gains immediately. By making the potential of energy efficiency a reality, we can save the planet while simultaneously saving consumers money, spurring job growth, and meeting our nation's rising energy demand at the lowest possible cost.

NBA coach Pat Riley once said, "A particular shot or way of moving the ball can be a player's personal signature, but efficiency of performance is what wins the game for the team." If we are going to beat this energy, climate, and economic challenge, aggressively increasing America's energy efficiency must be at the center of our game plan.

Mr. SENSENBRENNER. Thank you very much, Mr. Chairman. At the outset let me say that we are due for a string of five votes, and I have another meeting that will be about 11:30, so I kind of apologize for not coming back when the hearing resumes, but we have no control over what goes on across the street.

Improving energy efficiency is one of the most important steps that can be taken to confront climate change, and I am pleased that the Chairman has scheduled this meeting. As we all know, reducing CO_2 emissions while protecting the health of the economy is a formidable challenge. Some may think this goal is not achievable, but I think that through significant advances in technology, we can make significant reductions in greenhouse gases while still growing the economy.

Some of this technology is not yet available. The good example of this is carbon capture and sequestration, which is still on the drawing board, but has the potential to make tremendous reductions in greenhouse gas emissions in the future. And some advances are needed in renewable technologies to make them more cost-competitive.

Another potent technology is nuclear power, which is ready now and can generate power without any greenhouse gas emissions whatsoever. Both of these technologies have the potential to reduce emissions in the long term; however, it is energy efficiency that gives us the best chance to produce emissions reductions in the short term.

Studies shows that even simple improvements in energy efficiency standards create significant reductions in greenhouse gas emissions. Not only that, but increased energy efficiency also stands to create significant reductions in the power bill.

Whether you are a big industry, a small business, a homeowner or even a renter, improvements in efficiency will help the bottom line. The cost of power is rising, and because of this there is clearly free-market pressure to adopt energy efficiency. In fact, the rising cost of power is without doubt the best possible argument for improving energy efficiency.

I also believe that in some cases government can encourage efficiency through support of research and development and through certain tax credits. Industry standard setting is also useful.

I do not support the government artificially imposing improved efficiency through mandates, regulations and rules. If the government tries to mandate or regulate efficiency, to most it will become a tax, and that will hold down economic growth. In fact, one study that forecasts enormous reductions in emissions also comes with an enormous price tag that raises questions as to whether reductions are even worth it.

While I am glad the select committee is talking about energy efficiency, it seems that most of the testimony we expect to hear today will be nothing more than a call for more regulation. That is a mistake. We all may agree that improved efficiency holds tremendous promise, and there appears to be great differences in our beliefs and how to get there. I think that the pressure of energy prices will lead people to adopt energy efficiency on their own accord, which would result in cheaper energy prices. And cheaper energy is something all of us can support. Thank you.

The CHAIRMAN. The Chair now recognizes the gentleman from New York State Mr. Hall.

Mr. HALL. Thank you, Mr. Chairman and Ranking Member Sensenbrenner. Good morning and welcome to our witness.

I find it appropriate that as we enter the summer driving and home-cooling season, we are here today to discuss the positive impacts that energy efficiency can have on our economy and our environment.

There is rightly much attention being paid right now to gas prices, but home electricity costs eat into family budgets, too. As the temperature rises, so does the power bill for families trying to keep their homes at a reasonable temperature. The Energy Star program has labeled appliances and empowered consumers to take the edge off their power demand.

Earlier this year the Congress passed groundbreaking legislation to further this effort; however, the macro benefits of sweeping energy efficiency measures require that we go further. Quite simply, widespread efficiency in every sector of the economy is the fastest, simplest and most immediately achievable way to reduce demand, save money and cut greenhouse gas emissions. And more than that, I would say that energy savings by efficiency are the only truly impact-free form of generating or recovering a kilowatt or a calorie of energy, whatever unit you choose.

By simply being smarter about the appliances we use, the materials we use in construction, and making slight adjustments to our patterns of use, we can make an impact which has a ripple effect that is orders of magnitude larger than the individual actions we take to conserve energy without forcing major changes to our way of life. By taking one action and implementing aggressive streamlining measures, we can forego billions of tons of greenhouse gas emissions, generate billions of dollars in economic opportunity, and create a stimulating effect that will lead to job growth and economic resurrection. That is truly efficient indeed.

I am proud that my State of New York, a leader on this issue, is represented by Deputy Secretary DeCotis, and I look forward to his testimony as well as the rest of the panel's views.

I yield back.

The CHAIRMAN. The gentleman's time has expired.

There are going to be a series of roll calls on the floor of the House. The bells announcing that can be heard in the background as I make that statement. We probably have the time to hear the opening statements of two of our witnesses, so I would recommend that we proceed in that fashion. Then we will recess and come back and hear from the rest of our witnesses and questions from the panel.

[The prepared statement of Mr. Cleaver follows:]

U.S. Representative Emanuel Cleaver, II
5th District, Missouri
Statement for the Record
House Select Committee on Energy Independence and Global Warming Hearing
"Negawatts: The Role of Efficiency Policies in Climate Legislation"
Thursday, May 8, 2008

Chairman Markey, Ranking Member Sensenbrenner, other Members of the Select Committee, good morning. I would like to welcome our distinguished panel of witnesses to the hearing today.

Energy efficiency is a common sense practice, as it seeks to make vehicles, homes, and businesses less wasteful and to have a diminished impact on the environment. Making our buildings and cars more efficient to utilize less energy takes a small investment that has a great benefit. Our own place of business, the Capitol building, is in the process of being retrofitted with new energy efficient lighting as part of a comprehensive "Greening the Capitol" initiative.

By using "negawatts" of power, efficiency is increased instead of generation capacity, and the process is considered the cleanest method to meet our increasing energy demand. It is estimated that efficiency measures can increase available resources at about three cents per kilowatt-hour, in contrast to close to seven cents per kilowatt-hour for conventional coal-fired generation. Congress needs to actively encourage energy efficiency in buildings, vehicles, and appliances, while also pursuing renewable and domestic energy. Our country needs to form effective energy policy to achieve these goals, and I hope that our guests today can help the committee in forming a solution.

I thank all of our witnesses for their insight and suggestions, and I appreciate them taking the time to visit with our committee this morning.

Thank you.

The CHAIRMAN. So we will begin with our first witness, Mr. Paul DeCotis. He is the Deputy Secretary of Energy for the State of New York, where he heads up the State's efforts to advance renewable energy and energy efficiency programs. We welcome you, sir.

STATEMENT OF PAUL A. DECOTIS, DEPUTY SECRETARY OF ENERGY, STATE OF NEW YORK

Mr. DECOTIS. Thank you. Good morning, Chairman Markey, Ranking Member Sensenbrenner and members of the committee. On behalf of Governor Paterson, I welcome the opportunity to present this testimony to this Select Committee on Energy Independence and Global Warming and look forward to working with the committee to ensure development of leading and effective climate policy.

It is now widely accepted that energy efficiency is one of the lowest-cost options available for reducing greenhouse gas emissions. Many States throughout the country now have had almost 30 years of experience administering energy efficiency programs, all with similar results, providing conclusive evidence of the low cost of energy efficiency relative to new power generation, and of the economic and environmental benefits associated with reducing electricity use through energy efficiency improvements.

So the question is not should we be supporting and investing in energy efficiency, it is instead to determine how we can do this most effectively with rapid penetration of existing commercially available technologies in the near term, and steady and continued development of better, more adaptable and cheaper technologies over the longer term. We need both an energy efficiency and a carbon reduction policy.

A portfolio of low-carbon options on the demand side and the supply side will most definitely be necessary, as well as policies that address sectors beyond electricity.

New York has a longstanding history of supporting energy efficiency that dates back nearly four decades. New York's energy efficiency efforts began in the late 1970s with Federal funding provided to the States through the Energy Policy and Conservation Act of 1975 and the State Energy Conservation Program administered by the U.S. Department of Energy.

While the funding was small relative to need, New York was able to develop a diverse portfolio of programs serving residential business and governmental customers. New York's energy efficiency programs directed at the electric utility sector began in earnest in 1984. At the time demand-side management programs were viewed by the State's public service commission as potential alternatives to continued investment in new central station power generation.

By the late 1980s, utilities in New York were reporting significant peak demand and electric energy reductions. By 1993, DSM spending by investor-owned utilities reached $280 million, which is equivalent to about $400 million today, a dramatic increase from the $25 million spent in 1984. Additional demand-side management spending by the State's energy authorities raised the State's annual investment in energy efficiency in 1993 to about $330 million, which is about $470 million in today's dollars.

With the transition to wholesale electric market competition in 1996, the responsibilities for administering energy efficiency programs in New York was transferred to the New York State Energy Research and Development Authority, or NYSERDA, and NYSERDA has been administering efficiency programs along with research and development programs in cooperation with the New York Power Authority and Long Island Power Authority since 1998.

Under the System Benefits Charge program, the level of annual energy bill savings has grown to almost half a billion dollars annually. The program is saving approximately 3,100 gigawatt hours of electricity, and the level of annual greenhouse gas reduction is equivalent to removing 400,000 cars from New York's roadways. That is about 2 million tons annually. For every $1 invested in efficiency in New York, the program saved $2 and avoided energy costs.

Last year New York embarked on its 15 by 15 Initiative, the goal of which is to reduce statewide electricity use by 15 percent from forecast levels for the year 2015. 15 by 15 represents a dramatic acceleration of New York's energy efficiency commitment and results in more than offsetting annual electricity load growth in the State.

In 2009, the State's energy authorities alone have budgeted close to half a billion dollars for energy efficiency. The investor-owned utilities and new funding from the 15 by 15 Initiative could easily add an additional 400 million, bringing the total annual funding close to a billion dollars.

New York's energy efficiency policies have been framed, justified and developed with full recognition that energy efficiency is one of the lowest——

The CHAIRMAN. If you could summarize, please.

Mr. DECOTIS. Sure.

Regarding the cap-and-trade programs, which is one of the questions that was asked, New York is actively participating in leading in the Regional Greenhouse Gas Initiative. The proceeds from the sale of the auctions will be used for low-cost carbon abatement technologies, including energy efficiency, but it will also extend to other sectors of the economy, including transportation efficiencies, carbon capture and sequestration technologies, et cetera. So the funding will not be limited to simply electric energy efficiency.

The CHAIRMAN. Thank you, sir.

[The statement of Mr. DeCotis follows:]

Testimony of

Paul A. DeCotis
Deputy Secretary for Energy
New York State
Albany, NY

Before the
United States House of Representatives
Select Committee on Energy Independence and Global Warming

Regarding

"Negawatts: The Role of Efficiency Policies in Climate Legislation"

May 8, 2008

Good morning Chairman Markey, Ranking Member Sensenbrenner and members of the Committee. I am Paul A. DeCotis, Deputy Secretary for Energy in the Administration of Governor David A. Paterson. On behalf of Governor Paterson, I welcome the opportunity to present this testimony to the Select Committee on Energy Independence and Global Warming, and look forward to working with the Committee to ensure development of leading and effective climate change policy.

It is now widely accepted that energy efficiency is one of the lowest cost options available for reducing greenhouse gas emissions. This has been underscored in the recent Intergovernmental Panel on Climate Change report and a number of studies of greenhouse gas abatement options, including the December 2007 McKinsey report. Many states throughout the country now have had almost thirty years of experience administering energy efficiency programs – all with similar results – providing conclusive evidence of the low cost of energy efficiency relative to new power generation, and of the economic and environmental benefits associated with reducing electricity use through energy efficiency improvements. So the question is not should we be supporting and investing in energy efficiency; it is instead to determine how we can do this most effectively – with rapid penetration of existing commercially available technologies in the near-term and steady and continued development of better, more adaptable, and cheaper technologies over the longer-term.

We must also keep in mind that many in the science community are calling for an 80% reduction of greenhouse gas emissions by 2050 and that even the most aggressive energy efficiency programs will not, by themselves, get us to this endpoint in the U.S. – and certainly not globally. We need both an energy efficiency and a carbon reduction policy. A portfolio of low-carbon options on the demand side and the supply side will most definitely be necessary, as well policies that address sectors beyond electricity.

New York State's Actions to Address Global Climate Change

New York has a long-standing history of supporting energy efficiency that dates back nearly four decades. As a leader in energy efficiency, many states adopted New York prototype programs years ago.

New York is very dependent on fossil fuels to heat its homes and power its businesses. Oil use in buildings and industry in New York averaged 3.2 billion gallons annually over the last three years, more than any other state in the nation. As fossil fuel prices increase worldwide, so does the price of energy commodities, including heating oil, gasoline, and electricity. This situation is further exacerbated by the fact that the State does not have significant indigenous fossil fuel resources. This fact, coupled with concerns over climate change, makes energy efficiency an essential component of New York's economic and energy policies. Investing in energy efficiency also helps to stem the flow of energy dollars out of the state, creating economic opportunities within the State and improving its environment.

Through the years, New York has implemented several different policies to realize the benefits of using electricity with optimum efficiency, putting in place a series of programs, variously termed energy conservation, energy efficiency, or demand side management.

New York's energy efficiency efforts began in the late 1970s with federal funding provided to the states through the Energy Policy and Conservation Act of 1975 and the State Energy Conservation Program (SECP), administered by U.S. DOE. These programs primarily targeted federal buildings, major industries, and institutions such as schools and hospitals. While the funding was small relative to need, New York was able to develop a diverse portfolio of programs serving the residential, business, and government sectors. These programs took another step forward in the 1980s as result of receiving significant funding from a legal settlement against Exxon and other oil companies for charging excessive prices for their crude oil in the late 1970s. By 1989, New York State received over $335 million, including interest, from this funding source.

New York's energy efficiency efforts directed at the electric utility sector began in earnest in 1984, largely driven by concerns about the construction delays and escalating costs that were plaguing new plant construction. At the time, demand-side management (DSM) programs were viewed by New York's Public Service Commission (PSC) as potential alternatives to continued investment in new central station power generation projects. As a result, investor-owned utilities were required by the PSC to develop pilot-scale DSM programs that included energy efficiency and load management. The programs were initially funded at approximately $25 million annually, representing approximately one-quarter of one percent of gross annual utility revenue.

Following an assessment of the pilot programs in 1987, the PSC concluded that DSM programs were a viable and economic alternative to new energy supply resources and that DSM should be considered on equal footing with supply resources in integrated resource planning. At a minimum, it was recognized that DSM could delay the need for peaking capacity, even if the need for new base load power supplies could not be totally eliminated. The job creation and environmental benefits associated with reducing electricity use were also identified and

quantified as further justification for investment in DSM. Utilities were directed to assess DSM potential, identify cost-effective programs, establish DSM goals, and develop long-range DSM plans, including incentive and information and education programs.

By the late 1980s, utilities in New York were reporting significant peak demand and electric energy reductions. By 1993, DSM spending by investor-owned utilities reached $280 million (equivalent to about $400 million in 2007 dollars) a dramatic increase from the initial $25 million spent in 1984. Additional DSM spending by the State's energy authorities raised the State's annual investment in energy efficiency resources in 1993 to about $330 million (about $470 million in 2007 dollars).

In 1996, New York began the process of restructuring its electricity industry. A key element of this effort was that investor-owned utilities were required to sell generation assets to independent power producers. As a result, New York's traditional vertically integrated utilities were transformed into transmission and distribution companies. With the transition to wholesale market competition, the responsibilities for administering energy efficiency and load management programs were transferred from utilities to the New York State Energy Research and Development Authority (NYSERDA). The utilities' role, following divestiture of their generation assets, is to collect program funds from ratepayers through a System Benefits Charge (SBC).

The funds are provided to NYSERDA, under the oversight of the Public Service Commission, to administer energy efficiency, load management, environmental protection, and research and development programs. NYSERDA has been administering statewide SBC programs in cooperation with the New York Power Authority (NYPA) and the Long Island Power Authority (LIPA) since 1998.

Under the System Benefits Charge-funded **New York Energy $mart**[sm] program alone – one of several programs – the level of annual energy bill savings has grown to $480 million. The program is saving approximately 3,100 GWh of electricity annually. The level of annual greenhouse gas reduction has grown to nearly 2 million tons, which is equivalent to removing approximately 400,000 cars from New York roadways. And for every dollar New Yorkers invest through this program, $2 in energy costs are avoided.

Last year, New York embarked on its 15 by 15initiative. The goal of the initiative is to reduce statewide electricity use by 15 percent from forecasted levels for the year 2015 primarily through the use of new energy efficiency. The initiative would also curb greenhouse gas emissions produced from electricity generation. 15 by 15 represents a dramatic acceleration of New York's energy efficiency commitment. In 2009, the State's energy authorities alone have budgeted close to $500 million for energy efficiency. The investor-owned utilities, and new funding from the 15 by 15 initiative could easily add an additional $400 million, bringing total annual funding close to $1 billion.

Energy Efficiency Portfolio Standard Proceeding (15 X 15)

New York's Public Service Commission instituted the Energy Efficiency Portfolio Standard proceeding in May 2007 in recognition of the need to respond to the State's energy needs with economic efficiency and increased awareness of the environmental and climate costs of burning fossil fuels for energy, and of the price of dependence upon imported energy sources.

In the proceeding, the Public Service Commission affirmed that realizing the State's energy efficiency potential and reducing New York's electricity usage 15 percent from expected levels by 2015 are in the public interest. Having now embarked on a policy to achieve that goal, we expect that New York's energy efficiency programs will become among the most aggressive in the Nation. The issues that are being addressed in the Energy Efficiency Portfolio Standard proceeding include:

- Cost-effective approaches to achieving long-term efficiency to be administered by utilities, state agencies and authorities, third party administrators and market participants;
- Consistent statewide outreach and education efforts on efficiency programs and measures;
- Examining enhanced energy building codes and appliance standards;
- Providing programs for all customer sectors including low-income, other residential and business customers of all types; and
- Enhancing and improving the energy efficiency workforce to deliver services in all parts of the state.

From a broader, long-term perspective, we must realize that our efforts toward the 15 by 15 initiative should not be a sprint that ends in 2015, but rather the first leg of a marathon moving us toward the levels of emission reductions that we will need by 2050.

The state has also taken on a lead by example approach. Through Executive Order 111 and the state's Clean Energy Collaborative, state agencies and authorities are implementing efficiency and other low-carbon emissions measures within state government.

Governor Paterson's Renewable Energy Task Force[1] recognized energy efficiency as the first renewable energy fuel. As such, among its recently issued recommendations for increasing New York's renewable energy resources, the task force called for further efficiency measures.

All of these recent energy efficiency policies in New York State have been framed, justified and developed with full recognition that energy efficiency is one of the lowest cost options to reducing greenhouse gas emissions. More specifically, non-electric energy efficiency measures are even included as "carbon offsets" in the proposed Regional Greenhouse Gas Initiative (RGGI) regulations.

[1] The first report of the Renewable Energy Task Force, "Clean, Secure Energy and Economic Growth: A Commitment to Renewable Energy and Enhanced Energy Independence" is available at http://www.state.ny.us/governor/press/lt_RETF_Report.pdf.

Relationship between Energy Efficiency Policies and a Cap-and-Trade Program

Energy efficiency policies are not a substitute for cap-and-trade programs to control greenhouse gas emissions. That is why New York is pursuing *both* a cap-and-trade policy through the Regional Greenhouse Gas Initiative (RGGI) and aggressive energy efficiency policies. To attempt to address the needed level of greenhouse gas reduction, we will need the full force of both a market price signal for carbon dioxide reduction, which comes with a cap and trade program, as well as policies and incentives for energy efficiency to overcome market barriers. Energy efficiency initiatives are the perfect complement to carbon cap and trade programs, as they reduce the cost of complying with the cap.

Furthermore, we need to realize that in order to address climate change in the United States, and globally, in a politically, socially, and economically acceptable manner, we will need to mobilize the *full capacity for innovation* in the country: innovation in policy, innovation in technology, and innovation in finance. There is no silver bullet. While stabilization of greenhouse gas emissions could be within our grasp with existing technology, new science and new engineering will be needed to reduce costs and address the tremendous challenges associated with the transformation of our energy system that is being called for by climate change experts. In fact, this was a resounding theme at the recent National Academy of Sciences Summit on "America's Energy Future." As a member of the Board on Energy and Environmental Systems of the National Academies, and a member of the energy efficiency panel supporting the America's Energy Futures study, I know there is a preponderance of evidence to conclusively support the role of innovation, technology, and energy efficiency in reducing energy use, supporting economic development, and improving our environment.

New York's Use of Proceeds of Allowance Auctions under the Regional Greenhouse Gas Initiative

New York will not invest all of the proceeds of the RGGI allowance auctions in efficiency measures. Rather, New York's proposed regulations state that RGGI proceeds will be used to "promote and implement programs for energy efficiency, renewables, and innovative carbon emission abatement technologies with significant carbon reduction potential." While we expect investments in energy efficiency technologies and measures will play very prominently into the RGGI programs, other technologies and options such as renewable energy and carbon abatement technologies will also be considered.

With regard to efficiency investments, a portion of RGGI proceeds would allow for an all-fuels approach. While the System Benefits Charge is very effective at targeting electric savings, the need for "energy efficiency" must extend beyond the electric and natural gas utility sector. Current programming based on ratepayer received dollars is appropriately targeted to electric and natural gas efficiency. However, that has created gaps in worthwhile program activities such as oil efficiency – which is critical in New York given the high percentage of homes using heating oil – and transportation fuel efficiency. RGGI proceeds could potentially help us address these other fuel sectors, which would further reduce greenhouse gas emissions.

Efficiency Measures and Cost Savings to Consumers

Program planning for use of these proceeds will commence upon finalization of the RGGI regulations; which will happen within months. We will evaluate the full range of energy efficiency options, *looking at all fuels and all sectors.* We are currently doing a study to estimate the costs of different greenhouse gas emission reduction options in New York State, and will use this study to help guide our future investment decisions. In making these program decisions, we must consider both measures that can be implemented cost effectively in the near term as well as investments that can be made to reduce long-term costs and increase options for greenhouse gas reductions.

Recommendations regarding the Inclusion of Complementary Efficiency Policies in Federal Cap-and-Trade Legislation for Greenhouse Gases

To succeed in achieving significant GHG reductions by mid-century we need to enact a Federal climate action plan to ensure effective collaboration among all levels of government and to signal to energy producers, suppliers, and users, that we are serious about this commitment. The program should allow for states to be centers of innovation for greenhouse gas reduction strategies, and should respect states rights to pursue more innovative and aggressive cap and trade programs. States have the experience, regulatory infrastructure, and the programs in place to help ensure that national goals can be met, especially in the early years.

Federal legislation should provide for a greater allowance allocation to states than what is currently proposed in S. 2191. States are better able to use the proceeds of an allowance auction to promote the goals of the legislation. States have more experience than the federal government in implementing energy efficiency and promoting the development of renewable energy. An alternative to providing states the authority to auction allowances and use the proceeds to promote the goals of the program is to provide states with a portion of the proceeds from a federal auction.

Creating an aggressive energy efficiency program is of critical importance for any future state energy policy. We must meet the challenges ahead by being bold and innovative. This includes promoting renewable energy and environmental sustainability.

Although there will be costs associated with implementing the system benefits charge and energy efficiency portfolio standard programs in New York State, the financial benefits returned will outweigh the costs incurred.

Energy efficiency absolutely plays an important and complementary role in climate policy. If we are to effectively meet our carbon goals, we must link our clean air efforts with efficiency measures. Beyond benefits to addressing climate change, we also spur domestic economic growth associated with whole new energy efficiency businesses, industries and green collar jobs, for example, and take a significant step in our transition to a clean energy economy.

Thank you for the opportunity to testify before the Committee. I am happy to answer any questions the Members may have.

The CHAIRMAN. Our next witness is Commissioner Dian Grueneich, who was appointed to the California Public Utility Commission by Governor Schwarzenegger in 2005. We welcome you.

STATEMENT OF DIAN GRUENEICH, COMMISSIONER, CALIFORNIA PUBLIC UTILITIES COMMISSION

Ms. GRUENEICH. Thank you. I very much appreciate the opportunity to testify today.

I am the assigned commissioner in California at the California Public Utilities Commission overseeing the energy efficiency programs. We believe that the California program, which is currently funded at $1 billion annually, is the world's largest energy efficiency program. I was happy to hear from my colleague that we may be in close competition now with New York, that we welcome, on expanding our programs.

I am going to quickly cover today three items: first, an overview of what are the programs in California; second, some discussion of how we are trying to integrate our energy efficiency efforts into California's global warming law; and third, to offer my thoughts on what could be done in terms of bringing together energy efficiency and Federal climate change legislation.

If I could have the first slide very quickly.

This is just an overview that California has adopted as a formal policy in California, what we call a loading order, and this loading order places energy efficiency as the top priority. It requires that there be investment in all cost-effective energy efficiency as the resource of first choice. We have come to this policy as a result of 30 years of investments, both through our utilities, as well as building standards and appliance standards.

Next slide, please.

This is a slide that tries to graphically show what has been our experience in California on energy efficiency. You can see before 1970 we were similar to the rest of the Nation, dramatic increases in electricity. In the early 1970s, that is when we began our programs, and you can see that we have been successful in keeping our per capita consumption constant while the rest of the country has grown very significantly.

But let me tell you the economic story, which is what is very, very important. In looking at our State's gross State product, we generate nearly twice as much gross State product per kilowatt hour than the U.S. average, and we have tripled our gross State product in the last 30 years. So we believe that this emphatically demonstrates that you do not need to sacrifice economic growth and development when you undertake energy efficiency.

Next slide, please.

This is another way that we are demonstrating how we are getting the energy savings. That is the question that we are often asked, where does it come from? In California there are three principle areas. Down on the bottom you will see the savings over the 30-year history from our appliance standards.

The second area in green is the savings over the same 30-year period from our building standards. And then the top, which you can see is very significant, are the efforts that my agency oversees

with regard to utility programs. These combination of codes and standards and utility programs supply approximately 15 percent of California's total electricity supply. It is a very significant, a very successful way of meeting our electricity needs. Moreover we have a very aggressive program to be measuring and verifying to make sure that we are obtaining these savings because we use them in lieu of building power plants and transmission lines, and that is an absolutely necessary component of the programs.

Next slide.

This is what we are doing right now. For the period of 2004 through 2013, the programs that my agency is overseeing. Relying upon the utilities in the State, we are going to be eliminating the need for 10 new power plants. We are eliminating 9 million tons of carbon dioxide emissions. And then very importantly we are looking at $10 billion in net savings. You heard from New York that you get an approximately—for a dollar you spend on energy efficiency, you are saving $2. Energy efficiency is one of the most important, if not the most important, economic development programs we have in California.

Let me turn quickly to how we are looking at integrating AB 32, energy efficiency in AB 32. We have all of our State agencies, energy agencies, in California issued a decision earlier this year in which we have now made a unanimous recommendation that energy efficiency be the foundation upon which we rely for meeting our global warming efforts in California.

We have made the recommendation that the ARB requires that there be a statewide mandate to pursue all cost-effective energy efficiency in California. We are looking at approaching this in three ways. The first is our current approach to energy efficiency, that is providing tremendous savings, but we are looking at expanding it beyond that; and then with that layering on top of it, our cap-and-trade program.

The CHAIRMAN. I apologize, but your time has expired.

Ms. GRUENEICH. Thank you.

[The statement of Ms. Grueneich follows:]

Testimony of Dian M. Grueneich
Commissioner, California Public Utilities Commission
State of California
Select Committee on Energy Independence and Global Warming
U.S. House of Representatives
May 8, 2008

Thank you for the opportunity to testify today on the role of energy efficiency policies in reducing greenhouse gas (GHG) emissions that cause climate change.

My testimony will cover three areas. First, I will provide a brief overview of energy efficiency programs and policies in California. Second, I will discuss the on-going efforts in California to maximize our energy efficiency regulatory programs in order to achieve the GHG emissions reduction goals in the California Global Warming Solutions Act of 2006, which I will refer to as California Assembly Bill 32 or AB 32.[1] Finally, I will offer my thoughts on the integration of energy efficiency into regulatory and market mechanisms to address climate change.

Energy Efficiency Is California's Highest Priority Energy Resource

California has adopted as state policy a "loading order" of preferred electricity resources. This loading order requires investment in all cost-effective energy efficiency savings as the energy resource of first choice.[2] This policy choice reflects a 30 year history of implementing highly successful energy efficiency programs through the California Public Utilities Commission's (CPUC) utility regulatory programs and state building and appliance standards.

This focus on efficiency has resulted in tangible and significant financial benefits. Since 1970, California's per capita electricity usage has remained stable and is currently approximately half of the United States average. California's electricity bill is 1.79 percent of the state's gross state product (GSP) as compared to an average of 2.54 percent for the other 49 states combined, while the average Californian residential bill is 15 percent lower than the average bill for the rest of the United States.[3] California generates nearly twice as much GSP per kilowatt hour (kWh) than the U.S. average and has tripled its GSP in the last 30 years.

The CPUC oversees the state's investor-owned utility companies, which serve approximately 80 percent of Californians. Under our direction, these utilities currently invest approximately $1 billion annually in energy efficiency resources that cover every economic sector - residential, commercial, institutional, agricultural and industrial – across dozens of different micro-climates and a culturally diverse population. They also provide specialized energy efficiency programs for low income consumers. Over the period 2004 through 2013, the CPUC's energy efficiency programs will result in $10

billion in net savings for the state,[4] eliminate the need for ten 500 megawatt power plants, and eliminate 9 million tons of carbon dioxide emissions.

This investment in energy efficiency has a 2 to 1 return: for every dollar spent on energy efficiency, California customers avoid $2 in conventional electricity generation costs. This fact is more remarkable given that the energy efficiency programs include a large number of "non-resource" programs, such as public education and outreach, job training, and emerging technologies, which do not produce a direct reduction in energy usage. Currently, utility programs and building and appliance codes and standards supply approximately 15% of California's total electricity supply. These "negawatts" are measured and verified and integrated into the regulated utilities' short and long term plans to meet projected electricity demand.

California's successes in energy efficiency are due in large part to the state's acknowledgement that there are significant market barriers to energy efficiency and its willingness to use regulatory tools to reduce or overcome these barriers. For example, California "decoupled" earnings from sales for its regulated utilities over 20 years ago, with no ill effects on utility shareholders or ratepayers. Our portfolios of efficiency measures [5] include a wide range of measures designed to remove hurdles to efficiency. Some energy efficiency measures lower the higher upfront costs of efficient products through rebates and financial incentives; others bridge an information gap by providing building and equipment audits. Others fill a technical gap by funding development of new energy efficiency products. By instituting a centrally administered and funded regulatory system, California has enabled its utilities to aggregate small efficiency resources implemented by multiple actors that result in collectively large savings.

While California has accomplished much through energy efficiency, we know that we can and must due more. To that end, we are focusing now on strategies that will support behavior and market transformation so that energy efficiency truly becomes business as usual. We are also planning to adopt later this year a long-term strategic plan for energy efficiency in California through 2020 to make energy efficiency a way of life for all Californians.

Energy Efficiency is a Key Weapon in the Fight Against Global Climate Change

There is a growing consensus that energy efficiency is not only a tool for reducing GHG emissions, but necessary one, because it is available now and generates economic benefits that mitigate the impact of higher cost reduction measures. A recent Intergovernmental Panel on Climate Change (IPCC) study on global GHG mitigation potential concluded that the largest single source of potential reductions are efficiency measures in the building sector. In a December 2007 report, McKinsey & Company concluded that, in the United States, "At 710 megatons annually in the mid-range case, energy efficiency improvements in residential and commercial buildings (including the appliances inside) make up the largest cluster of negative-cost abatement opportunities."[6]

Preliminary estimates for California show that in 2020 energy efficiency can result in a net *savings* of $20 per ton of carbon dioxide reductions.

You may have heard that energy efficiency is the "no regrets" policy on global warming. California absolutely agrees. In other words, we would maximize energy efficiency investments even if there were no global warming problem, because energy efficiency provides a tremendous benefit to the California economy. Not only does it lower our energy bills, energy efficiency is in large part a domestically produced resource. From the research and development at our universities and Silicon Valley, through sale of equipment, to on-site installation by contractors, energy efficiency creates jobs throughout all sectors of our economy.

A major question we face in California is the role of energy efficiency in a global warming regulatory structure. The CPUC and the California Energy Commission (CEC)[7] have been tasked with providing recommendations to the California Air Resources Board (CARB) – the state agency responsible for implementing AB 32 - on treatment of the electricity and natural gas sectors under AB 32. In April, the California energy agencies unanimously recommended that CARB adopt a state-wide mandate set at the level of all cost-effective energy efficiency as a cornerstone of AB 32. We stated,

> We do not adopt the policy, as suggested by some parties, that we should eliminate mandatory targets for energy efficiency and/or renewables, and allow an AB 32 cap to govern instead. . . . .We firmly believe that our existing energy efficiency, renewables, and emissions performance standard policies are the foundation upon which other AB 32 policies should be built. [8]

The approach that the CPUC and the CEC has recommended to climate change is three-fold: (1) implement existing energy efficiency, renewable energy and emissions standards, (2) expand existing programs to achieve higher standards and/or to cover other actors, and (3) implement a cap and trade system to capture other cost effective reductions.

Energy efficiency is our most cost-effective weapon to combat climate change and must be fully deployed. Regulation of carbon alone or establishment of a cap and trade system is insufficient to effectively address climate change. We must harness energy efficiency and to do so, we must have specific policies, programs, and funding mechanisms that collectively work to overcome market barriers to energy efficiency.

Recommendations for a National Climate Change Policy

- **Clear Statement of Policy on Energy Efficiency.** Any legislation should state unambiguously that energy efficiency and productivity is the highest priority generation resource for all Americans.

- **National Energy Efficiency Requirements.** Adopt national energy efficiency goals with implementation left to individual states and discretion to institute more stringent standards.
- **States Must Retain Their Role In Working With Utilities And Others In Their State To Develop Efficiency Programs.** The current structure of shared federal and state authority to implement energy efficiency programs and standards should be retained. California has been a leader in developing efficiency standards for appliances that are later adopted by the federal government.
- **National Building Standards.** The built environment constitutes 51 percent of GHG emissions in the United States. The built environment includes construction materials, construction process, and occupation of buildings. National building standards for energy efficiency will have a huge, immediate and long-term impact on emissions. The State of California is committed to achieving zero net energy building standards for homes by 2020 and for commercial buildings by 2030. The national government should make a similar commitment and provide resources to assist in this effort on a national, state, and local level.
- **Decoupling.** Section 3301 (a)(2) of the Warner-Lieberman Bill provides that states and utility regulators should be encouraged (with allocations or auction revenues) to "make cost-effective energy-efficiency expenditures by investor-owned natural gas or electric utilities at least as rewarding to shareholders as power or energy purchases, or expenditures on new energy supplies or infrastructure."
- **Long-term Funding Mechanism.** Long-term funding is critical to ensuring that maximum savings from energy efficiency can be achieved. Assuming federal climate regulation will include auctions of GHG allowances, a significant dedicated amount of the revenue from such auctions should be made available to states for energy efficiency efforts.
- **Complementary Tax Structure.** The federal tax code should reward investments in energy efficiency, particularly for improvements for new and existing buildings.
- **Investment in Research and Development and Worker Training.** Federal investment in basic research for energy efficiency has dramatically decreased over the last decade. It is imperative that we invest in new technologies that will provide the efficiency savings for the next generation. The same applies to training for green collar jobs that will provide high wages and which cannot be moved overseas.
- **A National Strategic Plan on Energy Efficiency**. The National Action Plan on Energy Efficiency has laid the groundwork for a comprehensive plan on energy efficiency that will fundamentally change the usage of energy in this country. This effort should be continued and expanded.

Conclusion

Energy Efficiency is the single most important opportunity for reducing GHG emissions and addressing our nation's energy needs. However, I urge you to act quickly, and if need be, to implement a national law on energy efficiency before climate change legislation. Buildings are being constructed, maintained and repaired, and equipment and appliances are being replaced, every day. Every year in which energy efficiency opportunities, including more aggressive building and appliance standards, are not implemented means that we are forgoing inexpensive resources today and making it more costly to take action in the future. The lack of building and appliance standards to drive new builds and purchases towards higher efficiency *now* directly translates to higher costs for retrofits down the road.

It has been an honor to testify before you and I welcome any questions you may have.

---

[1] California Health and Safety Code, Div. 25.5, §§38500, et seq.
[2] Energy Action Plan II, http://docs.cpuc.ca.gov/published/REPORT/51604.htm; see also, CA Public Utilities Code § 454.5(b)(9)(C).
[3] Next 10, 2008, *California Green Innovation Index*, p. 21.
[4] The net savings reflects the avoided costs of constructing a new natural gas generation facility minus the cost of implementing the energy efficiency measures.
[5] IPCC 2007, *Fourth Assessment Report, Working Group III Report.*
[6] McKinsey & Company, 2007, *Reducing U.S. Greenhouse Gas Emissions: How Much and at What Cost?*, p. 34.
[7] The California Energy Commission is responsible for providing technical, scientific and policy research and information development on the energy sectors of the California economy.
[8] Decision 08-03-018, March 13, 2008, http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/80150.htm , p. 36.

The CHAIRMAN. You will get an opportunity in the question-and-answer period.

Again, as I announced earlier, there are a series of roll calls on the House floor. At this point the committee will have to take a brief recess, and after the roll calls we will return. Thank you.

[Recess.]

The CHAIRMAN. We will reconvene our hearing. We apologize to our witnesses and the audience, but I think we can conclude the hearing now, hopefully, without any further interruptions.

Our next witness is George Sakellaris, who is from my home State of Massachusetts. He is the president and chief executive officer of Framingham-based Ameresco, the largest independent energy services company in the country. We welcome you, sir. Whenever you are ready.

STATEMENT OF GEORGE SAKELLARIS, PRESIDENT AND CEO, AMERESCO, INC.

Mr. SAKELLARIS. Thank you, Mr. Chairman, distinguished members of the committee. Thank you for providing me this opportunity to testify before you this morning on the role of efficiency policies and climate legislation. I also want to commend you, Chairman Markey, for your leadership role in energy efficiency and energy independence. No one in Congress has taken a more active role on this critical issue than you, Mr. Chairman.

As background, I am George Sakellaris, founder, president and chief executive officer of Ameresco in Framingham, Massachusetts. Ameresco presently is the largest privately held, independent energy services company providing energy savings through what is known in the industry as performance contracting services in North America, with over 500 employees in 52 offices located throughout the U.S. and Canada.

Ameresco provides a full array of services for our clients, which include energy conservation and renewables, including landfill gas, biomass, wind and solar.

Mr. Chairman, that is a brief description of Ameresco, and now I will directly address some of the questions posed in front of us today.

The opportunity for energy efficiency savings in the United States is enormous. The United States is presently using approximately 47 million barrels of oil equivalent per day, or 17 billion barrels of oil equivalent per year. Based on our experience we have found that we as a Nation can save as least 20 percent of that energy and possibly 30 percent of our usage. And we say that because for the last 30 years that we have been in this business, we have achieved that result for each and every facility that we have implemented an energy savings program, and in many cases much more than that.

If then we assume, and to be conservative, that we can only save 20 percent, then the total U.S. productivity improvement is equal to over 9 million barrels per day, or the equivalent of 3.4 billion barrels per year. Now, if we assume at the cost of $100 per barrel, which is the price of oil, and today somebody can argue it is considerably higher than that, then the resulting annual savings are $340 billion per year.

Now, if we assume that we have a simple payback of 7 years, then an investment of $2.4 trillion would be required in order to achieve the savings. Then if we take it one step further and assume a 15-year plan for the implementation, is required $160 billion of investment each year, and that will create over 3.2 million jobs per year to 5 million jobs per year.

Now, when we achieve these energy savings, of course, we will reduce greenhouse gas emissions by the corresponding 20 percent. In other words, for 5.9 billion metric tons of CO_2 today that we have at 20 percent reduction would be 1.2 billion metric tons per year.

So therefore, as we move forward in our national energy policies, we believe that it is extremely important that Congress should include energy efficiency as an integral and as the most important aspect of any climate change legislation. And the reason behind it is because it is the most economic, and it has the most immediate impact in our society.

The legislation should further include energy efficiency renewable centers that include quantitative end use savings targets, specific targets for each and every year. This will accelerate the implementation of energy efficiency equipment. And the Federal Government should require all retail sellers—electrical utilities, gas utilities, oil dealers, et cetera—to make investments such as 1.6 percent per year reduction in their energy use. And I use the 1.6 per year so that by the year 2020, we will have achieved the 20 percent reduction in energy use and the corresponding 20 percent reduction in emissions.

In addition, emission allowances should be held in trust for the public good. We are opposed to the grandfathering of emissions allowances to firms based on historical emissions. The allowances should be sold through what we call public auctions. Then Congress should describe exactly how the proceeds from these auctions will be distributed. We recommend that at least 50 percent of the proceeds be dedicated to energy efficiency investments.

If we make this national commitment to energy efficiency, we can accelerate the realization of energy savings by buying down projects, let's say, from 10 years to 7 years and then expand the opportunity and hopefully get from the 20 percent level to the 30 percent level.

Also, by investing in energy efficiency, the Congress can reduce overall energy costs for individual customers, business and institutions. This investment will also reduce energy demand, and, as I pointed out emissions, and substantially mitigate the overall cap-and-trade program costs. So you are using the energy efficiency in order to mitigate the cap-and-trade cost.

Of course, associated with all of this, you will reduce substantially the foreign—dependence on the foreign oil, and the trade deficit, it will take it down by 20 percent.

So, Mr. Chairman, again, thank you for allowing me the opportunity to come before you and the distinguished committee, and I will be glad to answer any questions that you may have. Thank you.

The CHAIRMAN. Thank you very much.

[The statement of Mr. Sakellaris follows:]

GEORGE SAKELLARIS
PRESIDENT & CHIEF EXECUTIVE OFFICER
AMERESCO, INC.

BEFORE

THE SELECT COMMITTEE ON
ENERGY INDEPENDENCE AND GLOBAL WARMING
EDWARD J. MARKEY, CHAIRMAN

MAY 8, 2008

Mr. Chairman and distinguished Members of the committee, thank you for providing me this opportunity to testify before you this morning on the Role of Efficiency Policies in Climate Legislation. I also want to commend you Chairman Markey for your leadership role on energy efficiency and energy independence! No one in the Congress has taken a more active role on these critical issues than you Mr. Chairman.

As background, I am George Sakellaris, founder, President and Chief Executive Officer of Ameresco, headquartered in Framingham, Massachusetts.

Ameresco is presently the largest, privately held, independent energy services company (ESCO) providing energy savings performance contracting (ESPC) services in North America with over 550 employees in fifty-two offices located throughout the United States and Canada. Ameresco provides a full array of services to our clients which include energy conservation measures

and renewable energy including landfill gas, biomass and solar electric power, known as photovoltaic (PV) technology.

Ameresco has a broad range of expertise in multiple energy related issues. We have the intellectual and financial knowledge that enables us to develop custom tailored solutions that improve efficiency, productivity and financial performance for our clients.

Mr. Chairman, that is a brief overview of Ameresco and now I would like address the questions the Select Committee has put forward this morning.

The opportunity for energy efficiency savings in the United States is enormous. The United States is presently using approximately 47 million barrels of oil equivalent per day or 17 billion barrels of oil equivalent per year. Based on our experience we have found that we as a nation can save at least 20% to 30% of our usage,

because for the past 30 years we have achieved that result for each facility we have completed.

If we assume that we can conserve 20%, then the total US productivity improvement is equal to 9 million barrels of oil equivalent savings per day or 3.4 billion per year. At a cost of $100 per barrel, the resulting savings are $340 billion per year. Assuming a seven year simple payback, a total investment of $2.4 trillion would be required to achieve these savings. A 15 year plan of implementation will require $160 billion of investment each year, while creating over 3.2 million jobs.

When we achieve these energy savings, we will reduce Greenhouse gas emissions from the current baseline of 5, 890 million metric tons per year and should approach 20% or 1,178 million metric tons per year.

In 2007, the ESCO industry implemented over $4 billion in energy saving projects. ESCO's like Ameresco help people identify savings opportunities, design efficiency measures, secure financing, and in some cases, operate and maintain the efficiency measures. In short we help bridge the gap in knowledge, financing and construction for energy efficiency measures. Ameresco provides the array of services that move forward the installation of billions of dollars of efficiency measures. Without our services, many cost-effective energy efficiency measures would never be installed.

The energy projects we develop consist of numerous energy efficiency measures that are bundled together into a single project including implementation and financing. Ameresco provides a savings guarantee to the customer to assure that savings are sufficient to amortize the investment required.

I would like to share a few illustrative examples of the type's projects Ameresco has implemented.

Ameresco developed and implemented a $30 million comprehensive energy efficiency project for the Chicago Housing Authority. These projects typically yield 30% to 40% energy savings by implementing building envelope, lighting, heating, cooling and appliance energy saving measures.

In 2005, the Long Island Power Authority (LIPA) hired Ameresco to save 5 MW for its customers who use 145 kW more of power. In two years, working with local contractors, Ameresco saved 5 MW of capacity from a broad mix of customers, e.g., supermarkets, retail stores, parking garages, manufacturers, office buildings, warehouses, etc. Savings were demonstrated through measurement and verification procedures using the International Performance Measurement and Verification Protocol required for federal ESPC projects and approved by LIPA.

The Congress should include energy efficiency as an integral part of any climate change legislation. The legislation should include Energy Efficiency Resource Standards (EERS) that include quantitative for end use energy savings targets, to accelerate the implementation of energy efficiency equipment, the federal government should require all retail sellers of energy (e.g., electric utilities, gas utilities, oil dealers, etc.) to make investments such that 1.6% of their current energy sold is saved every year.

Emission allowances should be held in trust for the public good. We are opposed to the grandfathering of emissions allowances to firms based upon historical emissions. The allowances should be sold through public auction. The Congress should prescribe how the proceeds from the auction should be distributed. We recommend that at least 50% of the proceeds be dedicated to energy efficiency investments. If we make this national commitment to energy efficiency we can accelerate the realization

of energy savings by buying down projects from a ten year to seven years or less simple payback. By investing in energy efficiency the Congress can reduce overall energy costs for individual consumers, businesses and institutions. These investments will also reduce energy demand, emissions and mitigate the overall cost of a cap and trade program.

Mr. Chairman, thank you once again for allowing me to come before your distinguished committee.

I would be happy to answer any questions you may have.

Thank you.

The CHAIRMAN. Our next witness is Steven Kline, who is the vice president of corporate environmental and Federal affairs for the PG&E Corporation. Welcome, sir.

STATEMENT OF STEVEN KLINE, VICE PRESIDENT, ENVIRONMENT AND FEDERAL AFFAIRS, PACIFIC GAS AND ELECTRIC CORPORATION

Mr. KLINE. Thank you, Chairman Markey, Ranking Member Sensenbrenner and members of the Select Committee. I am honored to be here on behalf of PG&E Corporation to share our experience and perspective on the role of energy efficiency policies and climate legislation.

When we look at the options for addressing climate change, it is clear to us that energy efficiency has to be a front-line response. The potential greenhouse gas reductions from energy efficiency are substantial. The technology is in almost all cases available today, and the investments are highly cost-effective, especially relative to supply-side options. In addition, customers like it. The highest marks we get from our customers are relative to our interactions with them around energy efficiency programs and procedures. In fact, aggressively pursuing energy efficiency could increase overall economic productivity.

I am not going to go into details on the McKinsey study, which others have mentioned, that are in my written testimony, but move to a few comments on the strategic levers that we found in California which may be hopefully helpful. One is that using financial and regulatory mechanisms to align energy efficiency with utility business interest is critical. This includes eliminating the traditional link between earnings in energy sales, and it removes the disincentive to promote energy efficiency.

By also establishing multiyear program periods with aggressive goals, combined with the financial incentives for achieving energy efficiency savings, regulators can drive utilities to aggressively pursue savings and partnership with their customers.

Another important strategic lever is establishing building codes and appliance standards. These provide the foundation for all other energy efficiency efforts and serve as a catalyst for new technologies, programs and practices.

Another strategy is providing incentives and reforming tax policies to facilitate deployment of new highly efficient, smart technologies in distributed generation. The utility industry is poised to make approximately $900 billion in transmission and distribution infrastructure investments over the next 20 years. We should look to ensure that these investments are channeled to help build the good of the future, one that is itself efficient, and that also facilitates utility customers being more efficient.

Comprehensive climate change legislation can also use allowance allocation and auction revenues to advance energy efficiency and dismantle market and regulatory barriers. For example, the Lieberman-Warner bill uses allowances and auction revenues in this manner. The bill includes numerous incentives for States, utilities, manufacturers and consumers to aggressively pursue energy efficiency. Examples include targeting of auction revenues to buy down costs of new efficient end use technologies, and providing al-

lowances to serve load-serving entities for the amount of electricity their customers save.

The bottom line is that energy efficiency is the deepest untapped reservoir of cost savings, avoided air emissions and greenhouse gas reductions available in our Nation today. Any prudent climate strategy must look to fully harvest this resource as quickly as possible.

Thank you again for the opportunity to be here today.

The CHAIRMAN. Thank you, Mr. Kline, very much.

[The statement of Mr. Kline follows:]

Testimony of Steven L. Kline
Vice President, Corporate Environmental and Federal Affairs
PG&E Corporation

Before the

Select Committee on Energy Independence and Global Warming
United States House of Representatives

Legislative Hearing on
"Negawatts: The Role of Efficiency Policies in Climate Legislation"

May 8, 2008

Chairman Markey, Ranking Member Sensenbrenner, and Members of the Select Committee, I am very pleased to appear before you this morning to offer my views on the role of energy efficiency policies in climate legislation. I believe climate change is one of the most pressing issues of our time. It is clear that the link between greenhouse gas emissions and the Earth's warming climate is sufficient to warrant an aggressive response, as the potential consequences are serious and the need for action urgent.

PG&E Corporation is an energy holding company headquartered in San Francisco, California and the parent company of Pacific Gas and Electric Company. Pacific Gas and Electric Company is California's largest utility, providing electric and natural gas service to more than 15 million people throughout northern and central California. PG&E is a recognized leader in energy efficiency and has among the cleanest mix of electric power of any utility in the country.

Our work on energy efficiency and support of clean generating technologies is part of a broad portfolio designed to provide advanced energy solutions for our customers.

Through technology and innovation we help our customers to meet their energy needs, while providing unique opportunities for them to manage their energy use, reduce costs, promote new technologies and address climate change.

Energy Efficiency Must be a Frontline Response to Address Global Warming

Existing energy efficiency technologies can dramatically and quickly help the U.S. to slow and stop current emissions trends and do so in a way that will increase the overall productivity and efficiency of the economy. For example, the American Council for an Energy Efficient Economy estimated that the energy efficiency measures focused on the building, residential and commercial sectors included in the Energy Independence and Security Act of 2007 could result in emissions reductions on the order of 250 million metric tons per year by 2030. A McKinsey Global Institute (McKinsey) study of world-wide ghg reduction opportunities concluded that, through energy-efficiency, it is possible to reduce the growth rate of global energy consumption by more than 50 percent over the next 15 years. And McKinsey said this can be done using the technology that is available today. Finally, PG&E was an underwriter of a recent follow-on study undertaken by McKinsey on the potential for energy efficiency savings in the U.S. The study found that energy efficiency improvements in residential and commercial buildings (including the appliances inside) make up the largest cluster of negative-cost greenhouse gas abatement opportunities, on the order of 710 megatons annually. Most improvements use existing technologies; 70 percent (500 megatons) are available before 2020. Together, these opportunities could offset 70 percent of the incremental power load forecast in McKinsey's reference case forestalling the need to build many new power plants projected through 2030.

These important abatement opportunities represent potential opportunities, however, meaning that regulatory and market barriers exist to realizing this potential. This is why the hearing today is so important, as there are significant ways by which Congress can facilitate these efforts.

For example, in its recommendations to Congress as part of a comprehensive climate policy, the United States Climate Action Partnership (USCAP), of which PG&E is a founding member, provided a listing of policies that could complement a federal climate bill, including the following:

- Aligning financial and regulatory incentives with utilities' business interests to pursue energy efficiency;

- Developing and implementing stronger energy efficiency codes and standards for whole buildings and for equipment and appliances;

- Providing incentives and reforming tax policies to facilitate deployment of, and advance the infrastructure necessary to support, new "smart" and highly-efficient technologies and distributed generation; and

- Creating incentives to go beyond existing standards to produce additional energy savings.

For convenience, attached please find the USCAP recommendations for energy efficiency.

Comprehensive climate change legislation can also utilize emissions allowance allocations and auction revenues to advance energy efficiency and dismantle market and regulatory barriers. For example, the Lieberman-Warner Climate Security Act, as reported from the Senate Environment and Public Works Committee, uses allowances and auction revenues in this manner. The bill includes numerous provisions that provide significant incentives for states, utilities, manufacturers and consumers to aggressively pursue energy efficiency, such as: providing incentives for states to pursue policies that "decouple" electric utility revenues from sales and implement aggressive building codes and standards; targeting of auction revenues to "buy-down" costs of new energy efficient end-use technologies; and providing allowances to load serving entities for the amount of electricity their customers save

California and Energy Efficiency

California has been a leader in energy efficiency for more than three decades. Consistent and dedicated efforts by policy makers and utilities to increase energy efficiency in the state have achieved remarkable results. Moreover, the state's *per capita* electricity consumption has remained flat over the last three decades, while *per capita* electricity consumption for the United States during the same period has increased by approximately 50 percent.

Over the next several years, California is poised to build on this success by meeting approximately one half of its expected growth in electricity demand through energy efficiency. PG&E expects to meet this aggressive goal and will do so through a variety of measures and programs, which are supported by established regulatory structures and other efforts.

The following summarizes what has helped California be successful to date, as well as what PG&E is doing to achieve these aggressive energy efficiency goals going forward:

- *A supportive regulatory structure and environment.* Many rate designs create financial disincentives for utilities to promote energy efficiency. California's model of "decoupling" removes these disincentives: utility revenues and earnings are independent of actual energy sales. Decoupling eliminates the financial incentives that are found in some state regulatory schemes for selling ever-increasing amounts of energy (i.e., the financial incentives are "coupled" with growth in power sales). Under California's decoupling framework, the state's utilities collect no more and no less than the revenues necessary to run their business and provide a fair return to shareholders. If sales rise above these levels, the extra revenues go back to customers, rather than to the bottom line of the company; if sales fall below intended levels, utilities are assured they can recover the shortfall going forward. Energy efficiency goals can be achieved even more effectively if decoupling is combined with incentives that help motivate utilities to promote and embrace energy efficiency and put it on par with similar investment opportunities, such as building new generating facilities. California pioneered such incentives in the 1990's, and has recently adopted a system whereby utilities' shareholders can earn if the company delivers real energy savings to customers

  In addition to properly aligning incentives for utilities, California has recognized the need for long-term commitment to energy efficiency and has established a consistent regulatory environment for the development and support of leading energy efficiency efforts. For example, California's current cycle for program development and investment is three-years. By providing PG&E with a three-year energy savings target and the authority to fund these efforts over this time period, we are able to establish programs and measures, and engage

with customers on some high-value efforts that have longer lead-times. We are also working on provisions for the next funding cycle that will allow us to work with customers who are designing new facilities many years in the future. By making commitments to enhanced energy efficiency early in the design process, customers can have assurance that the incentives will be available to them even though construction will be completed several years in the future. One example is the expected longer lead-time reconstruction of a significant number of California hospitals.

By having an established savings target and consistent level of funding over multiple years, we are also able to work with manufacturers and distributors of products and energy efficient equipment, because we can make multi-year commitments to support commercialization and deployment efforts.

And, finally, California has put significant emphasis on developing evaluation, monitoring and verification (EM&V) programs to track and account for these savings. California is continuing to refine EM&V methodologies to be transparent, consistent and understandable, and to further acceptance of energy efficiency investments by customers and utility shareholders.

- *Partnerships with other utilities, regulators, customers, and other stakeholders.* California's success with energy efficiency is the result of a cooperative working environment at all levels. For example, PG&E has partnered with local governments to help them reduce energy usage, save money, achieve environmental goals and provide additional community benefits. One example is our partnership with Sonoma County, which established the Sonoma County Energy Watch Partnership. Through this program, which is one of 22 local and statewide partnerships throughout our service area, PG&E will work with county representatives to improve energy efficiency and reduce greenhouse gas emissions from residences, schools, colleges, retail stores, office buildings, the high-tech sector and agricultural interests. Some of the key activities include facilitating "building tune ups," supporting energy efficiency retrofits in wastewater and water treatment facilities, conducting outreach to realtors and

home inspectors to use inspections to identify energy saving opportunities, and conducting targeted energy audits, outreach, and training.

- *Efficiency improvements in building codes and appliance standards.* Approximately half of the energy savings achieved over the past three decades in California are the result of the State's aggressive building codes and energy efficiency standards for end-use equipment and appliances. These codes and standards provide the foundation for all other energy efficiency efforts and serve as a platform from which new technologies, programs and practices are established. PG&E has dedicated employees that support the efforts of the California Energy Commission, the U.S. EPA's EnergyStar Program and others through our Codes and Standards Enhancement program. The program advocates the inclusion of energy-efficiency measures in state codes for buildings and appliances and conducts studies that assess the costs and benefits of the proposed changes.

- *Including manufacturers and distributors in efficiency efforts.* PG&E works directly with manufacturers of energy efficient products and equipment as well as distributors to help develop and commercialize energy-efficient technologies. PG&E will use part of the nearly $1 billion we will spend to support our energy efficiency efforts through 2008 to "buy-down" the costs of these products and equipment prior to them reaching the mass market. For example, PG&E works with both the manufactures of compact-fluorescent lamps (CFLs) as well as the retail outlets, such as Costco Wholesale Corporation, that sell the product to reduce the price paid by the consumer at the time of purchase. This helps to simplify the process for the consumer and make these highly-efficient bulbs more competitive. As a result of these efforts, we expect as many as 20 million CFLs to be purchased this year in our service area alone.

In addition to working to advance the market penetration of existing energy efficient products, PG&E operates an Emerging Technologies program to accelerate commercialization of new energy-efficient technologies. The program identifies promising technologies for PG&E to promote to our customers by screening and assessing newly-commercialized technologies, and identifying and establishing channels to deploy these new

energy efficiency solutions. With a $3.7 million annual budget, PG&E's Emerging Technologies program is targeting more than 50 technologies, including light dimming fixtures for commercial building stairwells that go to full brightness when someone enters the stairwell, energy-efficient desktop computer power supplies, automated power management for commercial buildings and energy-saving cooling systems for computer data centers.

- *Creating targeted customer programs, outreach and education efforts.* PG&E has 85 dedicated energy efficiency programs and hundreds of measures available to provide energy solutions to our customers. This allows us to create targeted energy solutions that meet our customers' needs and maximize energy saving opportunities. These programs are segmented by customer class and type and supported by professionals knowledgeable about the customer segment being targeted. Some examples of programs and measures include comprehensive energy audits for industrial customers, refrigerator recycling programs for residential customers to facilitate deployment of more energy-efficient products, financial incentive programs for virtualization projects in data centers, air conditioner refrigerant charge and air flow checks for residential and small commercial customers in air-conditioning-intensive regions of our service area, and design assistance and incentives for refrigerated warehouses and other aspects of the agricultural and food processing sector.

In addition to these targeted programs, we work closely with the other utilities in California, state and federal agencies, energy efficiency and environmental groups, manufacturers and retailers, and other stakeholders to educate our customers about the environmental and cost-savings benefits of energy efficiency and the programs available to help customers. An aggressive education and outreach program is critical to overall success, as we must work closely with our customers and provide them with the necessary information so that they can make informed choices. We conduct these education and outreach efforts in multiple languages to ensure that all of our customers are able to participate fully and realize the benefits of these programs and measures.

The Time Is Now

Our country has a historic opportunity to change the way we produce and use energy in ways that will lower the threat of climate change, improve our environment and benefit our economy. Doing this will require a cooperation at all levels of government and a change in the practices and policies of the past. Being more energy efficient, more energy independent and advancing technologies that will be needed around the world is not only achievable, but also imperative if we are to successfully address global warming and have the U.S. regain its leadership position in the international community. PG&E is committed to being a pragmatic, responsible participant in this effort and looks forward to Congress building on the solid foundation of the Energy Independence and Security Act of 2007.

On behalf of PG&E, I want to thank you for the opportunity provided today. I appreciate the commitment of this Committee to advancing energy efficiency as a priority resource and addressing global warming.

Thank you.

###

The CHAIRMAN. And our final witness is Mr. Richard Cowart, who is the director of the Regulatory Assistance Project, which is a nonprofit organization that provides research analysis and educational assistance to public officials on public electric utility regulation.

We welcome you, Mr. Cowart. Please go ahead.

STATEMENT OF ROBERT COWART, DIRECTOR, REGULATORY ASSISTANCE PROJECT

Mr. COWART. Thank you. Chairman Markey, I appreciate the opportunity to speak with you today about the critical role that end use energy efficiency can play to reduce greenhouse gas emissions, contain the cost of climate legislation and to protect the environment.

The most important message I can deliver today is that national climate legislation absolutely must be designed to call forth to the greatest degree possible low-cost end use efficiency investments, a message you have heard now from, I think, all of us today. The good news is that this actually can be done. The challenging news is that most climate legislation, including most cap-and-trade legislation, is badly designed to deliver efficiency.

We have seen great attention to delivering price signals and on supply-side investments, but much less attention to cost containment through efficiency. So one of the key questions facing Congress is going to be, how can cap-and-trade systems be designed to accelerate investments in energy efficiency?

My written testimony addresses four points which I will touch on here. First, echoing the comments of the other panelists, energy efficiency is the low-cost equivalent of the carbon scrubber for the electric power sector and the most important resource we need to look to as the bridge fuel to a low-carbon power sector in the coming decades.

Secondly, the cap-and-trade architecture used in the Acid Rain program and copied in other systems like the European carbon trading system, is frankly not optimal for carbon management. It focuses on smokestacks, and by awarding carbon allowances to emitters on the basis of historic pollution, they cost consumers more than they should, and they miss crucial opportunities to enhance end use efficiency.

I work with air regulators quite a lot, and I often ask them what did the Acid Rain program do to advance energy efficiency? And most of the time they just sort of look at me quizzically. And then they say, well, it didn't do anything for energy efficiency. Cap and trade wasn't designed to deliver energy efficiency in customer locations. It was designed to change behavior at power plants.

But energy efficiency happens at customer locations. So if we are going to use cap and trade for carbon, we are going to have to change the architecture of cap and trade to do a much better job for efficiency.

My third point is about prices, sure a timely topic in today's economy. And as the others have said, efficiency is the best cost-containment strategy we can think of as part of cap and trade. Now, adding a carbon price signal to the price of electricity is directionally correct, but trying to reduce emissions through price alone

is going to be much more costly, and it will actually save less carbon than a cap-and-trade program that builds efficiency through its architecture and relies less on price pressure. This is a point that is often overlooked by regulatory economists, but I can tell you, Mr. Chairman, that it has not been overlooked by the Governors and legislators in the 10 RGGI States that actually studied the issue and tried to design a cap-and-trade program.

People are often surprised to learn how hard it is to reduce power-sector carbon through price signals, whether delivered through carbon taxes or through auctions. At the consumer level demand, as we know, is highly inelastic, and higher power prices alone are not going to reduce demand enough to meet our carbon goals.

We have the same problem for different reasons at the generator level. It requires a very high carbon price to make a meaningful change in greenhouse gas emissions through the redispatch of the existing U.S. generation fleet. This is true in coal regions and in gas regions. An EPRI study in the Upper Midwest found that carbon prices would be high enough to double the wholesale price of power. It would lower emission by only 4 percent. Studies in California right now are finding that even at $90 a ton, carbon prices cause very little change in California's dispatch.

Fortunately there is a way out of this high-cost approach. A crucial design, a crucial fact is that the same dollar cost in rates, efficiency programs will save five to seven times more carbon than would result from carbon taxes or credit markets alone. We need to integrate that kind of thinking into the design of cap-and-trade programs.

How can we do this? Two suggestions. The experience of the RGGI States provides a great lesson for us. After studying this issue extensively, the RGGI States realized that the best results for consumers and the environment would be to auction allowances and invest the money in energy efficiency.

The CHAIRMAN. If you could summarize, please.

Mr. COWART. I have one sentence.

Congress has the opportunity to build on this experience through a national performance-based efficiency allocation in which a significant fraction of national allowances would be awarded to States or entities appointed by States on the basis of their performance over time in reducing emissions from their own historic baselines.

Thank you very much.

The CHAIRMAN. I thank you.

[The statement of Mr. Cowart follows:]

Testimony of Richard Cowart
Director, Regulatory Assistance Project

Before the
Select Committee on Energy Independence and Global Warming
U.S. House of Representatives
Hearing on Efficiency and Climate Policy
May 8, 2008

Carbon Caps and Efficiency Resources:

How Climate Legislation Can Mobilize Efficiency and Lower the Cost of GHG Reduction

INTRODUCTION

Chairman Markey, Ranking Member Sensenbrenner, and members of the Committee, I appreciate the opportunity to speak with you today about the critical role of end-use energy efficiency in reducing greenhouse gas emissions and lowering the cost of climate legislation to consumers and to the American economy. I am Richard Cowart, a Director of the Regulatory Assistance Project, a non-profit organization that provides technical and policy research and assistance to governmental decision-makers on energy and environmental issues. RAP has worked in more than 40 US states and has trained government officials in 16 other nations. Prior to joining RAP I served for 13 years as Commissioner and Chair of the Vermont Public Service Board, and for five years as an Assistant Professor of Planning and Environmental Law and director of the Program in Planning and Law at the University of California, Berkeley. Over the past four years I have had the privilege to assist the state and regional initiatives working to design carbon cap-and-trade programs in the US, including the Regional Greenhouse Gas Initiative (RGGI) in the Northeast, and the California, Oregon, and Western Climate Initiatives in the West. My testimony today grows out of all of these experiences.

Summary:

My testimony focuses on *how cap-and-trade systems can be designed to accelerate investments in energy efficiency,* which would permit more rapid carbon reductions at lower cost to consumers and the American economy. It follows four key points:

- Energy efficiency is the low-cost equivalent of a "carbon scrubber" for the electric power sector, and the most important resource to look to as the bridge fuel to the low-carbon power sector we need in coming decades;
- The cap-and-trade architecture used in the US Acid Rain program, and copied in other systems such as the European carbon trading system, is not optimal for carbon management. By focusing on smokestacks, and by awarding carbon allowances to emitters on the basis of their historic pollution, these programs cost consumers more than

needed to achieve a given level of reduction and miss an important opportunity to enhance energy efficiency, which is the least expensive and most effective way to lower carbon output.

- Although adding a carbon price signal to the cost of electricity is directionally correct, cap-and-trade programs that try to reduce emissions through price alone will be much more costly and will save less carbon than a cap-and-trade program that includes proven techniques to deliver low-cost efficiency resources. At the consumer level, higher power prices alone will not reduce demand nearly enough to meet our carbon goals. At the generator level, it requires a very high carbon price to make a meaningful change in the dispatch of the generation fleet. In both cases, the prices required to produce deep reductions are high enough to raise practical political barriers to the reductions now called for by climate science.

- Fortunately, there are alternatives. Modified cap-and-trade designs are being developed in the Northeast, in California, and elsewhere that would make efficiency an integral part of the carbon-reduction program and lower the cost of GHG reductions by allocating allowances for consumer benefit, and investing allowance values in programmatic efficiency measures. Congress should build on this state and regional experience by creating **a performance-based "efficiency allocation"** of carbon credits in any national cap-and-trade program now being developed.

STATEMENT

There are very good reasons that national climate legislation, as well as Governors, legislators, and environmental advocates are focusing on the power sector to lead the move to a lower-emissions economy. The main reason is that the power sector is the largest single source of industrial pollution, accounting for 38% of US global warming gasses.[1] Emissions from the US power sector[2] exceed the total *national* GHG emissions of every other nation except China.

The sector is also traditionally regulated, is not vulnerable to international competition, and consists of a reasonably small number of known sources. It not a surprise that major cap-and-trade efforts on both coasts have begun first with the power sector – the utility sector is probably the easiest large sector to manage. The sector is also expected to supply a large fraction of total emissions reductions sought under national climate bills.

However, significantly reducing emissions from the power sector will not be easy. About half of the nation's electric power comes from coal generation, and coal use continues to grow. After a decade in which natural gas combined cycle plants provided the large majority of new capacity additions, gas prices and availability concerns are driving renewed interest in coal for new

---

[1] U.S. EPA, "National Emission Inventory. Air Pollutant Emission Trends." Current Emission Trends Summaries, 2001. See http://www.epa.gov/ttn/chief/trends/index.html and Environmental Protection Agency, eGRID, Emissions & Generation Resource Integrated Database, www.epa.gov/cleanenergy/egrid/.

[2] Electric power production in the US produced 2,233.4 million metric tons of CO2 in 2001. Source: EIA State Energy-Related Carbon Dioxide Emissions by Energy Source, 2001. See http://www.eia.doe.gov/oiaf/1605/ggrpt/pdf/appc_tbl2.pdf.

generation, with "upwards of 90 GW [of new coal generation capacity now] on the boards."[3] Load growth continues, renewable sources can cover only a part of the new demand, and nuclear power is unlikely to provide significant new capacity to regional grids. Meanwhile, fossil fuel prices continue to rise.

I. The Critical Role of End-Use Efficiency in Meeting Carbon Reduction Goals

To many knowledgeable observers, the obvious solution to power system challenges is aggressive, accelerated investments in energy efficiency. Several well-documented studies demonstrate that the cost-effective reservoir of efficiency opportunities is large enough to meet 50% to 100% or more of all new electric demand.[4]

In addition to being quite large, the efficiency reservoir can be tapped at low cost. End-use efficiency is the least costly means to significantly reduce carbon emissions from the power sector. Cost-effective efficiency provides "avoided tons" of carbon at negative cost – by any measure less expensive than displacing fossil fuels with low-emission generation. In electricity markets, the efficiency savings potential has been shown to be on the order of 25% of total electricity usage, at a levelized cost of about 3 cents per kilowatt-hour.[5] This is much less than the average national retail price of electricity, currently at more than 8 cents per kWh[6] or even the marginal generation cost of new power plants, estimated, depending on the technology, to cost 5 to 10 cents per kWh and higher. Energy efficiency is the equivalent of a low-cost "carbon scrubber" for the power sector.

The *emissions* reduction potential is also quite large. IPCC studies, for example, reveal that across many sectors, the efficiency potential is quite large, with the largest single source of GHG emission reductions occurring in the buildings sector through efficiency actions.[7] Another recent study[8] by the McKinsey consulting firm found that by 2050, energy efficiency could reduce United States carbon dioxide emissions by 40%: 16% from buildings, 13% from transportation and smart growth, and 11% from industrial efficiency. The McKinsey study results are shown graphically in Figure 1 below.

---

[3] "Coal: America's Energy Future," Coal Leader Vol. 39, No.4, April 2006, p.6. Even though a number of planned coal plants have recently been canceled or delayed, as of October 2007, there were at least 24 new plants (12,500 MW) under construction, and another 21 plants (over 11,000 MW) already permitted and/or nearing construction (National Energy Technology Lab OSAP 10/10/2007).

[4] See, e.g., Interlaboratory Working Group, *Scenarios of US Carbon Reductions: Potential Impacts of Energy Technologies by 2010 and Beyond* (September 1997) at pages 3.11 and 4.9. (The 5 Labs Study") http://enduse.lbl.gov/Projects/5Lab.html. More recent studies in the U.S. West and northeast have reached similar conclusions. See, e.g., http://www.swenergy.org/nml/New_Mother_Lode.pdf; and http://www.neep.org/files/Updated_Achievable_Potential_2005.pdf..

[5] Kushler, et al., *Five Years In: An Examination of the First Half-Decade of Public Benefits Energy Efficiency Policies*, 2004, American Council for an Energy-Efficient Economy.

[6] US Energy Information Administration, 2007. See the U.S. Energy Information retail electricity price website at http://www.eia.doe.gov/cneaf/electricity/epa/epat7p4.html.

[7] This is partly attributable to the fact that the IPCC's methodology includes electricity generation related GHG emissions in the end-use sectors rather than in the energy supply sector.

[8] McKinsey, *The New Energy Economy: Putting America on the Path to Solving Global Warming*, 2007.

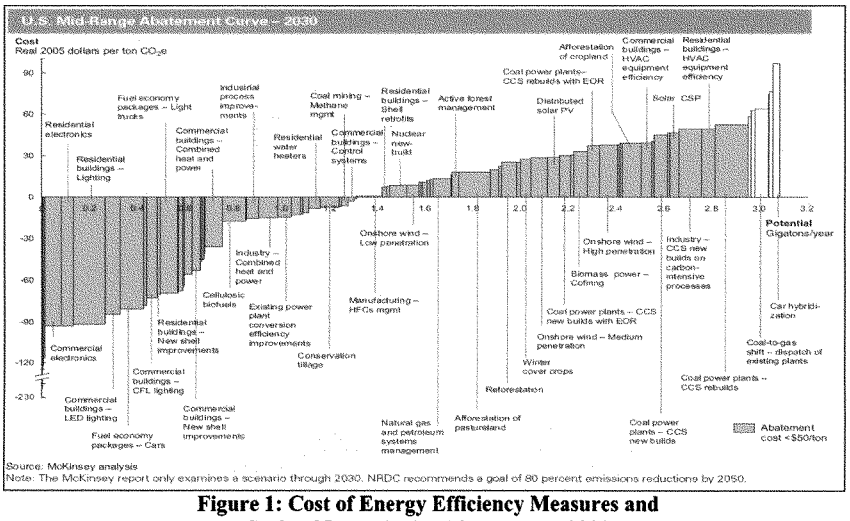


Figure 1: Cost of Energy Efficiency Measures and Scale of Potential in U.S. Through 2030

Figure 1 above ranks GHG reduction potential by cost, from left (greatest savings to implement) to right (most expensive to implement), with the size of the bars representing the scale of potential GHG reductions in each category of actions. The carbon reduction options on the left end of the graph are almost all energy efficiency technologies. These efficiency options show a negative net cost of CO_2 abatement, and account for almost half of the total emission reductions on the graph. Importantly, the net savings from the efficiency options offset the costs of the emission reductions on the right side of the graph – those with net positive costs. These efficiency technologies are thus essential to achieving an entire package of emissions reductions at low net costs to the economy.

In the U.S., as in most countries, analyses have shown that the efficiency potential has been tapped only in small measure.[9] These analyses, along with the recent IPCC and McKinsey analyses consistently show that efficiency is not only a large energy resource but also offers major opportunities for addressing the global warming problem. They generally show that aggressive efficiency investment, driven by policy commitments, can meet most or all of the projected growth in energy demand in the U.S., especially in the electricity sector, and that growth in GHG emissions can be arrested through accelerated energy efficiency technology deployment.

---

[9] Intergovernmental Panel on Climate Change, *Fourth Assessment Report, Working Group III Report*, 2007; UN Foundation, 2007; ORNL, 2000; Nadel, 2004. For a discussion of many of these points see Schiller, et al, *Energy Efficiency and Climate Change Mitigation Policy* (ACEEE 2008 in peer review).

One of the principal aims of cap-and-trade programs is to lower the overall societal cost of environmental improvement. Efficiency studies and two decades of utility DSM experience remind us that it will cost far less to avoid carbon emissions through energy efficiency than by adding or substituting expensive low-emissions generation on the grid. Thus it is entirely consistent with the overall goals of cap-and-trade to design a trading system that builds directly on efficiency as a resource.

Simply stated, a carbon program that directly mobilizes end-use efficiency will cost less and achieve more than one that focuses only on generators.

However, realizing these opportunities will take policy actions, including improvements in the allocation of carbon credits in any national cap-and-trade program.

II. Cap-and-Trade Basics: Why Cap-and-Trade Must Be Modified to Support Efficiency

There is pretty broad agreement among air experts that the U.S. Acid Rain program and the NOx trading and similar programs modeled on it have been a success – lowering emissions substantially at a lower cost than historic command and control systems.[10] The success of this model has led many decision-makers to conclude that carbon cap-and-trade programs should be built on the same basic structure. However, this does not mean that we should extend this model directly to carbon cap-and-trade systems. Among several crucial differences:

(a) First, carbon reduction programs are going to involve a lot more dollars, and will involve larger economic transfer payments over time, so flaws in architecture matter more.

(b) Second, energy markets are profoundly different today. When the Acid Rain program was designed, generators were part of vertically-integrated, rate-regulated companies. If they did not have to buy allowances, then consumers did not have to pay for them, since the generators were regulated on a cost-of-service basis. Today, US power markets are much more complex, and a large fraction of the power sold passes through wholesale markets that are not rate-regulated. As a result, cap-and-trade policies that might work well for consumers of vertically-integrated, rate-regulated utilities in about half of the nation, would confer windfall gains on generators and inequitable results for consumers in the other half.[11]

(c) Third, control options for carbon and for conventional pollutants are quite different. SOx and NOx reductions can usually be accomplished by generators at power stations

[10] See, e.g., http://www.whitehouse.gov/news/releases/2002/02/clearskies.html.

[11] Using the single-price auction rules now governing organized wholesale markets, all generators get the benefit of higher clearing prices, and all consumers have to pay (some immediately, some later when long-term contracts turn over). If fossil units setting the clearing price raise their bids due to the value of allowances they must use, costs will rise for consumers across all MWh sold in that market. These costs to consumers can be much higher than the actual cost of allowances to generators, especially if the allowances were awarded to emitters for free. See text accompanying notes 25-28 below.

through changes in fuel inputs (e.g., switching to low-sulfur coal) or plant modification, such as scrubbers. In contrast, as is often said, "there is no carbon scrubber" that can be added to a conventional power plant.[12] Real reductions in carbon intensity will come from *actions taken mostly by power buyers* – for example, substituting gas or renewables in the resource mix of a load-serving entity (LSE), or adding more efficiency and reducing consumption generally. These are actions that consumers – not fossil generators – will need to take and will have to pay for. It is widely understood that the Acid Rain program did almost nothing to promote end-use efficiency, but that a climate change program will have to do so to be effective.

For these reasons, it is increasingly apparent that national climate legislation will need to include design elements to avoid windfall gains to generators in states with competitive wholesale markets, to promote renewable power and other portfolio improvements among utility load-serving entities, and to deliver much more energy efficiency than we could expect from an Acid Rain-style cap-and-trade program alone.

III. Cap and Market Realities – Why Carbon Prices Alone Will Not Deliver Needed GHG Reductions in the Power Sector

Economists and policy-makers often assume that a carbon tax or its equivalent, such as an auction of pollution credits, will, at realistic prices, drive significant reductions in the carbon footprint of the electric power sector.[13] Those reductions are expected to come chiefly from two sources: demand reductions by consumers, and changes in the generation mix. In reality, it is very difficult to produce significant reductions in either location at carbon prices that governments can realistically expect to impose.

A. Carbon prices alone do not deliver an adequate consumer conservation response

First, on the demand side, it is difficult to inspire a conservation response among consumers that will deliver the socially-optimal level of investment in end-use efficiency. Cap-and-trade architects know that lowering carbon emissions from power plants will raise the cost of electricity and assume that those price increases will reduce consumption. Influenced by standard economic theory on internalized external costs, they often view increased power prices as *desirable*, and any resulting demand reductions as merely a *consequence* of the program. A better approach is to view *avoidable increased costs* as *undesirable*, and efficiency as an *integral component* of the cap-and-trade program.

Why? There are two related reasons. To begin with, there are numerous, well-documented **market barriers** to cost-effective efficiency investments, and those market barriers are not removed by carbon prices being applied to power generators -- they will continue to block

[12] Burning low-sulfur coal or scrubbing emissions of conventional pollutants do not materially alter the carbon content of the emission stream, while carbon capture and storage options are too costly to be realistic as add-on options for existing power plants.

[13] Or even the free allocation of credits under a cap-and-trade system. Most economists agree that once credits are made tradable through a cap and trade system, they will put upward pressure on power prices in wholesale markets regardless of whether they were initially sold to emitters or distributed for free.

needed improvements even after whatever rate increases could possibly be expected to flow from a carbon cap-and-trade program.[14] Builders don't pay the energy bills in the offices and homes they build. Consumers are confused by energy choices and apply very high discount rates to incremental costs for energy efficiency. Many homeowners don't expect to live in a home long enough to recover the savings from efficiency improvements, even though the investment may be cost-effective over the life of the structure. A new International Energy Agency study reports that up to 50% of residential energy use in the U.S. is affected by such barriers.[15] Even large industrial customers tend to under-invest in efficiency, and need technical and financial incentives to apply energy-saving solutions.

Moreover, whether due to market barriers or not, there is solid evidence extending over several decades that **demand for electricity in our modern economy is relatively inelastic**. Demand does respond somewhat to price, but the long-term reduction due to price increases is relatively small.[16] A 10% increase in power prices will, over 20 years, reduce demand by just 2.5% to 3%, which might offset the amount of load growth normally expected in less than 2 of those 20 years. It would take a much larger rate increase to offset expected load growth, much less to produce reductions in demand that could permit absolute reductions in emissions from the nation's huge generation fleet.

B. Carbon prices delivered to generators must be quite high to significantly alter generator dispatch --

The second problem with cap-and-trade designs that rely on carbon prices to alter power sector emissions is that, as a practical matter, given the make-up of the U.S. generation fleet, it takes a very high carbon price to materially alter the dispatch order, and thus emissions resulting from generation in the usual course of business. While this fact can be demonstrated through complex power models, the reasons are logical and straightforward.

- On a daily and hourly basis, power plants are dispatched largely in the order of their *marginal operating costs*, or in competitive wholesale markets, their bid prices, which are logically based on those marginal costs.
- Because they do not burn fossil fuels, power plants with the lowest GHG emissions (such as hydro stations and wind farms) tend to have low marginal costs and so are dispatched whenever they are available. Nuclear units are also dispatched whenever they are available. Thus, the existence of high carbon prices does little to cause these units to run more often.

---

[14] There is an extensive literature detailing these market barriers, including access to information, high first-cost problems, consumers' high discount rates, unpriced externalities, the landlord-tenant problem, and others.

[15] Prindle, et al., *Quantifying the Effects of Market Failures in the End-Use of Energy*, 2007, American Council for an Energy-Efficient Economy, final draft report to the International Energy Agency.

[16] The long-term price-elasticity of demand is approximately -0.25 to -.32. The U.S. DOE's National Energy Modeling System (NEMS) has price elasticities built into it. Their long run elasticities (assuming price effects remain for 20 years) are -0.31 for residential electric use and -0.25 for commercial electric use (see http://www.eia.doe.gov/oiaf/issues/building_sector.html).

- Carbon prices will force modest improvements in the performance of fossil plants, and some efficient plants will displace less efficient plants in the dispatch order. However, these impacts are small in GHG terms. To greatly improve the emissions profile of the existing U.S. power fleet, it will be necessary for lower-emitting gas units to displace higher-emitting oil and coal units in the dispatch.
- Since carbon taxes and allowance auction prices affect all fossil units to some degree, carbon prices drive up the cost of gas as well as coal, and it takes a relatively high price to cause the marginal price of coal generation to exceed the marginal price of gas generation.

Applying that high price across all generation can greatly raise the price of power, particularly if the total cost to consumers is measured on cost-per-ton of avoided GHG emissions.

This problem has been documented in a variety of studies. One report from the Electric Power Research Institute modeled the effect of various levels of carbon taxes or allowance prices in the Upper Midwest (which is highly dependent on coal) and in Texas (which relies heavily on gas). That study found that in the upper Midwest, a carbon charge of $25/ton would raise wholesale power prices $21/MWh, almost doubling the price, with little impact on emissions. "Even a CO2 value of $50/ton would produce only a 4% reduction in regional emissions given the current generation mix."[17] In Texas the problem is different but the result is similar. Since gas plants are at the margin already, high carbon prices raise the price of power with very little impact on overall emissions: "when gas is selling for around $8MMbtu, even a CO2 value of $40/ton produces little emissions reduction" from the existing mix.

C. There is good news however: Efficiency programs are more powerful than price increases or supply-side carbon prices

The existence of market barriers and inelastic demand does not mean that the efficiency resource is small, merely that it must be tapped through proven techniques that surmount market barriers. More than two decades of experience with utility DSM programs has demonstrated in practice that well-managed *efficiency programs* can deliver significant savings to the power grid, and thus can lower carbon emissions at low cost to the nation.

In fact, the power system will realize about 5 to 7 times more savings – in MWh, and thus in GHG emissions – from each dollar spent in a well-managed efficiency program, than it will through a generalized, across-the-board price increase.

The following example illustrates this reality. Using the generation, rates, and sales characteristics of a large U.S. Midwestern state, the example calculates the reductions in GHG emissions likely to result from two cases:

---

[17] Victor Niemeyer, (EPRI) *"The Change in Profit Climate: How will carbon-emissions policies affect the generation fleet?"* Public Utilities Fortnightly *May 2007.*

(a) Adding a 3% increase in prices, such as might result from a rate increase or a small increase in fuel prices due to an upstream carbon tax or auction price; and

(b) Taking the same 3% rate increase or carbon cost, but assuming that the revenue is invested in utility-sponsored or third-party energy efficiency programs at a cost of 3 cents/kWh.[18]

Due to the low price-elasticity of demand for electricity, the rate increase itself would result in a small decrease in demand and a corresponding reduction in emissions. If the proceeds from a system benefit charge or carbon credit auction are invested in programmatic energy efficiency, however, the savings are much greater, both in MWhs and in GHG reductions. In fact, investing the proceeds of a carbon charge in energy efficiency in this manner will increase the savings by a factor of 5x in the first decade (see Figure 2).[19] Extended over a longer time frame, the savings will grow to 7 times larger through intentional efficiency programs than through the price increase alone.[20]

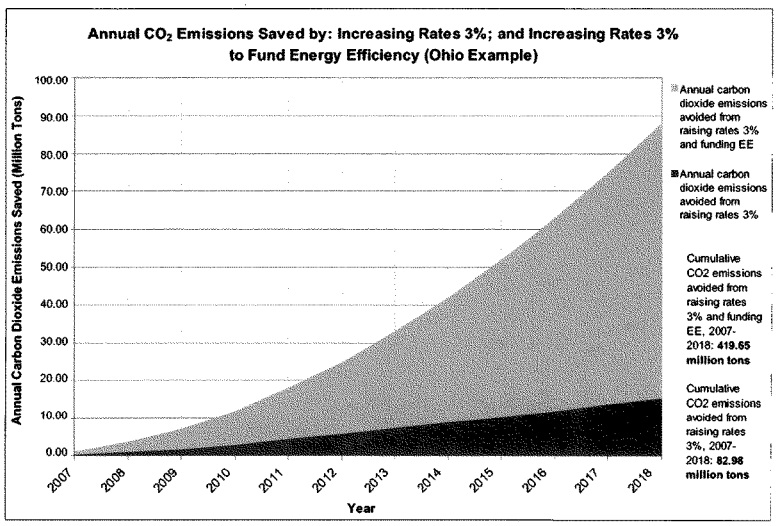


Figure 2: Efficiency programs save 5 times more carbon than carbon taxes or auction prices (for the same consumer cost)

[18] As noted earlier, many successful efficiency programs deliver significant savings at an average cost of under 3 cents per kWh saved.

[19] Raising rates without energy efficiency investment would save about 83 million tons of CO_2 between 2007-2018; raising rates with energy efficiency investment would save nearly 420 million tons.

[20] Over a 20-year period the ratio stabilizes at about 7:1. This is because some of the early efficiency measures are retired, and program funds are used to replace the savings they were delivering.

Conclusion: What this means for carbon programs is that for a given economic cost, society can reduce much more carbon pollution through *energy efficiency programs* than it can through *pollution programs* that focus only on the supply side and raise the price of electricity and only incidentally reduce demand.

IV. Cap-and-Trade Design Choices for Efficiency How can cap-and-trade architecture mobilize efficiency for carbon reduction?

A. Lessons From RGGI and the Northeast States: The Consumer Allocation

The Regional Greenhouse Gas Initiative (RGGI) is the leading effort in the United States to cap GHG emissions from the power sector. The RGGI region now extends to 10 states, stretching from Maine to Delaware.[21] The RGGI Memorandum of Understanding sets out the essential elements of a proposed Model Rule, which will need to be adopted by each state that will be part of the cap-and-trade region.[22] Rulemakings are now underway in most states, with implementation set to begin in 2009.

One of the signal achievements of the RGGI process has been the creation of a formal Consumer Allocation of carbon credits, rather than the automatic allocation of all credits to generators on the basis of their historic emissions.[23] This is a significant departure from previous cap-and-trade regimes; depending on how states implement this objective and the market price of allowances, it could substantially advance investments in energy efficiency in the RGGI region. A recent analysis by the RGGI state staff found that if 100% of RGGI allowances were auctioned in each state, per capita energy efficiency program spending could increase between 10% to 443% for each state (if allowances cost $2 per ton), or 15% to 664% (if allowances cost $3 per ton).[24]

(1) Two purposes for the Consumer Allocation: Recapturing Windfalls and Promoting Efficiency

Both experience and economic studies show that there can be a very large generator windfall from the wrong type of carbon allocation. Several studies on the free allocation of carbon allowances to generators have found the likelihood of substantial windfall gains to generators. One study prepared for RGGI estimated that total generator windfalls from 100% historic free

---

[21] Six states in New England, plus New York, New Jersey, Delaware, and Maryland are likely to enact implementing regulations by the end of 2008. Pennsylvania is officially an observer state, and unlikely to join RGGI soon.

[22] While styled as a "regional" effort, there is no regional governmental body with regulatory authority to implement RGGI. Individual states must enact their own regulations, simply agreeing to recognize carbon credit trading with credits from other states on a reciprocal basis.

[23] Regional Greenhouse Gas Initiative, Memorandum of Understanding, Section G (1) (December 2005).

[24] RGGI Staff Working Group, *Potential Emissions Leakage and the Regional Greenhouse Gas Initiative*, Final Report of the RGGI Emissions Leakage Multi-State Staff Working Group to the RGGI Agency Heads, March 2008).

allocation could total $1 billion or more annually.[25] More generally, the Congressional Budget Office found that for the nation as a whole "[p]roducers would have to receive only a modest portion of the allowances to offset their costs from a cap on carbon emissions..."[26] European governments that initially allocated allowances to generators on a free, historic basis are now having second thoughts, based on the early experiences of the European Union carbon trading system.[27]

The simplest way to solve these problems and reduce the unnecessary rate impacts of a generator-based cap is to award a large fraction of allowances in each compliance period to consumers, represented by their distribution companies or other supervised trustees acting on their behalf. By then selling these allowances in the credits market to generators, consumers' agents can recover through the credits market some of the generator windfalls that flow from the structure of today's wholesale power market. This revenue-recapture mechanism is essentially a market-based means of doing through program design what regulators historically would have done through cost-of-service ratemaking.

(2) Using the consumer allocation to support efficiency and lower the cost of carbon management

A large consumer allocation can lower the cost of the carbon reduction program to consumers by recapturing and recycling generator price increases for the benefit of consumers. But in what form should those benefits be returned to consumers? Some consumer advocates will naturally propose that revenues from the sale of carbon credits should be returned to consumers in the form of rate rebates. However, this will not produce the best long-term result for consumers.

The best outcome for consumers as a whole, and the best way to lower the overall cost of carbon reduction, is to invest carbon credit revenues in low-carbon resources serving consumers, especially low-cost energy efficiency measures.

There is good evidence for this conclusion. For example, modeling runs conducted by ACEEE for RGGI revealed that increasing the region's spending on energy efficiency was the key to lowering the overall cost of carbon reductions to the economy. That study found that doubling investments in energy efficiency throughout the RGGI region would lower projected load growth to 2020 by two-thirds, from about 20% above to about 6% above 2006 sales levels.[28] Efficiency also reduces carbon emissions, holding them roughly constant for an extended period (compared

---

[25] Dallas Burtraw et al, *Allocation of CO2 Emission Allowances in the Regional Greenhouse Gas Cap-and-Trade Program* Resources for the Future (December 24, 2004).

[26] Congressional Budget Office, *"Issues in the Design of a Cap-and-Trade Program for Carbon Emissions,"* Nov. 25, 2003. Others have found that generators would require as little as 13% of allowances to recover their compliance costs in a cap-and-trade program.

[27] E.g., "We also noted that the use of grandfathering as a means to allocate emissions permits is likely to result in substantial windfall profits for power generators throughout the EU." United Kingdom House of Commons, Environmental Audit Committee, "The International Challenge of Climate Change: UK Leadership in the G8 and EU" (March 2005 at p.17).

[28] William Prindle, et al, "Energy Efficiency's Role in a Carbon Cap-and-Trade System: Modeling Results from the Regional Greenhouse Gas Initiative" ACEEE (2006) at 2.

to a 15% rise in the base case) and thus greatly reducing the cost of attaining the reductions needed to meet RGGI's overall carbon objectives. The ACEEE study also concluded that doubling efficiency could avoid around 8,000 MW of new capacity additions, and would reduce the average household power bill by over $100 annually by 2020.[29]

Where additional investments are made in cost-effective efficiency measures, they will provide additional carbon reduction at the lowest cost to consumers and the economy. Selling carbon credits to emitters and then investing the revenues in low-cost efficiency provides greater benefit to consumers than a simple short-term rebate of the sales revenues. Recycling the credit revenues this way can lower the cost of carbon reduction to consumers and the economy and advance other goals, including lower power bills and greater reliability.[30]

(3) Consumer Allocation: Status

In December 2005, the Governors of 7 of the RGGI states signed the RGGI MOU, which includes a provision under which each RGGI state will propose to assign at least 25% of the state's carbon allowances to a consumer allocation.[31] Shortly thereafter, Vermont enacted legislation confirming Vermont's participation in RGGI and creating a 100% consumer allocation of carbon credits, and applying the value of carbon allowances entirely to energy efficiency. The legislation stated,

"In order to "provide the maximum long-term benefit to Vermont electric consumers, *particularly benefits that will result from accelerated and sustained investments in energy efficiency* and other low-cost, low-carbon power system investments...the public service board...*shall allocate 100 percent* of [Vermont's] tradable power sector carbon credits and the proceeds from the sale of those credits through allocation to one or more *trustees acting on behalf of consumers*."[32]

Vermont thus became the first jurisdiction to create a substantial consumer allocation of power sector carbon credits, and the first to use those credits to finance expanded investments in energy efficiency.[33]

Other states in the RGGI region are also allocating a significant percentage of allowance proceeds to energy efficiency. For example, in Connecticut at least 66% of allowance proceeds

---

[29] Ibid. at pp 2-4.

[30] The benefits will take several forms. Reduced consumption will lower power market clearing prices, producing an anti-windfall effect benefiting all consumers; it will lower power bills for consumers who install efficiency measures; it will lower demands on transmission facilities and improve reliability; and it will lower the cost of carbon reduction, ultimately making it possible to meet carbon reduction needs more quickly and at lower cost to the economy.

[31] Regional Greenhouse Gas Initiative, Memorandum of Understanding, Section G (1) (December 2005). There are now 10 signatory states.

[32] H.860 (2006) codified at 30 VSA S254 (c)(2). (emphasis added).

[33] In 2008, the Vermont legislature revisited this issue, confirmed the consumer allocation for efficiency, and directed that the credit value be used to support efficiency in buildings across all fuels on a "whole buildings" basis (S.209, 2008).

are expected to be invested in energy efficiency and conservation programs. In Maine, most allowance proceeds will be transferred to a consumer benefit account, with a portion targeted at combined heat and power at manufacturing facilities. Massachusetts DOER regulations express an intention to use the proceeds for energy efficiency, and additional legislation is pending. Currently, most states are in the process of codifying how allowances are used through proposed legislation and rulemaking proceedings. Between 90% and 100% of allowances currently are expected to be auctioned in each state. Some of the states are directing a percentage of allowances for certain set-asides or direct allocations, but these are transitional and are expected to phase out over time. In every state that is in the more advanced stages of its decision-making, energy efficiency is the primary activity for RGGI allowance proceeds.

B. Creating a Performance-Based Efficiency Allocation in National Climate Legislation

A number of observations can be drawn from the experience of power sector efficiency programs, from the history of air quality programs, and from the efforts underway in the RGGI and Western states to design state and regional cap-and-trade programs. Building on those experiences, if Congress enacts cap-and-trade legislation, it should create a national, performance-based **Carbon Allocation for Efficiency**[34] with a significant fraction of carbon allowances. The purpose of this allocation is to advance the national interest by encouraging states and utilities to accelerate the delivery of energy efficiency services to families and businesses in their states. Accelerated investments in efficiency, as shown above, will:

- Reduce power sector GHG emissions at lower cost than other options;
- Lower bills for consumers and offset other energy cost increases due to world market forces and other aspects of climate change legislation;
- Lower price pressure on carbon allowances, providing a cost containment benefit to the entire climate program;
- Reduce demand growth on power grids, improving reliability and reducing the need for expensive and economically riskier generation and transmission investments; and
- Improve the nation's energy security by reducing demand for imported energy.

Under this proposal, a significant fraction of allowances created in a national cap-and-trade system would be allocated annually to states (and/or local electric and gas utilities) in order to promote and reward the multitude of state and local actions that are necessary to deliver greater energy efficiency in millions of customer locations and communities across the nation.

The **Efficiency Allocation** should be performance-based. At first, allowances could be allocated to every state on a common formula, based upon population and historic energy consumption.

[34] A brief description can be found at *Carbon Allocation for Efficiency: A performance-based distribution of carbon allowances to reduce CO2 emissions and lower the cost of cap-and-trade* (Richard Cowart, RAP, and Steve Nadel, ACEEE (March 2008) posted at www.raponline.org).

However, over an initial ramp-up period of 4 to 5 years, allowances should be distributed to states to reflect their rate of improvement in efficiency, according to standard measures established by the national program administrator. Each state's annual allocation would be based on demonstrated improvement against *that state's own historic baseline*, providing an even-handed way to encourage greater efficiency in each jurisdiction. It does not favor today's leading states, nor does it grandfather a high level of emissions allocations to today's high-emitting states. Recent actions can be rewarded through selection of the baseline years.

While the focus in this testimony is on the power sector, there could be separate allocations (or measurements) for improved efficiency in the utility sectors, in buildings, and in transportation. Improving energy efficiency is the least-cost method for attaining national emission reductions, but most of the work has to be done locally and through state policies. A large fraction of allowances (30% or more) could be distributed to states to encourage aggressive state action.

The national program would not need to dictate methods or means of achieving efficiency goals – states, local governments, utilities, and third parties should be free to use a variety of techniques, and to experiment. Thus, codes, standards, incentives, utility programs, ratemaking, smart growth policies, competitive acquisition, etc. can all be supported without the need for national rules or standards for today's preferred techniques.

With respect to the use of allowance values, national legislation could either establish eligible categories of expenditures or categories of recipients, or leave distributional questions to the states. If distribution among the states is performance-based, and based on the right criteria, then national objectives are being met regardless of how states distribute allowances or spend the revenue.

V. Conclusions

National climate change legislation faces the daunting challenge of setting a path to achieve deep reductions in GHG emissions, while moderating economic costs and dislocations from the program. **Greatly enhanced end-use energy efficiency is clearly critical to achieving both of these goals, and national climate legislation should be designed to capture those resources, either through direct federal actions or by providing incentives to states, utilities, and other service providers.** Policy-makers and program designers should take account of the following lessons in crafting carbon cap-and-trade and other national climate legislation:

- A carbon program that directly mobilizes end-use efficiency will cost less and achieve more than one that focuses only on generators.
- Portfolio management policies such as renewable standards, environmental dispatch, and Efficiency Power Plants will provide most carbon savings and lower the cost of any power sector cap-and-trade system.
- Free allocation of carbon credits to generators based on historic emissions can lead to substantial windfall gains to generators with only small reductions in GHG emissions.

- Merely increasing the price of fossil power through carbon taxes or credit auctions will not reduce demand very much, and will thus be an expensive path to GHG reductions.
- An auction of emissions allowances, with revenues devoted to energy efficiency, is a positive way to use the "polluter pays" principle and to fund low-cost GHG reductions at the same time.

Addendum
Richard Cowart -- Director, Regulatory Assistance Project

Richard Cowart is a Director of The Regulatory Assistance Project, a nonprofit institute that has advised governments in more than 40 US states and 16 other nations on energy and environmental policy issues.

One of the nation's most experienced regulatory commissioners, Richard served as Commissioner and Chair of the Vermont Public Service Board (PSB) for thirteen years under three Governors (1986-1999). He was elected President of the New England Conference of Public Utility Commissioners, and Chair of the National Association of Regulatory Utility Commissioners (NARUC) Committee on Energy Resources and the Environment.

For the past three years, he has been deeply involved in the design of GHG-focused strategies for the power and natural gas sectors as a technical and policy advisor to each of the state and regional cap-and-trade initiatives launched in the US to date: the Regional Greenhouse Gas Initiative (RGGI), the Oregon Carbon Allocation Task Force, the California PUC and CEC's dockets to implement AB32, and the Western Climate Initiative. He has also worked with officials at the national, provincial, and local levels in China through the China Sustainable Energy Project.

Before his appointment to the Vermont PSB, Mr. Cowart was Assistant Professor and Director of the program in Planning and Law at the University of California, Berkeley (1980-85), and Executive Officer and General Counsel of the Vermont Environmental Board (1978-80). He received his B.A. from Davidson College, and the J.D. and Master of City Planning degree with honors from the University of California, Berkeley.

He received the Walton Award for outstanding public service to the State of Vermont (1996), the State Leadership Award, for "National Leadership in Renewable Energy," American Wind Energy Association (1997), NARUC's Kilmarx Award for national contributions on efficiency and renewable energy (2004), and the Conservation Law Foundation's highest award, the John H. Chafee Award for Environmental Leadership (2006).

Richard and his family live in Calais, Vermont, where they manage one of central Vermont's oldest Christmas tree farms.

<RHC short bio 4-08>

The CHAIRMAN. Again, I apologize to you.

While you were testifying, three more votes were called out on the House floor, and while we were out there on the floor for those last series of votes, Senator Obama came out on to the House floor, which created a little bit of a delay in the operation of the House floor. Again, I apologize to you.

I have time for one question right now, and then we will have to recess and come back again. Logistically this is going to be a very difficult day. That is all I can tell you.

I will tell you what I have to do. I think it is better right now if we take another recess, and we will reconvene as soon as these roll calls have been called.

[Recess.]

The CHAIRMAN. Well, the hearing is reconvened. And again, I apologize to our witnesses. And hopefully we will get a little bit of a break right now.

Let me ask of all of our witnesses, if Congress were to use emission allowances or auction revenues under a cap auction and trade program to promote efficiency measures, would it be better to channel allowances or funds through the States or directly to the utilities? Mr. Sakellaris.

Mr. SAKELLARIS. As I indicated in my testimony, I thought that it might be best for the Federal Government to set up a program and administer the distribution of those funds. But if I were to choose, though, between the States or the utilities, I would probably go with a State route.

The CHAIRMAN. With the States. Mr. Cowart.

Mr. COWART. As I said in my statement, I think there should be a large performance-based allocation to States. And the method of distribution has to be carefully managed, frankly, because we really do want to see the funds spent on investments in energy efficiency.

The CHAIRMAN. States or utilities?

Mr. COWART. I am saying States or load-serving entities or other consumer trustees appointed by States.

The CHAIRMAN. Okay. Mr. Kline.

Mr. KLINE. I would say load-serving entities under the direction and supervision of the State bodies.

The CHAIRMAN. Ms. Grueneich.

Ms. GRUENEICH. I would say either the State or the utilities load-serving entities under the supervision of the State.

The CHAIRMAN. Mr. DeCotis.

Mr. DECOTIS. Yes. I would recommend that the funding be provided directly to the States to ensure proper oversight, and they can use their discretion to appropriate portions of the funding to the utilities.

The CHAIRMAN. What is the risk that allowances or funds sent to the States for efficiency measures would get tied up in the State appropriations process? Mr. Cowart.

Mr. COWART. I think there is a great risk. I say this as a former State official. And that is the reason why I think crafting this carefully is important, number one. Number two, I believe the allocation should be performance-based so that the States are confronted

constantly with the reality that if they siphon the money off for other purposes, then next year's allocation is going to be affected.

The CHAIRMAN. Mr. Sakellaris.

Mr. SAKELLARIS. I like that idea, if it is performance-based, then they have an incentive to make sure that the money goes directly to the three projects.

The CHAIRMAN. And in that way, the appropriations process and the State legislature can't control it?

Mr. SAKELLARIS. That is why the Federal Government somehow has to be involved in order to make sure that they do not get involved, yes.

The CHAIRMAN. I see. Mr. Kline.

Mr. KLINE. I think I would favor the Public Service Commissions or Public Utilities Commissions, simply because I think they are one step removed from the budget discussions that occur at State levels.

The CHAIRMAN. Ms. Grueneich.

Ms. GRUENEICH. We certainly would be happy to accept the money. I would say—I would require at least two prerequisites for the State, whoever it is, or the utilities to get the money. The first is that the State itself on some level—and it could be decided who it is, whether it is Public Service Commission or the State Energy Office or the Governor—but that there is an actual plan that the State has not just for spending the money that year, but a longer-term strategic plan on where they are moving with energy efficiency.

And then the second requirement that I would have is that there is some program with some confidence for measuring and verifying that you are actually getting the savings in energy efficiency. I am a State. We love to get money. But if we are really going to get energy efficiency, we want it to be successful, and I think those two are required.

The CHAIRMAN. Mr. DeCotis.

Mr. DECOTIS. I would agree with both of those conditions, and add further that I think that the risk of misappropriating the funds is less now than it might have been in the past. And I think that is because the ground swell support for efficiency and for investments in clean energy technology is at a precipice that it has never been at before, and I think the public would just not allow it.

The CHAIRMAN. That is absolutely not accurate. All the tobacco awards that went to the States, the States just use it as a big piggy-bank and they essentially wind up not actually spending the money on prevention, which it is supposed to, targeting children so that they don't get into it.

Now, who doesn't want to stop children from smoking? Everybody. The public would demand it, except all this money gets looted so it gets drained down to a shadow of what it is. And that would be one of the concerns that is obviously, analogously, with energy efficiency renewables, et cetera. You have to be realistic in terms of the safeguards you put into place. And I would say that in both instances it is kind of dealing with prevention, you know, it is something that—there is no trophy on the wall. It is stuff that never happens because you were smart, you know, kid doesn't smoke, energy is not consumed. It is hard to build a big

groundswell around it, as you can tell from the size of the audience at this hearing.

So if this was on the future of nuclear power, which is only going to be 1/1,000 role of this, the room would be packed and people would be hanging from the chandeliers. So politically, realistically, you know, we just have to deal with that.

So let me now turn and recognize the gentleman from California, Mr. McNerney, for a round of questions.

Mr. MCNERNEY. Thank you, Mr. Chairman. First of all, I want to say, prior to what I ask questions on, since I missed the testimony, I hope I don't ask questions that have already been answered. And if I do, please show a little patience.

My underlying question here is, how quickly can we scale back fossil fuel consumption and CO_2 emissions with efficiency measures? One of the ways to measure that would be if we could offset the rising costs of energy by implementing efficiency standards or implementing efficiency measures in our State. And I would like to know if anyone thinks that that is possible, starting with Ms. Grueneich from my home State of California.

Ms. GRUENEICH. It is possible. The great thing about energy efficiency is we have the technologies, we have the knowledge. This is not an R&D program that we are going to get the results 5, 10 years from now. I just returned from a trip to China last month on energy efficiency. And China is very interested in energy efficiency, and they are ramping up very quickly at the provincial level to do it. It is a matter of thinking it through, making sure that you have got, you know, it set up in a way that you are delivering it. But energy efficiency, once I believe there is the policy, the leadership, and the funding, you can get programs ramped up very quickly.

Mr. MCNERNEY. Anyone else care to take a stab? Mr. Sakellaris?

Mr. SAKELLARIS. Based on the experience that we have, I think you can do about 1 on the low end side to 2 percent of the annual consumption. Right now I would say in the United States, we are probably reducing the demand by maybe a quarter to a half a percentage point. So if we get a little bit serious about this and get the Federal and the State governments behind it with taking some of the money back to the consumer, I think we can get up to 1 to 2 percent of annual consumption. That is why in my testimony I have said that we establish a target of 1.6 percent per year.

Mr. MCNERNEY. Per year.

Mr. SAKELLARIS. By year 2020, we will be at 20 percent reduction of the energy consumed in the United States.

Mr. MCNERNEY. And that is the entire spectrum of energy consumed.

Mr. SAKELLARIS. Correct. And there will be some cases—for example, if you take some of the housing infrastructure, et cetera, that you will save as much as 30 percent. But there are some other sectors that you will save only 10 percent. But the aggregate, based on the experience we have, you can achieve 1 to 2 percent annual reduction of the energy consumption.

Mr. MCNERNEY. So where do you see the sort of low-hanging fruit? Is that with utility production of energy or automobiles? Where do you see the easiest——

Mr. SAKELLARIS. I think it is with the end users. The residential sector has tremendous, tremendous potential for energy savings where you can reduce the consumption by 30 to 40 percent.

Mr. MCNERNEY. But that is going to require subsidies or some sort of government intervention, isn't it?

Mr. SAKELLARIS. Not that many. You buy back the projects from a 7-year project down to a simple 5-year payback. In the industrial sector, tremendous potential for energy savings, as much as 30-percent. And then you have the commercial, the industrial, the institutional sector. The Federal Government, for example, tremendous potential. In each and every facility we go, we save 30 to 40 percent. If I take 1 minute, we were in Elmendorf Air Force Base. We invested in a $50 million project and we did a complete energy savings retrofit. We estimated we will save them 30 percent. The project is up and running for the last 3 years, and we have saved them over 40 percent of the energy savings. So there is tremendous potential on the institutional sector for energy savings. So it can happen.

Mr. MCNERNEY. Well, one of the things that I have been hearing and I understand to be true, is that the buildings produce more than 50 percent of our Nation's greenhouse gases. Where is the majority of that energy coming from? Is that to heat and HVAC, or is it building materials or where does that energy go?

Mr. SAKELLARIS. A substantial amount in on the heating, ventilating and air conditioning. But even though, if you took the light and retrofit alone in the United States, if you go from the incandescents to florescents, they say it is as much as $10 to $15 billion investment a year. And that is less than a simple 1-year payback. So just that conservation measured alone——

Mr. MCNERNEY. So that is going to take a substantial—I mean, realistically to get building owners, including homeowners, to get invested in this, they are going to have to have some incentive.

Mr. SAKELLARIS. That is correct. And that is why we say some of this money goes back into the States or whichever administrative body has control, and simply buy back the paybacks.

Mr. MCNERNEY. Yes, Mr. Kline.

Mr. KLINE. Congressman, that is the way we structure programs in California where basically the utility designs programs. We have about 85 separate programs that are designed to do exactly what you described, to pay down the cost of some of these investments, facilitate a faster payback and to get over some first-time hurdles.

For example, a lot of commercial buildings are built by people who are just going to flip them and not own them or who won't pay the HVAC costs because those are charged to the tenants. So tying to get—as those buildings are built, get them built to high standards of energy efficiency means that you know you are going to have a higher comfort level and you are also going to have a much cheaper, better building.

Mr. MCNERNEY. Do you see any opportunity with leads to create a tax incentive for building efficiency? Mr. DeCotis?

Mr. DECOTIS. Yes. We have a tax incentive in New York for lead-certified buildings. And it has been very effective. I would like to add also that I would concur that I think electric and gas efficiency programs could save on the order of at least a half to 1 ½ percent

per year. I also believe—I believe this is the experience in California, and I know it is in New York because we have been offering efficiency programs for nearly 3 decades now. There is an industry that has been developed that is poised and ready and waiting to take on a competitive market for energy efficiency. And it is really quite a robust market. It is disparate in different States, but I have seen the industry grown from infancy to what it is today. And it is quite a robust market.

Mr. MCNERNEY. Am I imposing on my time, Mr. Chairman?

The CHAIRMAN. I wouldn't use the word "imposing." You have exceeded your time. With the brilliance of your questions, I would not allow the word "imposition" to be used.

But if you don't mind, perhaps your time could expire right now. I will ask some questions.

Mr. MCNERNEY. I will yield.

The CHAIRMAN. And come right back to you again.

Mr. MCNERNEY. Great.

The CHAIRMAN. And by the way, the gentleman from California actually founded a renewables company out in California. So he has got some background in it as well.

Let me go to you quickly, Mr. Sakellaris. You said that we consume in the United States the equivalent of 47 million barrels of oil a day; is that correct?

Mr. SAKELLARIS. That is correct.

The CHAIRMAN. So 21 million barrels of the 47 million is oil.

Mr. SAKELLARIS. That is correct.

The CHAIRMAN. Approximately 10 million would be coal, about 10 million would be natural gas. Is that basically in the ballpark?

Mr. SAKELLARIS. Correct.

The CHAIRMAN. So that is about 41 million of the 47 million. And then the remainder in equivalence of oil would be nuclear power——

Mr. SAKELLARIS. It is others.

The CHAIRMAN. Hydropower, solar, whatever, the smaller sources; is that correct?

Mr. SAKELLARIS. That is correct.

The CHAIRMAN. So as you are breaking down the 47 million, including where it goes in the transportation sector, the building sector, you know, commercial, industrial and home, where do you see the biggest potential gains? That is, out of the 47 million barrels of oil equivalent, which one of those categories is where the biggest gains can be reached and which is the smallest?

Mr. SAKELLARIS. I think the fastest one, it will be the residential sector followed by the industrial sector.

The CHAIRMAN. Okay. And what can happen in the residential sector?

Mr. SAKELLARIS. Changing out the lightbulbs, changing out the heating ventilating, air conditioning.

The CHAIRMAN. Of the 47 million barrels of oil equivalent, how much of that is in the residential sector?

Mr. SAKELLARIS. It is about 20 percent.

The CHAIRMAN. So about—you are saying about 11 million? Well, no, about 10 million.

Mr. SAKELLARIS. About 10.

The CHAIRMAN. About 10 million. And in that sector of 10 million in the residential sector, you think that you can reduce it down to 8 million?

Mr. SAKELLARIS. That is correct. And probably—actually, I think it is a little bit higher. It is somewhere between 20 to 30 percent of the residential sector.

The CHAIRMAN. So you think 2 to 3 million you think could be——

Mr. SAKELLARIS. I would say so.

The CHAIRMAN. And you said the total reduction could be 9 million that could be reached. So let's go to the next sector. In the industrial sector, how many millions of barrels of oil?

Mr. SAKELLARIS. Over 30 percent. Somewhere between 30 and 40 percent.

The CHAIRMAN. So another 2 to 3 million barrels a day?

Mr. SAKELLARIS. Uh-huh.

The CHAIRMAN. How about in the transportation sector?

Mr. SAKELLARIS. That is one of the soft numbers that we have in our analysis.

The CHAIRMAN. You say it is one of the soft numbers?

Mr. SAKELLARIS. Soft numbers, because how much mileage improvement we can get per car and so on?

The CHAIRMAN. Okay. So when my amendment was adopted and signed into law by the President——

Mr. SAKELLARIS. And that is the one, by the way, that we used to estimate what potential would come from that sector.

The CHAIRMAN. Your company used my amendment and its results in your company's analysis?

Mr. SAKELLARIS. We used some of——

The CHAIRMAN. What a great honor for me. Thank you. Thank you.

So when you factor in that by law now, the fuel economy standards have to go from 25 to 35 miles per gallon, how many barrels of oil does that save per day, do you——

Mr. SAKELLARIS. I don't recall right now the exact number.

The CHAIRMAN. The answer is 2 million. You can build that into your report. And you are saying—and the remaining couple of million barrels comes from everything else that we do in society, to get it up to 9 million?

Mr. SAKELLARIS. The rest of it is Federal Government buildings and some of the other institutional markets.

The CHAIRMAN. I see. Let me ask this:

We bring in all the good students. So you are all sitting down here. And we are all giving you gold stars today for the excellent work, which you are already doing. And we are trying to hold you up as an example to all of the States and all of the utilities, other companies that aren't quite meeting the same standards that you are right now, huh?

And so the first question is—well, I guess the most important question is, we really don't have to give you any more incentives. They are like the kids at Brown University that they don't even give exams to. You are just doing it. But a lot of people need exams just so they can do the work, they can study, they buy the textbook

like 2 days before the exam. But at least they know there is an exam coming up.

So there are many States, many utilities, that really aren't doing any of this in a significant way. So what do we have to do in order to get other States to adopt the policies that are existing in the States that we see here? What do we have to do about decoupling? What do we have to do—how do we create this dynamic whereby these other States and other utilities adopt the policies in New York, in Massachusetts, in California? We will begin with you, Mr. Cowart.

Mr. COWART. Well, I will just emphasize what I said in my opening testimony. I will make two points. The first is that if carbon legislation, climate change legislation enacted by Congress is going to—has the potential to cause significant price increases that we hope we can avoid by better design, that is the first part of the answer. So even——

The CHAIRMAN. What I am saying to you is, a lot of utility executives already know that, but they are still not doing it. So what do we do to them? Just get down to the answer. We know the problem. What do we have to do?

Mr. COWART. Well, I think we have to create a performance-based allocation of a significant fraction of carbon credits that would be available to every State and would be available to States in proportion to the degree to which they meet their own State's baseline. So Indiana isn't competing with California. Indiana, in order to earn allowances under a performance-based system, has to beat Indiana's past performance.

The CHAIRMAN. Okay. Mr. Sakellaris.

Mr. SAKELLARIS. Part of that might be the carrot and the stick-type of an approach, you know, if we have all this allowance money, how we send it back to the State, provided that they are doing something in energy efficiency. But if we press progressive commissions around the country, like California or New York or the State of Massachusetts, for example, that they promote energy efficiency projects, and then maybe take it down to the level with the utilities where we have incentives in the rate-based making and how will they earn back their—let's say the allowable rate of return is 8 percent. If they do energy efficiency projects, they get, say, 9 percent of an incentive rate of return. But if they don't, they get maybe 7 percent. But they have some kind of incentive on the rate making.

The CHAIRMAN. Okay. Mr. Kline.

Mr. KLINE. I agree with that. I think decoupling is critical—mandate, or bribe States to do it. Because if you don't accomplish that, then fundamentally you are not going to change the mindset of utilities. It is the first step, and then the second step, as my colleague has just stated, is to build in incentives in a performance based way that will encourage and create metrics that will allow you to judge whether it is happening.

The CHAIRMAN. So here we are, we are in California and New York, Massachusetts. People do it because they say, hey, we are going to make money. And then you are using the phrase bribe. I mean, it is in parenthesis for anyone that is watching. They don't really mean it. They are just talking about what kind of incentives

do we have to give to a State for them to figure out that it is in their interest anyway to move in this direction? So why do we have to do that?

Can you explain that, Mr. Kline, so we can just get your perception of what is it about these other States that don't move in this direction, that we have to figure out a way, quote-unquote, to bribe them to do what is in their best interest?

Mr. KLINE. I apologize for that poor choice of words.

The CHAIRMAN. That is okay. I have already explained it to the listening public that you don't mean it.

Mr. KLINE. If you think about a mindset of an industry that for over 100 years has made money by selling more, and all of a sudden you are coming to them and saying, we are going to flip this on its head——

The CHAIRMAN. I know what you are saying, Mr. Kline. But it is not 1968 anymore. It is 2008, you know? And why don't these—you know, California started in the seventies, Massachusetts, New York, Minnesota other States have already moved. What is holding these people back? Is it just the power of these local utilities and they don't want a change at all? Because they must obviously know that this is working for you. Why don't they move in that direction?

Mr. KLINE. I think, honestly, because many of them make a lot more money selling more.

The CHAIRMAN. Okay. But couldn't they make just as much money by selling less?

Mr. KLINE. Potentially.

The CHAIRMAN. Potentially.

Mr. KLINE. But not in the short term, probably.

The CHAIRMAN. Okay. Ms. Grueneich.

Ms. GRUENEICH. Let me just quickly—what you have just said. I was just at a National Governors Association meeting in Kansas City this week, talking with a number of utility executives. And, you know, they know if they can still—if it is still legal in the United States or in their State to build a conventional coal plant, and they can put it in the rate base, they will make a profit. And there are great uncertainties still. So they know they can get that coal plant in, they can make a profit. They know how to build coal plants. There is still great unfamiliarity with how to run energy efficiency programs on the scale of an equivalent of a power plant.

The CHAIRMAN. So in telecom law, everything just kept going along, never changed. And then we put price caps in. And all of a sudden, huh, you a saw a huge change in utilities across the country. They realized they had to start modernizing, right?

Ms. GRUENEICH. Yes.

The CHAIRMAN. So that is the equivalent here with decoupling. You have to find a way here of just changing the mindset legally so that they are forced in the same way price caps did it in—and so even a cap-and-trade system here is kind of the equivalent of the—once you set the cap, then all of a sudden new thinking has to occur.

Ms. GRUENEICH. And I think the challenge is, is that there isn't going to be one item that Congress can do in terms of here is one line in the bill that is going to get energy efficiency at the level we

need to have it. If we are going to deal with it, it is going to be a series of fairly complex different things to think through.

I mean, I would say in addition to everything else I have heard, a statement in whether it is another law on energy or in the climate change that literally does say energy efficiency is the number one top priority policy, or among them, that we are going to pursue in that sort of clear statement.

The CHAIRMAN. My time has expired. Let me turn back to Mr. McNerney and recognize him again.

Mr. MCNERNEY. Thank you, Mr. Chairman. And I feel like I neglected in my manners to thank the panel for coming, especially Mr. Kline from PG&E, which is my home district. In my home I use PG&E power and gas. So thank you for coming, all the Members, and for Commissioner Grueneich for coming today.

One of the things that excites me the most about global warming is the opportunity for us to create jobs and prosperity in our own country if we follow a sensible path. And Ms. Grueneich mentioned that I think in China—I think you were the one who mentioned it—you were there, and they are very excited about energy efficiency. Where do you think we are with regard to technology that we could export to China or other countries of the world, creating jobs here in this country vis-a-vis where they would be able to create industries that would take those jobs away from us? Mr. Sakellaris, could you take a stab at that?

Mr. SAKELLARIS. We have the intellectual capital in order to help them substantially. As a matter of fact, our company, we get at least once a month an invitation to a partnership with some Chinese company. They are looking for—I think we can—especially with the product where we finance the projects, because that is one of the products that we have where we finance the particular energy savings project, and then we guarantee that the savings will be there. And they are looking for help to see how we can do this project.

So we could create some jobs in the United States by promoting energy efficiency. Because in China when a per capita—on per unit of economic output, they use more than twice the energy that we are using. So the potential for them for energy efficiency is substantially more than us.

Mr. MCNERNEY. Yes, Mr. Cowart.

Mr. COWART. Well just speaking to the jobs question, I think there are an enormous number of jobs to be had by accelerating energy efficiency in the United States. Most of them will be jobs deploying energy efficiency in the United States as opposed to producing products that we will ship to the rest of the world. I just didn't want to overlook the fact that this is a very big potential area of job growth economy-wide, to implement all the measures that my colleagues here have been talking about.

Mr. MCNERNEY. Well, the hope is that we have technology we can ship overseas that would help them make their buildings more efficient or—but especially what I want to avoid is having them do the reverse to us.

Mr. COWART. Of course.

Mr. MCNERNEY. So we must have manufacturers or technology that is on this edge.

Mr. SAKELLARIS. We do have technology. But implementing energy efficiency in the United States for what we are talking about, the numbers earlier, will create between 3 to 5 million jobs per year anyway here, because most of those jobs, over 50 percent, it is labor. You need the electricians, you need mechanical contractors and so on besides the engineers and construction managers and the financiers. So the jobs will be created here.

Ms. GRUENEICH. Let me give you—again, I am going to—we can boast together about California, that some of the most exciting innovations in technology on energy efficiency, frankly, are happening in California.

I had the opportunity to do a tour of Silicon Valley about 6 weeks ago. And there is a company that is starting up making, for example, zero net-energy cement. They took the brightest of the brains and said, Here is what we are going to do. Here are the parameters. We want to have a product that has as close to zero net carbon emissions as possible. We want to have a product that performs as well or better in terms of quality. We want to have a product that, right out of the box, it is as cheap as what is the existing product on the market. And we want to have it scalable because we know we need to be using it throughout the world. They have been able to literally now develop a process that is close to zero net energy production for cement.

Another company is working on drywall that you put in the buildings. So we are really seeing—and these are also setting up some factories in California to produce the products. So I think it is another example of—we can be creating the jobs, and we can be creating the industry. And we in the United States have the opportunity to be the world leaders in doing this.

Mr. MCNERNEY. All right.

Mr. DECOTIS. Can I add to that briefly?

Mr. MCNERNEY. Sure.

Mr. DECOTIS. We have a green collar workforce training program in New York that is fairly well-funded in partnership with the colleges and universities in New York to train the next generation of worker in green energy technology and efficiency——

Mr. MCNERNEY. Is that focused on community colleges?

Mr. DECOTIS. Yes it is. It is. And it is growing in its recognition and its certification of employees. And we coupled that with a research and development program that New York runs which is developing and working with industry in New York to create that technology that they are then trained on. And as the technology is developed and we have workforce training and certification, we then deploy those technologies through our energy efficiency programs with exactly the point in mind that you made: That we need to be the State or we need to be the country that exports the technology. We don't want to be importing it.

Mr. MCNERNEY. Mr. Chairman, I have one more question. But I will defer to you at this point.

The CHAIRMAN. And I am going to in turn defer back to you so you can ask your question.

Mr. MCNERNEY. Okay. This one is for Mr. Kline. I have noticed with PG&E that the company is fairly receptive to energy efficiency measures which will reduce the need to put in new power plants.

And I think that is basically the business model, if you can avoid putting in new power plants, you are going to make more money in a sense. So how effective a message is that to other utilities to get them onboard with that? I mean it seems like ultimately if you give up all the power the energy supply needs, that you are going to be a distribution company and a transmission company rather than a generation company. Is that——

Mr. KLINE. I think you described the model correctly. With the addition that if we can avoid transmission, there is a financial benefit to customers there also. I think that there is a set of companies in the Edison Institute, which is the trade organization for the electric utility industry, has created a new Institute for Energy Efficiencies. So I think there is increasing interest in wanting to know more. I think that one of the issues you identified is that if companies extrapolate, and it means that they never build generation, then they don't want to shrink necessarily. So there needs to be a mechanism to assure that that doesn't happen. And part of it may be simply that there is enough customer growth and distribution, smart-grid kinds of additions to rate base that make that not a problem.

Mr. MCNERNEY. Is there a concern about competitiveness? If you continue this business model with neighboring utilities, it might offer communities an alternative to your business?

Mr. KLINE. I think it has been an issue in some cases where we compete for customers with irrigation districts, for example, who aren't under the same requirements and don't provide the same services. But on the whole, I would say it is not a big problem.

Mr. MCNERNEY. Thank you. With that, I yield back.

The CHAIRMAN. I thank the gentleman. And the gentleman's time has expired.

What I am going to do right now is ask each one of you to give us the 1 minute, 1 minute that you want to be on the record for eternity as we look back in history and they come to this hearing and they say, there, it was there in that 1 minute that those five people in their 1 minute summarized all you needed to know about the future, about energy efficiency, about economic growth, about saving the planet from catastrophic climate change. And they, they in their 1 minutes, explained how we can do it.

And we are going to go in reverse order. And you, Mr. Cowart, will have the first opportunity to give us your 1 minute on that.

Mr. COWART. All right. Well, thanks for the opportunity. And thank you for hosting this hearing.

Energy efficiency is the low-cost carbon scrubber and it is going to be the essential cornerstone of our Nation's climate strategy. It must be. And the Congress has to think about the ways to build energy efficiency attainment into any carbon program, including a cap-and-trade program, that Congress enacts. And that requires thinking creatively about what it takes to motivate the delivery of energy efficiency, which is different from the architecture that we have historically used for carbon cap-and-trade.

The CHAIRMAN. Thank you. Mr. Sakellaris.

Mr. SAKELLARIS. I will be very specific; 20 percent savings, 3.4 billion barrels of oil savings per year. Corresponding, 1.2 billion metric tons a year of emissions reductions, creation of 3 to 5 mil-

lion jobs per year, and we need the trade allowances to be auctioned. Thank you.

The CHAIRMAN. Thank you. Mr. Kline.

Mr. KLINE. I would start by referring folks to the supply curve that the McKinsey Global Institute put together for greenhouse gas abatement in the U.S. I think it is very instructive about what we can do today, what we can do at—in many cases, negative cost. To the extent that the Federal Government can start by putting building standards in place, minimum standards that States can rise above, I think that would be an amazing start because we continue to be building buildings that, for the life of the facility, are going to be drags on our efficiency and are much more expensive to retrofit.

The CHAIRMAN. Ms. Grueneich.

Ms. GRUENEICH. Two things. First the two-to-one rule. For every $1 you invest in energy efficiency, you are saving $2. You accelerate that up. In California $1 billion a year in energy efficiency. That is $10 billion over 10 years. We are saving $10 billion. That is going into California's economy. It is not going overseas at all. It is growing our economy. That is the message I think that wins.

Secondly, please act. Buildings are going up, appliances are being bought, and that just makes it more difficult to go back and fix things.

The CHAIRMAN. Thank you. And Mr. DeCotis.

Mr. DECOTIS. Yes. Thank you. And I would echo that in terms of taking action. I think if anything came out of this session today, it is that there is a need for leadership at the Federal level to bring the States together toward clean energy policy. And I think it is important to create what we call in New York an energy efficiency ethic so when people make decisions, purchase decisions, we could change the way they think, we could change the way they live, we could change the way they work, and we change the way they play, while working within private markets to create a profit potential for clean energy technology.

The CHAIRMAN. Thank you, Mr. DeCotis, very much. And we thank all of you for your testimony. Absolutely fascinating and central. This is the most exciting, least glamorous hearing that is going to be conducted in the Congress this year. But like many other nonglamorous subjects, herein lies the truth that will create the path to saving the planet and reducing dramatically the amount of energy.

And again, we turn to California for the formula. You know, back in 1962 the Beach Boys and Surf City. They had a two-for-one formula too. Which is at Surf City, there were two girls for every boy. And that to someone in a blue collar down in Malden, Massachusetts, that was a dream—California—that almost seemed too good to be true. And it turns out it was too good to be true. It never did exist there or anyplace else.

However, here the new two-for-one rule coming out of California and Massachusetts and out of New York, for every dollar you invest in energy efficiency, you get back two additional dollars. Kind of a miracle, huh? No, not a miracle. Just how my mother used to say, my mother used to say, Eddy, always try to work smarter, not harder. She would say that immediately, immediately before she

said, Eddy, I am donating your brain to Harvard Medical School as a completely unused human organ. And that was because I wasn't thinking smarter.

Now we have many utilities and many States whose brains collectively should be donated to Harvard Medical School because this is obviously the way to go. It is proven. It is a money maker. And yet people still resist it. Why? Because it is not the way they have done business in the past. And so this is a tremendous opportunity for us. We saw in the telecommunications revolution from the 1996 Telecommunications Act where not one single home had broadband, not one home in America, 1996. But once we got that policy right on the national level, we move to a point where now 11 years later, 12 years later, broadband is almost ubiquitous in its deployment. Companies like Amazon, Google, YouTube didn't even exist 3 years ago, but are only possible because we got the policy right, revolutionizing these issues.

And so that same kind of technological revolution is possible here in the energy sector as well. It is all there. As Mr. Kline said, the technologies are already there. They are ready to go. But we need the will and political policies put in place so that we unleash this revolution in a way that isn't just isolated to individual utilities, individual States; but that the United States is the leader, looking over its shoulder at number two and three and four and the world as we export these products, export these ideas all around the planet. And so that is what this hearing really represents to me. Because in a lot of ways, efficiency is the whole key to solving the problem of global warming, to reducing our energy dependence. And—and this is hard to believe—creating the new major economic driver in our whole society. The job creator. The way in which we kind of revolutionize the way in which we look at these issues.

Now, it was hard for the telephone companies to change. You know, AT&T had 1.2 million employees. We all still had our black rotary dial phone. Why would you want to change? It is working out great. Each one of you is renting for $3 a month every single month for your whole life a black rotary telephone. That is a good business, and the utilities, you know, loved it. And the regulators let them get away with it.

My mother paid $1,200 for renting it for 40 years, a black rotary dial phone. But no innovation, no new phones, no new devices, no Google, no Amazon, no YouTube. But yet you could always dial that phone, huh? Well, that is what we are still doing in energy, huh? That is what we are still doing. We are still relying on old ways of generating electricity.

So who would have thought that in the old days when you got on the phone and somebody called from another State, you know, your grandmother was calling in, they would hand around the phone saying, you have got to talk fast, it is long distance. Because it was going to be so expensive, huh? And AT&T made so much money on the long distance call.

Now you talk long distance like you are talking across the street because through new technology and new ways of looking at the issue, we have lowered the price dramatically. All that happened in one technological generation. We are going to be able to do the same thing here in energy efficiency. And it is going to become the

new source—the major engine for economic growth in the United States in the next generation. Millions of jobs, economic growth, export opportunities for us.

Your insights are valuable. We need to get you more allies in this fight. But I think ultimately the truth of your testimony will set the Congress free. And we will be able to pass the legislation before Copenhagen in December of 2009 that will make it possible for us to see this revolution in all of its full flower. We thank you for the leadership you have shown. This hearing is adjourned.

[Whereupon, at 1:13 p.m., the committee was adjourned.]

THE SELECT COMMITTEE ON
ENERGY INDEPENDENCE AND GLOBAL WARMING

Dear Mr. DeCotis,

Following your appearance in front of the Select Committee on Energy Independence and Global Warming, members of the committee submitted additional questions for your attention. I have attached the document with those questions to this email. Please respond at your earliest convenience, or within 2 weeks. Responses may be submitted in electronic form, at aliya.brodsky@mail.house.gov. Please call with any questions or concerns.

Thank you,
Ali Brodsky

Ali Brodsky
Chief Clerk
Select Committee on Energy Independence and Global Warming
(202)225-4012
Aliya.Brodsky@mail.house.gov

Responses to Questions of the Select Committee on Energy Independence and Global Warming

Paul A. DeCotis
Deputy Secretary for Energy
Office of the Governor, New York

1. How does the lifecycle of houses, electronic products, and other energy consuming goods shape the energy demand programs you seek to enforce?

Our energy efficiency goals are implemented through a portfolio of strategies that take into consideration the lifecycle and use of buildings and electronic and other consumer equipment. Our Department of State is promulgating the most recently available international model energy code for new construction, as well as appliance efficiency standards not currently within the U.S. Department of Energy's authority. The energy code and appliance efficiency standards set the base level for efficiency. State- and utility-sponsored incentive programs are then designed to encourage architects, engineers, and builders of new construction, and consumers and mid-stream market participants to achieve levels of efficiency higher than the minimum requirements of the

energy code or appliance standards. The net energy and dollar savings achieved by the programs are measured and verified, and assessed over the lifecycle of the efficiency measures that are installed. These monetized benefits are compared against life-cycle costs to determine the cost-effectiveness of programs.

2. Do you agree that energy efficiency gains have limits and in the long-term, energy demand is still going to increase and necessitate new sources of generation?

Yes. As aggressive energy efficiency measures become more common and set a new industry standard for energy use, consumers have been shown to change purchasing and energy use behaviors, becoming more energy conscious; and new technological breakthroughs are required to achieve additional efficiency gains. During this period of transition, energy efficiency gains might experience some short-term limits. In such a case, and as more stringent environmental regulations like the regional greenhouse gas initative (RGGI) in the northeast make fossil electricity generation more expensive, new cleaner and more efficient electricity generation will be required to meet the potential reduction in conventional generation and growing electricity demand. This said, it is well recognized and documented that there is tremendous potential for energy efficiency gains in the U.S. economy that, if achieved, would more than offset the growth in energy demand, even under high economic growth scenarios. In addition, as efficiency technologies evolve, new opportunities for increased energy efficiency emerge. This has been demonstrated through the U.S. DOE and state sponsored energy research and development programs – with new technological breakthroughs one again making additional efficiency gains available. Many power plants across the country are nearing the end of their useful life and will need to large infusions of capital to meet new source performance standards for criteria pollutant emissions, or be replaced in their entirety by modern efficient fossil generation, renewable energy, and other sources of generation. The country and states need a broad portfolio of energy and energy savings options for balancing the competing demands of meeting load, supporting energy and economic security and independence, economic development, and environmental goals. Energy efficiency is the lowest cost, most readily and easily available and cleanest energy alternative available today. The cheapest energy resource is the resource not used.

3. If efficiency improvements bring down the cost of operations for a power company, is there any reason that they wouldn't do it, without additional burdensome laws or regulations?

The answer to this question depends to a large extent on whether the "power company" referred to in the question is a vertically integrated utility company that owns electricity generation plants, or a "distribution" only company, with generation owned by independent power producers – in which case the power company is the generator. If the "power company" is a regulated utility, then the degree of efficiency pass through that gets reflected in customer rates is largely determined by the regulator. Any exercise in determining the overall impact of efficiency activities should assess all lifecycle benefits and costs to the energy system as a whole, not just on participants in energy efficiency programs, or utility shareholders. If the "power company" is a merchant generator selling energy into a wholesale market, the prices paid by the wholesale purchaser (utility) would reflect generator costs and the supply and demand balance in the marketplace. As demand falls due to efficiency gains, generators would be pressured to reduce their "bid" prices in order to "clear the market." Regulated "distribution only" utility companies are indifferent to efficiency as they only move power over their lines. The utility regulator has the ability to require distribution only companies to invest in energy efficiency on behalf of their customers while holding utility cost recovery and shareholder returns harmless. Finally, the laws and or regulations referred to in the question; need not be "burdensome." We have enough experience with efficiency investments and results over the past 30 years that any laws and regulations deemed necessary can be directional, inspirational, and profitable.

4. Do you think that businesses and residential consumers know what they pay in energy bills?

Yes. Electricity and natural gas bills in New York are sufficiently detailed for customers to understand the components of the bill. Bills show the quantity of energy consumed (and compare current monthly use to monthly use in the previous year), price per unit of energy, taxes, surcharges, and total energy cost per billing period. Retail electricity and efficiency service providers are also able to use this information to "shop" different electricity service packages to potential customers that might better met a customers needs. Having this information available instantaneously at the time of use through

smart metering and energy data readouts would further enhance their awareness of cost and would likely lead to greater efficiency and conservation. New York, like several other large states are pursuing investments in advanced metering and smart-grid technologies to improve customer demand response and provide additional profitable opportunities to businesses.

5. What education programs currently exist to teach consumers about energy savings? What effect has the Energy Star program had toward helping consumers make educated choices?

The New York State Energy Research and Development Authority (NYSERDA) administers New York's version of the federal ENERGY STAR program, which has proven to be enormously successful in providing consumers with energy use information of various products. New York was the first State Partner in the ENERGY STAR program. NYSERDA also administers hundreds of workshops each year and distributes brochures and literature to provide no-cost and low-cost energy savings tips to consumers. NYSERDA informs and trains retailers about the benefits of energy-efficient products to ensure efficient products are well described and more easily made available and sold to consumers. Overall, the federal ENERGY STAR program has proved useful and successful. The need exists, nonetheless, for the standards for all ENERGY STAR covered products (and homes) to be updated more regularly to reflect the program's success in increasing minimum efficiency levels so that state and federal incentive programs can push efficiency even higher.

6. Would you agree that "decoupling" is basically re-regulating the energy industry?

No. "Decoupling" is simply a regulatory scheme (mechanism) for ensuring that utility shareholder return targets are met, regardless of utility sales. The New York Public Service Commission requires utilities to file revenue decoupling mechanisms in all rate plans so that energy sales do not affect revenues. In this way, a utility is held harmless if sales are reduced through energy conservation and efficiency improvements. Energy restructuring in New York resulted in "deregulating" only the wholesale power market. Utilities are still regulated monopolies that manage the transmission and distribution systems and utility rates are still approved by state regulators. Decoupling does not apply to the wholesale power market. New York had decoupled sales from revenues in

the mid-1980's; moved away from decoupling in the mid-1990's; and is now once again using this regulatory mechanism to hold utility shareholder harmless regardless of sales, as the State implements it aggressive energy efficiency goal of a 15% reduction in electricity use by 2015.

7. Would you agree that tax incentives for energy efficient improvements would help on the demand side management?

Yes. Tax incentives can be useful tools to encourage consumers to buy energy efficient products and invest in energy efficiency technologies. However, it is important to design the tax incentive appropriately to ensure that it achieves the desired effect. A tax incentive that sets the eligible efficiency level too low could result in a significant level of "free riders" – people that would have purchased the product anyway, absent the tax incentive. Also, tax incentives need to be available for longer periods of time than currently available under federal law; companies and consumers need to plan long term purchase and investment decisions around the certainty and availability of tax incentives.

8. Mr. Skalleris says that 50% of proceeds from an auction of allowances in a cap-and-trade scheme should be dedicated to energy efficiency investments – is that a percentage that you all agree to?

New York has committed to dedicating 100 percent of its RGGI auction proceeds to investments in carbon mitigation strategies across all sectors, including transportation. This includes energy efficiency in buildings, industrial processes, appliances, products and emerging technologies, smart growth and regional planning, renewable energy development, and carbon capture and sequestration for advanced fossil generation technologies, to name a few. Fifty percent might be a useful minimum, but such decisions should be left up to the governmental entity requiring the cap and trade program, in this case, the states.

9. How much is the System Benefit Charge in New York? Is that charged to both commercial and residential consumers?

Currently, New York's System Benefits Charge (which is a surcharge on all customers of electric investor-owned utilities), collects $175 million per year. This funding is

administered by NYSERDA to deploy a range of energy efficiency programs. Recently, the Public Service Commission approved collecting an additional $172 million per year in new funding for efficiency which will be administered in part by NYSERDA and in part by the distribution utilities themselves. In addition to New York's investor-owned utilities, there New York has two public utilities that invest in energy efficiency. The New York Power Authority invests approximately $185 million annually in energy performance contracts for its governmental customers and schools, and the Long Island Power Authority has committed to providing $100 million per year beginning in 2009 for efficiency programs, up from $32 million annually over the past 10 years. In total, New York is investing over $700 million annually in energy efficiency, renewable energy, and technology research and development. It is expected that this amount will increase to $800 million to $1.0 billion within the coming year, to meet the State's 15 percent electric efficiency reduction goal by 2015, and the 25 percent renewable portfolio standard by 2013.

10. Since New York currently participates in the Regional Greenhouse Gas Initiative (RGGI) and you have energy efficiency programs, why do you need the federal government to implement either?

Climate change is a global problem and will require federal leadership to adequately address it. It is essential for the federal government to provide leadership and funding to states to implement more uniform and accountable programs to address a host of issues, including national economic and energy security, industrial policy and job growth in the clean-tech economy of the future, and climate change. As part of a federal industrial policy, federal support and investments in energy efficiency, renewable energy, and emerging technologies can provide the basis for the U.S. to reclaim its role as a world leader in the export of technology and intellectual capital to the rest of the world with the economic and job gains here in the U.S.

11. States can currently pursue whatever greenhouse gas reductions they want – wouldn't it be easier to just let that happen rather than creating a federal program and then creating a carve out for states to do more than whatever the federal program states?

No, it would not be easier to just "let it happen" rather than creating a federal program unless the federal government has little interest in ensuring consistency and

accountability among states, and little interest in leading the nation and world in addressing enormous energy, economic, and environmental challenges. States acting on their own – in part out of necessity due to federal inaction - cannot reduce total carbon dioxide emissions sufficiently to stabilize carbon dioxide (CO_2) concentrations in the atmosphere. Considering the effects of carbon emissions are global, the federal government should take leadership in this area to ensure that states which are committed to carbon emissions reductions are not unfairly penalized by taking early action. Nor should states with a higher carbon profile (high CO_2 emissions) be allowed to continue to recognize the economic benefits of higher carbon emissions (lower energy costs), while the costs associated with high CO_2 emission (climate change) are not fairly allocated. States acting early are put at a competitive disadvantage while high emitting states enjoy a competitive advantage at the expense of those states taking early action to address a national and global problem. Further, those states taking decisive action might be impacted by emissions from neighboring or upwind states taking no action, thus diminishing the benefit of the unilateral state program. Any federal program should create a floor of activity and allow states to take additional action, if such is desired by the citizens of that state.

Steven L. Kline
PG&E Corporation

Responses to follow-up questions from Legislative Hearing:
"Negawatts: The Role of Efficiency Policies in Climate Legislation"
Select Committee on Energy Independence and Global Warming
United States House of Representatives

1. **How does the lifecycle of houses, electronic products, and other energy consuming goods shape the energy demand programs you seek to enforce?**
   Response: The lifecycle of energy consuming products and buildings is critical to the calculations of many program components:
   - Cost-effectiveness of a product is calculated using energy and cost savings over the lifecycle of the product,
   - Calculations of program benefits for ratepayers include lifecycle of products purchased through the programs, and
   - Emission reductions are calculated over the lifecycle of the product/facility.

   Products/facilities with long lifecycles generally provide increased benefits to customers over similar products with shorter lifecycles.

2. **Do you agree that energy efficiency gains have limits and in the long-term, energy demand is still going to increase and necessitate new sources of generation?**
   Response: Energy efficiency offsets a percentage of the annual increase in energy load in California. Currently new generation will still be necessary. The amount of energy efficiency that can be achieved and the costs associated with that additional energy efficiency depends on a number of variables: What has already been achieved, what potential remains, the interest of customers to reduce their energy use and invest in efficient products, reductions in costs of energy efficient products, and additional, new products or technologies on the market. Over time, some energy efficient products will be required by codes or standards while others that are experimental now may be widely marketed in the future. Longer term, new designs and materials in new homes and businesses could reduce energy use even further. If these techniques can be inexpensively applied in existing

buildings, overall energy use could even fall. As a result, the percentage of energy demand that can be met by energy efficiency will continue to vary from year to year and the need for new power sources may vary by geography or market.

3. **If efficiency improvements bring down the cost of operations for a power company, is there any reason that they wouldn't do it, without additional burdensome laws or regulations?**

   Response: Utility economics do not always encourage energy efficiency programs. A utility typically has a fixed budget which must sometimes meet unanticipated needs (e.g., major storms). Since utility shareholders traditionally earn a return as the result of rate-basing new capital additions (revenue from sales provides the cash flow to pay expenses including these returns), short term management interest may focus business decisions on new capital investments rather than energy efficiency programs. As a decoupled utility, PG&E's circumstances are different, and our support for energy efficiency programs demonstrate our commitment to long term benefits for ratepayers as well as for the environment and the utility.

4. **Do you think that businesses and residential consumers know what they pay in energy bills?**

   Response: Residential and business customers are generally aware of the size of their energy bill. However, customers do not necessarily know how their bills are calculated. Items on the bill such as kilowatt hours, therms, generation and transmission charges as well as tiered rate structures are not well understood. Moreover, customers do not necessarily understand how their energy use behavior and the types of equipment and appliances they have installed in their homes or businesses correspond to the size of their bills. PG&E is looking at ways to simplify our current bill format and increase efforts to educate customers on how their energy use behavior impacts the size of their bills. In addition, with our roll-out of 10 million SmartMeters™ in our service territory, PG&E will establish two-way communication with our customers and time of use rate structures with the goal of providing customers real-time knowledge of power rates aimed at helping them make informed decisions around their energy consumption and conservation efforts.

5. **What education programs currently exist to teach consumers about energy savings? What effect has the Energy Star program had toward helping consumers make educated choices?**

   Response: PG&E offers a wide variety of education classes and services. Most focus on the architects, engineers, and contractors who provide design and installation services to consumers. PG&E's various energy centers also provide tools and consultations for specific projects or types of projects. (See www.pge.com/pec or www.pge.com/stockton) Energy Star is the national brand designed more specifically for consumers providing them with a way to easily identify and select more energy efficient appliances, saving them money and helping to protect the environment. As a national brand, Energy Star can sometimes have less savings impacts than more stringent state or local codes. While many consumers take a proactive role in purchasing these efficient products, specific educational marketing campaigns aimed at teaching the importance of energy efficiency must supplement the product marketing.

6. **Would you agree that "decoupling" is basically re-regulating the energy industry?**

   Response: I would not agree. While certain segments of the energy industry have had regulation reduced, particularly the marketing of energy from so-called "merchant" plants, most of the industry has seen changed regulation. "Decoupling" refers to one of those changes which can occur in one part of the industry, namely the energy distribution segment. Rather than add regulation, "decoupling" can simplify the distribution company's regulatory environment.

7. **Would you agree that tax incentives for energy efficient improvements would help on the demand side management?**

   Response: Yes, tax incentives can provide substantial help, and they are one of the basic tools the government can use to drive real behavioral and market change. However tax incentives are just one tool to address demand side management and must be supplemented by codes and standards, technology deployment such as smart meters which provide

important real-time information to aid consumer decisions on energy consumption, and regulatory support for decoupling, to name a few.

8. **Mr. Skalleris says that 50% of proceeds from an auction of allowances in a cap-and-trade scheme should be dedicated to energy efficiency investments – is that a percentage that you all agree to?**
Response: PG&E supports auctioning of emissions allowances under a cap-and-trade program with the value of those allowances provided primarily to the electric utility ratepayers who will be paying the compliance costs passed through to them by power suppliers. The optimal use of the proceeds to assist customers and utilities in reducing emissions can best be determined based on input from stakeholders which must include requirements for energy efficiency and demand response programs.

9. **I agree that the Energy Policy Act of 2005 was a great step in the right direction, and I note in your testimony that you are looking for a longer term extension of these provisions to 5 to 10 years. Given the energy needs of our country and the global warming debate, is there any reason not to permanently extend these policies?**
Response: While I did not address the Energy Policy Act of 2005 in my testimony, I do believe the legislation provided important energy efficiency provisions, notably tax credits critical to achieving further imbedded energy savings. While the duration and stability of policies such as tax credits are essential for the development and penetration of energy efficient products, the detail of the policy must be timely and relevant in order to achieve the most efficiency savings possible.

10. **I agree that tax policies can play a significant role in developing technologies. I wholeheartedly support the R&D tax credit. What other tax policies do you think are critical to support energy technology and deployment?**
Response: Specific to energy efficiency technology development and deployment, the recent passage of the tax credits in HR 1424 established an important start by adjusting the depreciation schedule for smart meters from 20 years to 10 years. We believe a further

reduction in the depreciation schedule will provide an essential incentive for more wide-spread deployment of this energy efficiency and demand response enabling technology.

11. **Did PG&E lobby for the California energy efficiency standards when they were implemented?**

Response: PG&E works with the California Energy Commission and others in advocating for enhanced energy efficiency standards and codes in California. PG&E provided Codes and Standards Enhancement Studies to support two thirds of the 2008 Title 24 code implementation. PG&E has supported the improvement of standards for over a decade at both the state and federal level.

12. **Does PG&E support "decoupling" of energy systems?**

Response: PG&E has been in a decoupled regulatory environment most of the last 25 years. Over this time, decoupling has been a key enabling policy that has helped California maintain a flat energy demand curve while the rest of the United States has seen demand over the same period grow by nearly 50 percent. As a decoupled utility, PG&E has a clear incentive to help its customers reduce their energy costs through broad deployment of energy efficiency programs. Decoupling continues to support both our business and environmental objectives.

13. **What kind of financial incentives do you think are most effective in the area of energy efficiency?**

Response: Energy efficiency goals can be achieved even more effectively if decoupling is combined with financial incentives that help motivate utilities to promote and embrace energy efficiency and put it on par with similar investment opportunities, such as building new generating facilities. California pioneered such incentives in the 1990's, and has recently adopted a system whereby utilities' shareholders can earn if the company delivers real energy savings to customers. In addition to properly aligning incentives for utilities, California has recognized the need for long-term commitment to energy efficiency and has established a consistent regulatory environment for the development and support of leading energy efficiency efforts. For example, California's current cycle for program

development and investment is three-years. By providing PG&E with a three-year energy savings target and the authority to fund these efforts over this time period, we are able to establish programs and measures, and engage with customers on some high-value efforts that have longer lead-times.

14. **Do you think that codes and standards should be set legislatively, by regulatory process or by industry best practices groups?**
Response: Codes and standards can be set through a regulatory process if that process provides a level playing field for all advocates. Legislation may still be needed even in a favorable regulatory situation. Best practices do not constitute a standard unless they are also part of a formal regulatory or legislative process to set standards.

15. **Besides declining sales and profits, what are the disincentives for utilities to pursue energy efficiency measures?**
Response: Disincentives for utilities to pursue energy efficiency programs mainly occur in the absence of "decoupling." Pursuing energy efficiency is a natural role for the customer's energy provider. With an established customer connection, and billing and service role, utilities are well positioned to help customers manage their energy costs.

PG&E Corporation.

Steven L. Kline
Vice President
Corporate Environmental &
Federal Affairs

900 7th Street, NW, Suite 950
Washington, DC 20001-3886

202 638 3517
Fax. 202 638 3526
steven.kline@pge-corp.com

October 10, 2008

Congressman Edward Markey
Chairman
House Select Committee on Energy Independence and Global Warming
Room B-243 Longworth House Office Building
Washington, DC 20515

Dear Congressman Markey:

Thank you again for providing PG&E Corporation with the opportunity to participate in the May 8, 2008 hearing of the Select Committee on Energy Independence and Global Warming, "Negawatts: The Role of Efficiency Policies in Climate Legislation." I commend the Committee for its leadership in addressing this important topic and for the continued commitment to and support for energy efficiency and climate policy you have demonstrated.

Enclosed please find response to the questions you posed to PG&E following the hearing for inclusion in the record.

Please do not hesitate to contact me or any of my colleagues for further assistance or clarification on the enclosed responses.

Sincerely,

Enclosure

U.S. Climate Action Partnership
Energy Efficiency and Buildings
Legislative Recommendations

June 8, 2007

The U.S. Climate Action Partnership (USCAP), a coalition of leading businesses and environmental organizations, released a set of legislative principles and recommendations for U.S. climate policy in January, 2007. USCAP recommends the prompt enactment of national legislation to slow, stop and reverse the growth of greenhouse gas emissions over the shortest amount of time reasonably achievable. Fundamental to this is a cap-and-trade that covers as much of the economy's greenhouse gas emissions as possible. In addition, USCAP recommended that Congress pursue complementary policies and measures aimed at developing and deploying low- and zero-emission technologies.

USCAP believes that one of the most immediate steps Congress can take to begin to address climate change is pursuing some of these complementary policies and measures as they pertain to improving the energy efficiency of the U.S. economy. Polices are needed to realize the full potential of energy efficiency as a high priority resource and a cost-effective means of reducing greenhouse gas emissions. USCAP provided a broad set of recommendations for achieving this in *A Call for Action*, including:

- Aligning financial and regulatory incentives with utilities' business interests to pursue energy efficiency;
- Developing and implementing stronger energy efficiency codes and standards for whole buildings and for equipment and appliances;
- Providing incentives and reforming tax policies to facilitate deployment of, and advance the infrastructure necessary to support, new "smart" and highly-efficient technologies and distributed generation; and
- Creating incentives to go beyond existing standards to produce additional energy savings.

As Congress moves to advance legislation that addresses energy efficiency, USCAP has developed more detailed recommendations for consideration. These recommendations include the following:

Recommendation 1 – Extension of Energy Efficiency Provisions: Congress approved a comprehensive set of energy efficiency provisions (including codes and standards, tax rebates and

incentives, education and outreach programs, and federal procurement) as part of the Energy Policy Act of 2005. Many of these provisions are slated to expire. *We recommend that, as a first step, the tax credits, incentives, and rebates included in these provisions be extended for, at a minimum, 5 years, and that the energy efficiency outreach and education programs be fully funded for 10 years.* Implementing this recommendation will allow for fuller deployment of energy-efficient technologies and practices and provide certainty to manufactures and utilities in terms of what products and services can be offered to customers and at what price.

Recommendation 2 – Codes and Standards: Codes and standards play an important role in advancing the development and deployment of energy-efficient technologies that will reduce energy use and, consequently, provide greenhouse gas benefits. Currently, DOE has pending before it rulemakings to establish codes and standards for end-use technologies, while others are in the queue. In addition, there are other end-use technologies for which increasing existing standards or establishing initial standards would provide significant benefit. There are also actions that the federal government can and should take to both improve the energy efficiency of its buildings and assist the states in developing and implementing building codes and standards. Finally, the U.S. should participate formally in international efforts to develop uniform codes and standards for end-use technologies. The following provides some additional specifics with regard to codes and standards:

Appliance and Equipment Standards

- Improve the DOE prioritization process to highlight products and end-use technologies for which efficiency standards have not been promulgated and that have the greatest potential for overall reduction in energy use and greenhouse gas emissions. DOE must, however, continue to meet statutory deadlines for appliances and equipment.
- Ensure that codes and standards being developed focus on the high-priority products.
- Ensure that codes and standards being developed are cost-effective by requiring DOE to apply cost-effectiveness criteria. DOE should use a carbon-adjusted price of energy when conducting these assessments.
- Improve upon standards for the following end-use technologies:
  - Residential boilers
  - Industrial motors
  - Industrial/commercial chillers and boilers
  - Electric distribution transformers
- Establish performance standards that will increase efficiency for all types of lighting.
- Establish energy efficiency standards for power supplies/transformers for consumer electronic equipment (e.g., "parasitic" or "vampire" loads).
- Ensure appliance and equipment standards are implemented and updated in a timely manner by:
  - (1) requiring DOE to complete rulemakings and establish new standards within the statutorily required schedule, and establish a "forcing function" to drive DOE to meet this schedule.
  - (2) for appliances and equipment for which there are mandatory standards, requiring that new standards be considered every 5 years or in accordance with statutory requirements and follow the rulemaking timeline and process outlined above.
- Increase DOE funding to support these efforts, and appropriate funds accordingly.

Buildings Standards and Efficiency Improvements

- Create an office of "green buildings" to develop and oversee implementation of uniform sustainable design standards and procurement policies for federal buildings.
- Require a 30% reduction in energy consumption at federal buildings, including those owned and leased, by the end of fiscal year 2015, relative to energy usage in fiscal year 2003. This program should focus on reducing energy use and energy procurement through energy efficiency and the deployment of combined heat and power (CHP) and distributed generation properties that provide a net greenhouse gas benefit for the facility.
- Create and fund education and outreach programs to assist state and local governments in establishing and implementing commercial building codes and standards for new commercial buildings.
- Provide grants/matching funds to states to pursue development and implementation of building codes and standards.
- Standardize installation requirements for zero- and low-greenhouse gas emitting customer-owned generation to facilitate more efficient and cost-effective deployment of these technologies.
- Revise mortgage qualification criteria established by federal mortgage programs to account for lower energy and transportation costs of owning energy-efficient and location-efficient homes.

Recommendation 3 – Tax Policies: Tax policies play a significant role in facilitating development and deployment of highly energy-efficient, end-use technologies. Policies should help to align incentives for energy consumers to make investments in energy-efficient products and processes, align incentives for manufacturers to develop and deploy these technologies, and facilitate turnover in capital stock to more quickly deploy advanced, energy-efficient technologies. These measures include:

- Provide expensing treatment to any major retrofit that meets or exceeds prescribed energy efficiency standards equivalent to standards for new commercial buildings, thereby accelerating the payback period.
- Accelerate depreciation schedule (e.g., 5-year schedule) for advanced meter technologies that facilitate two-way communication, can remotely adjust energy consumption, and are compatible with, or can be upgraded to facilitate, deployment of "smart" appliances and other "smart" end-use equipment.
- Reduce depreciation for distribution transformers (e.g., to 15 years) to provide incentives to more quickly retire existing transformers and replace them with those that meet the standards established in Recommendation 2.
- Accelerate depreciation schedules for new CHP and distributed generation properties that meet or exceed prescribed greenhouse performance standards.
- Establish investment tax credit for new CHP properties that meet or exceed prescribed greenhouse gas performance standards and non-emitting distributed generation properties and distributed generation properties that meet or exceed prescribed greenhouse gas performance standards.

Recommendation 4 – Measurement and Accounting Protocols for GHGs: Having transparent, complete and accurate evaluation, monitoring, and verification (EM&V) mechanisms for measuring energy reductions is essential for the success of energy efficiency. While significant work has been

done in this area, both at the state and federal level, it would be helpful for states to have a common platform for accounting that will also allow energy efficiency to better "roll-up" into a broader, national greenhouse gas cap-and-trade program. NAESB is working on a common platform for evaluating and monitoring savings from demand response, while many states, including California and New York, have robust EM&V programs for both demand response and energy efficiency. *DOE/EPA should collaborate and draw on these and other existing, rigorous efforts to develop a common protocol for measuring and accounting for energy reductions and calculating associated greenhouse gas benefits.*

Recommendation 5 -- Align Utility Incentives to Pursue and Promote Energy Efficiency: Many electric and natural gas utilities currently have a disincentive to pursue and promote aggressively energy-efficiency and demand response programs and other measures as a result of existing regulatory and ratemaking structures. In order to truly prioritize energy efficiency as a resource, removing these regulatory barriers is critical. *Congress should clearly state that energy efficiency is a priority resource and encourage the alignment of state regulations and ratemaking with the delivery of cost-effective energy-efficiency and demand management programs.*