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BUILDING GREEN, SAVING GREEN: CONSTRUCTING SUSTAINABLE AND ENERGY-EFFICIENT BUILDINGS

HEARING

BEFORE THE

SELECT COMMITTEE ON
ENERGY INDEPENDENCE
AND GLOBAL WARMING
HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

SECOND SESSION

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BUILDING GREEN, SAVING GREEN: CONSTRUCTING SUSTAINABLE AND ENERGY-EFFICIENT BUILDINGS

WEDNESDAY, MAY 14, 2008

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

The committee met, pursuant to call, at 2:03 p.m., in Room 2358A, Rayburn House Office Building, Hon. Edward J. Markey [chairman of the committee] presiding.

Present: Representatives Markey, Blumenauer, Inslee, Solis, Cleaver, Sensenbrenner, and Sullivan.

Staff Present: Joel Beauvais.

The CHAIRMAN. Welcome, ladies and gentlemen, to the Select Committee on Energy Independence and Global Warming.

Today's hearing is a most important hearing because it deals with an issue that most people aren't really aware of. Because if you ask most people what contributes up to one-half of U.S. greenhouse gas emissions, they will likely say automobiles, SUVs. But the truth is as plain as the wall that each of us faces right now: The building sector is responsible for up to 48 percent of our Nation's emissions. On a local level, buildings can account for an even higher percentage of emissions. Seventy-eight percent of Boston's heat-trapping gases are attributable to buildings.

Energy-efficient buildings must be part of a comprehensive fight against global warming. Efficient design, low-emission construction materials, and decreased energy use in buildings can combat global warming and simultaneously reduce the rising costs of lighting, heating and cooling structures.

Energy efficiency in buildings is only a starting point. A truly "green" building should help preserve natural resources. Water use should be minimized. Construction materials should be nontoxic and travel shorter distances. Appliances and furnishings should use less energy and fewer toxic chemical compounds. Most importantly, we must ensure that all buildings receive this treatment, whether they are new or already built, commercial or residential, public or private.

Though measures to improve building efficiency can cost an additional $1 to $5 per square foot, consumers could get a good return on their investment. The average green building can save 25 to 30 percent more energy than a traditional one. The overall economic and environmental benefits of more efficient buildings are clear.

However, the competing interests of the building sector can obscure the long-term benefits. A developer may have concerns about recovering the initial costs of green design or energy-efficient features. A commercial tenant may not want to pay for efficiency upgrades on a 5-year lease. A homeowner may not have the initial capital needed to improve home efficiency, or may not be planning to be in the house for another 10 years to get the full return on investment.

In a recent survey, only 7 percent of the public identified buildings as a major source of global warming emissions. Today, we hope to change that perception by discussing various approaches to improving building efficiency.

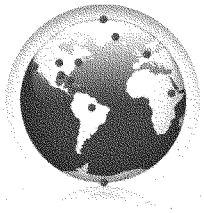
The witnesses are collectively utilizing innovative local approaches, materials, mandatory codes and voluntary guidelines to reduce this massive source of emissions. Mayor Newsom has sustained and implemented a myriad of green building initiatives, among other notable environmental efforts in San Francisco. The Engineering Society here today, whose mission is to advance energy-efficiency technology, they have developed building and energy codes used by local, State and Federal governments. And the U.S. Green Buildings Council has developed LEED, one of the most commonly used certification programs for a green building. Enterprise Community Partners now helps low-income housing, buildings with the tightest construction budgets, become sustainable in a cost-efficient manner. And we will also hear from Dryvit, a corporation working to improve the efficiency of buildings with what they call Outsulation.

As a final note, I would also add that three of you are actually seated, for a change, in environmentally friendly chairs. These chairs were built from recyclable materials, created using alternative energy, and can be nearly fully recycled as well.

We thank each of you for being here, and we look forward to your testimony.

Let me turn and recognize the ranking member of the committee, the gentleman from the State of Wisconsin, Mr. Sensenbrenner.

[The information follows:]



THE SELECT COMMITTEE ON
ENERGY INDEPENDENCE AND GLOBAL WARMING

Remarks of Edward Markey, Chair
Select Committee on Energy Independence and Global Warming
April 14, 2008 Hearing
Building Green, Saving Green: Constructing Sustainable and Energy-Efficient Buildings

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Ask most people what contributes up to half of U.S. greenhouse gas emissions, and they will likely say cars. But the truth is as plain as the walls that you face. The building sector is responsible for up to 48 percent of our nation's emissions. On a local level buildings can account for an even higher percentage of emissions: 78 percent of Boston's heat-trapping gases are attributed to buildings. Energy-efficient buildings must be part of a comprehensive fight against global warming.

Efficient design, low-emission construction materials, and decreased energy use in buildings can combat global warming and simultaneously reduce the rising costs of lighting, heating and cooling structures. Energy efficiency in buildings is only a starting point: a truly "green" building should help preserve natural resources. Water use should be minimized. Construction materials should be non-toxic and travel shorter distances. Appliances and furnishings should use less energy and fewer toxic chemical compounds. Most importantly, we must ensure that all buildings receive this treatment whether they are new or already built, commercial or residential, public or private.

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In a recent survey, only seven percent of the public identified buildings as a major source of global warming emissions. Today, we hope to change that perception by discussing various approaches to improving building efficiency. The witnesses are collectively utilizing innovative local approaches, materials, mandatory codes, and voluntary guidelines to reduce this massive source of emissions. Mayor Newsom has sustained and implemented a myriad of green building initiatives (among other

notable environmental efforts) in San Francisco. ASHRAE is an engineering society whose mission is to advance energy efficiency technology. They have developed building and energy codes used by local, state and federal governments. The U.S. Green Buildings Council has developed LEED, one of the most commonly used certification programs for a green building. Enterprise Community Partners helps low income housing—buildings with the tightest construction budgets—become sustainable in a cost-efficient manner. And we will also hear from Dryvit, a corporation working to improve the efficiency of buildings with what they call "outsulation".

As a final note I would like to add that three of you are actually seated for change in environmentally friendly chairs. These chairs were built from recyclable materials, created using alternative energy, and can be nearly fully recycled as well. Thank you for coming to testify on this important issue.

Mr. SENSENBRENNER. Thank you very much, Mr. Chairman.

Today's hearing on green buildings touches on many of the same issues the select committee examined during last week's hearing on energy efficiency. For the most part, policies that promote green buildings is simply policy to promote efficiency in building, construction, maintenance, and operations. There are several reasons to encourage more productive uses of energy. Improved efficiency gives us the ability to reduce greenhouse gas emissions in the near term without enacting punishing regulations that would cripple our economy.

According to the U.S. Green Building Council, buildings consume 40 percent of the energy used in the United States. That is more than both the industrial and transportation sectors. Buildings are responsible for 39 percent of CO_2 emissions and 71 percent of electricity consumption. As Tony Stall from Dryvit Systems will tell us today, 80 percent of the buildings constructed before 1960 are poorly insulated. Energy literally seeps through the walls of these buildings.

It is clear that increasing energy efficiency in buildings should be a high priority in our energy policy, but it shouldn't be just a Government priority. With the potential savings in cost that these energy savings would create, I think that many building owners would want to make these improvements.

Mr. Stall says in his testimony that his company's insulation product will help lower annual energy costs by 10 to 20 percent. The Green Building Council says that energy-efficient buildings could generate up to a 9 percent decrease in operating costs, a nearly 8 percent increase in building values, and a more than 6 percent increase in return on investment. Who wouldn't want to reap those kinds of savings?

Unfortunately for my good friends in the majority party, their legislation to date has not been where their words are. In the energy bill passed during the previous Congress, there were certain tax credits for energy improvements that many people around the country have taken advantage of. I am one of those that did that. I replaced the furnace in my Menomonie Falls, Wisconsin, condominium, and I have been able to recoup, in just a year and a half, the cost of the additional furnace. We have not had global warming in Wisconsin. We had one of the coldest and snowiest winters in the last 30 years there.

However, all of these credits expired at the end of last year. And nobody facing bad gas bills, bad electric bills or, if they heat with fuel oil, extremely bad fuel oil bills has been able to do the type of work that has been given the tax credit, because they don't know whether the tax credit will be there when the time comes to file their 2008 tax returns.

Now, I am told that the majority party is going to put an extender bill on the floor next week. I hope it is not stuck with a whole lot of other things that don't relate to energy and R&D tax credit. But the fact is that we have had almost 5 months slip by with no tax credits for doing these good things on the books. And that is the responsibility of the majority party, and they ought to put their legislation where their hot air has been.

Now, last week I said that energy efficiency can produce great results when encouraged, but, when mandated, these policies have the same effect as a tax. Please note that I am talking about tax breaks rather than higher taxes directly or indirectly. And I think the same principle applies with policies to encourage green buildings. The amount of savings generated by energy-efficient buildings should be encouragement enough for building owners to make these changes. I also think that the Federal Government can help through R&D funding and tax credits. Additionally, establishing industry standards will go a long way toward ensuring that buildings, old and new, are as energy-efficient as possible.

However, the Government should not take it upon itself to be issuing mandates for green buildings, because that will be a tax for many. Not only that, I certainly don't have confidence that the Government regulators will mandate the best, most effective energy solutions. It is not a stretch to think that these regulations will be much less efficient than the buildings that they seek to manage; witness our off-again/on-again tax credit policy.

I think that a mechanism already exists in the U.S. economy to encourage energy efficiency in buildings. The potential savings that green buildings create, coupled with the rising cost of energy, creates a compelling incentive for building owners to improve the efficiency of their structures.

When it comes to efficiency, free-market forces are far more efficient than regulations in turning buildings green. While the regulations may make buildings more efficient, only the free market and a more enlightened tax policy can make buildings and their owners' wallets greener at the same time.

Thank you.

The CHAIRMAN. Thank you.

Again, witnesses, welcome to the debate here. You are arriving at a historic time.

The Chair now recognizes the gentleman from Oregon, Mr. Blumenauer.

Mr. BLUMENAUER. Thank you.

I do want to assure my good friend from Wisconsin that we will be voting for the fourth time on the extenders, that has passed the House three times already, and I hope that we will have, finally, some help on the part of the administration and the Senate.

I take modest exception with the notion that regulation from the Government plays no role. Look how the brilliant market forces have encouraged our friends in Detroit to keep pace with auto efficiency standards. Not. They didn't change for 30 years. We finally re-established them this last year, which I think we would all be better off had we continued to move forward.

We need a balance between regulatory process and free market. We are going to hear from California, where there are some great initiatives that have taken place in terms of the building codes.

I am hopeful that we, as a committee, spend more time on this, because we are going to be replacing almost 200 billion square feet of new offices, stores and other nonresidential construction, and we are going to freeze that carbon footprint in place for 50 or 100 years or more.

I am pleased with what we have done in our community. I am hopeful we still get out to Portland to see what we have done in terms of some of these green building initiatives.

I would like to enter into the record the Green Building Initiative that the Portland Green Building—Green Globe's rating tool that I think has some merit, because we have seen that it makes a difference in our community.

[The information follows:]

Rep. Earl Blumenauer
Statement for the Record
May 15, 2008

Mr. Chairman, thank you for holding this important hearing.

We have to get this right. By 2050, 89 million new or replaced homes as well as 190 billion square feet of new offices, stores, and other nonresidential buildings will be constructed. These buildings will be around for 50 to 100 years, locking in their carbon footprint for decades.

This is an area where there's been lots of leadership at the local level. I am looking forward to Mayor Newsom's testimony.

But I have to use this opportunity to brag about my hometown of Portland as well. The Portland Office of Sustainable Development has taken the lead in promoting green building around the City with free technical assistance for development projects, educational tours and classes, project guidebooks and grants that support innovative green building practices. Last month, the City of Portland and the Energy Trust of Oregon announced $425,000 in grants for a diverse group of innovative buildings – from a LEED Platinum office building on a former brownfield site in downtown, to the global headquarters of Mercy Corps, to a Portland Parks and Recreation aquatic facility, to affordable housing.

My district is also home to a number of green schools, including Clackamas High School and the new Rosa Parks Elementary School, which is Portland Public Schools newest facility and is located in New Colombia, a revitalized neighborhood project that features mixed-income housing. Rosa Parks is LEED Certified, and is 30% more efficient than the Oregon Energy Code requires. The building incorporates daylight, which in addition to reducing lighting-related electricity consumption, brightens the rooms and creates an improved atmosphere for learning. Not only do green schools improve the quality of life of our students, but they help instill environmental sustainability at an early age.

In addition to promoting green buildings at home, Portland organizations have taken the lead in promoting the development of green buildings nationally. For example, Portland's Green Building Initiative has developed the Green Globes rating tool, which attempts to provide a "practical path to green" for all building projects. They have streamlined many aspects of the process and removed barriers to practitioners and the public while keeping high performance standards. I would like to submit for the record a statement from the Green Building Initiative which further describes their work.

These successes could not happen without the leadership of the architects, engineers, and development community. I have been particularly inspired by the Gerding-Edlen Development Company in Portland. They are committed to having all of their projects,

within 5 years, generate more energy than they consumer and to consumer more waste than they create.

One issue that I would like to explore with our witnesses is the issue of location efficiency. How green is a building if someone has to drive 20 miles to and from their place of work and burn a gallon of gas to buy a gallon of milk? According to calculations done by Environmental Building News, commuting by office workers accounts for 30% more energy than the building itself uses.

We need to think broader about how we design our communities in a way that reduces the amount people have to drive. We need to reduce not only the energy use of buildings, but the transportation energy use of buildings. Even if we significantly increase the fuel efficiency of our vehicles and decrease the carbon content of our fuels, we will not meet our climate goals if the amount that people drive continues to increase at current levels. Since the 1980s, vehicle miles traveled has increased three times faster than population growth.

I know that the U.S. Green Buildings Council has started to look at this issue with its neighborhood design program, and I have worked closely with the Enterprise Foundation, which has incorporated some of this into its Green Communities standard. But I think we can go even further to reduce the carbon footprint of our development patterns by better connecting housing and transportation policies.

In an era of high and rising gas prices, location efficiency is extremely important for low income families, who spend a significant amount of their income on transportation costs. Transportation costs currently account for 18% of the average U.S. household expenditures. Transportation costs consume an even larger share of low-income family incomes. A study of 28 metropolitan areas found that families with incomes between $20,000 and $50,000 spend an average of 40 percent of their income on transportation and an average of 28 percent on housing. In addition to reducing their energy bills with efficient homes, we can help families save money by providing them with transportation options and helping them to live closer to where they work and shop. By some estimates, the savings associated with living in a location efficient area can exceed $600 a month.

Location efficiency, smart growth, and alternative transportation are an important part of sustainable development and an important tool in fighting global warming. I hope this committee will continue to explore these issues, perhaps in a future hearing.

Mr. BLUMENAUER. But I would hope that there are two things that we could focus on with the committee. One deals with the location. Yes, businesses are critical, but if you have to burn a gallon of gas to go to lunch, we are in trouble. And we need to coordinate the green building with the green location, location efficiency.

Last but not least, I am very interested in working with this committee and our witnesses about what the Federal Government does to lead by example. We are the largest consumer of energy in the world; we are the largest manager of infrastructure. The Federal Government has an inventory of 300 million square feet, scattered in 60 locations across the country.

If we get serious, if we make a commitment that we are not going to build, buy, lease or rent anything that isn't green-certified with a twist in 2 years, it will have a transformational effect and, I think, help bring to pass what our witnesses will be talking about much sooner.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you.

The gentleman's time has expired.

The Chair recognizes the gentleman from Oklahoma, Mr. Sullivan.

Mr. SULLIVAN. Thank you, Mr. Chairman. Thank you for holding this important hearing today on green buildings.

I look forward to hearing from our witnesses, and I appreciate you being here, especially Tony Stall, from Dryvit, a leader in green building techniques. I am proud to have a Dryvit manufacturing facility in Sand Springs, which is located in Oklahoma's 1st Congressional District.

Last August, I visited this facility and was able to meet with many of the hardworking men and women that make this green technology possible. And it really is a fascinating technology.

Dryvit Systems began manufacturing exterior insulation and finish systems in 1969 and was the first company to do so in the United States. Today, more than one in every 11 commercial buildings in the United States features Dryvit on its exterior.

Companies like Dryvit are innovating technology for both commercial and residential buildings so that these properties can become more environmentally friendly. In fact, homes that use the Dryvit technology on their exterior can save over 40-percent per year on their heating and cooling consumption.

I look forward to the intriguing discussion regarding green buildings during today's hearing. And I yield back the balance of my time.

The CHAIRMAN. The gentleman's time has expired.

The Chair recognizes the gentlelady from California, Ms. Solis.

Ms. SOLIS. Thank you, Mr. Chairman.

And I would like to congratulate you for introducing us to the new recyclable chairs that are here in our hearing room. I hope that members will take that to heart, and hopefully we will be able to have a demonstration of our own to see how they fit. Because, lately, the chairs that we do sit in are very uncomfortable and take up a lot of space.

With that, Mr. Chairman, I would like to thank you for having the hearing. This is a very important topic that we need to discuss here.

And I am very concerned about what is happening in our schools, some of our school buildings, particularly in low-income areas. We have a lot of Title I-funded schools that are found not just in urban and suburban areas but also in rural America. And we would like to see more opportunity so that the greening of America can also happen in our schoolhouses for low-income and under-represented children.

But I would like to thank also our mayor, Gavin Newsom, for being here from San Francisco, a leader in the green movement. And also I want to recognize the City of Los Angeles. We are slowly getting together the pace where we understand the importance of what this all means. And in communities like mine, in east Los Angeles, where a heavy burden is placed on energy consumption and air pollution, many of the contaminants that affect our communities are a direct result of greenhouse gas emissions and all those negative things that have been going on for years that we have been struggling to try to clean up.

But, more importantly, I think where we live and work, in particular in low-income communities—we have most of the blighted areas. We have many warehouses that could be retrofitted. We could find, I think, ways of even helping to train our workforce to get into these jobs.

And that is something that some of us have worked very hard, and I know the chairman has, in terms of helping us also retool those individuals that live in our community through the Green Collar Job Act. And that is helping to invest in our workforce so that we have enough people that are going to be out there placing and installing the solar panels and also working in renewable energy.

So those are things that I care about and I know many members of the caucuses that I work with are very interested in hearing about. So I want to thank all of you for being here, and look forward to hearing your testimony.

Thank you.

The CHAIRMAN. Thank you.

The gentlelady's time has expired.

The Chair recognizes the gentleman from Washington State, Mr. Inslee.

Mr. INSLEE. Thank you. I appreciate this hearing.

I just want to note three groups I met with this morning in my office. It was just an accident that I met with these folks.

First, I met with some folks from utilities. We had one of the presidential candidates out in Seattle yesterday who is urging a massive expansion of nuclear power as part of our baseload; correctly pointed out that it was zero CO_2-emitting. But this utility person reminded me that in every single city and every single State and in every single circumstance, efficiency in reducing load is always cheaper than nuclear power, virtually any other system of generation we have. And it was interesting to me, talking to a person on the front lines, a person really in the utilities, whose job it is to deliver electrons, the first thing out of this person's mouth

was: Efficiency first, because that is where it's always cheaper. And this was right before this hearing.

The second group I met with were sheet metal contractors, and they told me that efficiency in building is the best job-creation system we have in America, because it is not in China, it is here. When we build efficient housing and green buildings, those jobs are right here. They are not going to China. They are right here. This is the one thing you can assure, if you want a stimulus plan, spend money on retrofitting weatherization and clean and efficient utilities and heating and cooling systems.

The third group was the Environmental Entrepreneurs Association. Some people may not have heard about this group, but this is a group with several hundred members of companies across America whose job it is to grow jobs in clean energy. And these people are growing like gangbusters. And a significant portion of them are invested in this type of technology you are talking about, including findings ways—and here is a great one—to sequester carbon in building materials. There is a company out there, whose name escapes me, that is close to finding a way to sequester carbon dioxide in cement. And the scale of this is much larger than one would think.

So here are three groups who wandered by a lone Congressman's office this morning, all of whom see economic growth potential in what you all are going to talk about. Thanks for coming.

The CHAIRMAN. Great. Thank you.

The gentleman's time has expired.

All time for opening statements from the members has been completed. And we now turn and recognize our witnesses for their testimony.

[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
"Building Green, Saving Green: Constructing Sustainable and Energy-Efficient Building"
Wednesday, May 14, 2008

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

The use of energy by building operation is substantial, and this in turn creates a stress on the environment. In 2002, buildings used 68 percent of the electricity consumed by Americans. In many cases, much of energy used by buildings can be saved with the implementation of green building practices. The design and construction of green buildings is simply a common sense investment. If we spend more to construct buildings so that they are more efficient and less wasteful, we will spend less to operate them. The use of active and passive solar, geothermal, and wind energy yield no emissions, and the utilization of sustainable materials in construction has a minimal effect on the environment.

The innovation of building practices to become more "green" is slowly becoming more accessible. If we can help the environment along with helping low-income communities at the same time, we will truly be successful. As a former mayor of Kansas City, Missouri, I am well aware of the need for affordable and sustainable housing in urban areas. Families are struggling to pay their heating and cooling bills each month, but this problem could be alleviated with increased innovation of residential buildings. Congress has the power to make this a reality, and I hope our panel can offer expert advise on this important matter.

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

Thank you.

[The prepared statement of Ms. Blackburn follows:]

Prepared Statement of Congresswoman Blackburn
House Select Committee on Energy Independence and Global Warming's Hearing, "Building Green, Saving Green – Constructing Sustainable and Energy-Efficient Buildings"

Mr. Chairman,

Many Americans today are starting to purchase sustainable, energy-efficient buildings, Energy Star appliances, and recycled furnishings.

But while consumers on their own initiative want green buildings, the federal government is moving towards mandating green building standards in a one-size-fits-all manner.

This is not the right approach.

Consumers and builders should decide what standards should be used that will fit their building and budget needs.

Forcing a particular standard for a "green building" puts the government into the process of picking winners and losers.

A role that the free market should hold.

And a standard that holds true in California may not hold true for another state such as Tennessee.

For example, San Francisco has several energy efficiency standards that impact building permits, home sales, and building renovations. If these standards are not met, a permit could be denied, and a house could lose some of its market value.

My constituents in Tennessee would find this unacceptable. They want to be able to determine how much energy their house or business uses, not the government.

Mr. Chairman,

If government chooses or emphasizes one particular standard through mandates and tax credits, it will limit builders the flexibility for designs that are appropriate for a particular structure.

A one-size-fits-all standard will force costs on American consumers and taxpayers.

It will limit their control of what type of house they want to own.

It will raise their housing costs.

And it will place rigid requirements on public projects that will increase tax burdens of citizens in cities and towns.

Congress should allow robust competition in green standards.
It should let consumers and businesses decide how they want their buildings to be environmentally friendly.

I yield the balance of my time.

The CHAIRMAN. First, we will hear from Mayor Gavin Newsom, who is serving his second term as the Mayor of San Francisco. He is working to meet Kyoto Protocol targets through a variety of ways, including green buildings. San Francisco has developed energy ordinances, initiatives to build to LEED and other green standards.

And I am also pleased to announce that Ameresco, an energy-efficiency company in my congressional district up in Boston, was awarded a contract to green the San Francisco Housing Authority.

And, Mayor Newsom, we are very honored to have you here with us today. Whenever you are ready, please begin.

STATEMENTS OF HON. GAVIN NEWSOM, MAYOR, CITY OF SAN FRANCISCO, CALIFORNIA; MR. KENT PETERSON, PRESIDENT, AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS; MR. EDWARD NORTON, TRUSTEE, ENTERPRISE FOUNDATION; MS. MICHELLE MOORE, SENIOR VICE PRESIDENT FOR POLICY AND MARKET DEVELOPMENT, U.S. GREEN BUILDING COUNCIL; MR. TONY STALL, VICE PRESIDENT OF MARKETING, DRYVIT SYSTEMS, INC.

STATEMENT OF GAVIN NEWSOM

Mr. NEWSOM. Thank you, Mr. Chairman. And thank you for this opportunity. And I appreciate, to Ranking Member Sensenbrenner, the debate and the passion and conviction that you have all demonstrated in your opening remarks. This is a very exciting topic, from my perspective, and an exciting time, and I appreciate all your leadership and your conviction and your constancy on this issue.

Green buildings—you said it, Congressman Markey, at the top—this is one of the areas where we are not focusing enough attention. And most people are not familiar with the costs associated, not only with the operation of buildings, but the construction and demolition of buildings, as it relates to the environment.

In San Francisco, we began over a decade ago and became one of the first big cities in the United States of America to require, to legislate all of our municipal buildings to be built to LEED certification. At the time, people thought, again, another typical San Francisco idea, San Francisco values, the sky is going to fall in, the world is going to come to an end, major tax increases, companies are going to run out of San Francisco. We heard it all.

The reality is it couldn't have been further from the truth, and we are quite prescient now, for the same reasons the ranking member said: We are paying less in energy bills, we are paying less in insurance. And another big point I want to make here today: Fireman's Fund and others are charging less for insurance for some of our buildings that the city was wise enough to invest in as it relates to these LEED certifications.

But that wasn't good enough. We represent as a property owner a de minimus amount of office space in our city. So we put together a work group in 2004 which came up with the first standards in our city's history to advance some incentives for green buildings, with LEED Gold certification.

What happened in 2004 was interesting. We fast-tracked permits through these incentives, and we ended up having a bigger line, a bigger queue for people in the construction and building side of the ledger trying to get in the fast-track permits for LEED-certified buildings than in the traditional lines at our Department of Building Inspection. And it occurred to us then that we have a much bigger appetite and a bigger market for this than we had realized.

The consequence of our 2004 legislation is we decided to more formally advance an initiative to require all residential, all commercial, and all remodels that are done in the City and County of San Francisco to meet similar LEED certification, going to LEED Gold within the next few years.

It is the most aggressive green building standards of any city in the United States of America. It was done with broad consensus and overwhelming support. In fact, perhaps after today, I will receive my first letter of opposition, but I have yet to receive a letter of opposition from anybody.

It was an industry-led initiative, because they get it. They know they ultimately need to get into this business. The fact is, though, they need to be pushed into it. Some of the largest developers in San Francisco, which happen to be the largest developers across this country that do business in almost every major city, they get it. They get it, because it ends up costing them less, it ends up being more attractive from a leasing perspective, higher occupancy rates. Businesses get it, because that is why they want to go into these green buildings, because they have greater workplaces, which drives lower costs associated with sick days, higher morale. These are objective measures that have been analyzed, and I hope you have a chance to read some of these reports, which are extraordinary.

This is inevitable, whether we like it or not. This is the direction we need to be going. This is not difficult for anyone to do.

The idea that the private sector is just going to somehow do it, well, maybe. But the fact that the U.S. Government hasn't done it is suggestive. And if the U.S. Government won't do it, if you won't do it to save energy costs, and HUD won't do it to save on $4 billion-plus a year they are spending on electricity, for the life of me, I don't know necessarily how the private sector is going to end up doing it on their own.

We, again, have been able to establish a framework where we brought parties together. We did it in an environment which was supportive of the private sector; didn't take anything away. We have done it in a way where we have raised the standards and raised the bar.

Now, by the way, we are doing LEED Platinum certification on a lot of our new buildings, not even LEED Silver or LEED Gold. In fact, We have a new one. The Academy of Sciences in San Francisco is the largest LEED Platinum building of its kind in the United States, where someone well described it as lifting up Golden Gate Park, our park, and placing a building underneath it and then placing the park right back on top of the building.

And already in terms of its identity, already in terms of its purposefulness, it is creating a lot of excitement and enthusiasm. And

it will be now the new benchmark, the new bar for all subsequent construction.

So I am just here to say we have to get over the idea that this is somehow extreme. We have to get over the idea this somehow it is even controversial in this day and age.

And from the perspective that Congresswoman Solis said, this is where the jobs are coming from. This is in the photovoltaic and the solar and the energy retrofits. If we are going to get serious about green-collar jobs, get serious about the loss of manufacturing, get serious about environmental justice issues, which Ed and others will talk about in a moment, then we have to get serious about the opportunities as it relates to the green building industry.

And I couldn't be more enthusiastic as a mayor of a city where the people of San Francisco get it. Republicans and Democrats get it. This is not about politics. They understand the economic imperative, they understand the moral and ethnical obligation, and they understand that this works.

And so that is, in essence, what I wanted to leave you with.

[The statement of Mayor Newsom follows:]

SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING

HEARING ON
BUILDING GREEN, SAVING GREEN:
CONSTRUCTING SUSTAINABLE AND ENERGY-EFFICIENT BUILDINGS

May 14, 2008

Testimony of Gavin Newsom
Mayor
City and County of San Francisco

Chairman Markey, Ranking Member Sensenbrenner, and distinguished Members of the Committee. Thank you for the opportunity to testify on the subject of green buildings. In San Francisco, we are proud of our efforts to encourage green building practices. We've gone from modest requirements to green our municipal buildings almost a decade ago to the country's most aggressive green building standards for all new buildings. And critically, with the full support of the building industry and our business community and amidst sustained growth of commercial and residential development.

These impacts of conventional buildings are well known. Seventy percent of total electricity consumption in the US, forty percent of total national energy consumption, and 38 percent of the greenhouse gases produced nationwide are produced by conventional buildings. In San Francisco, this impact is even greater, buildings in our city account for almost half (49%) of citywide greenhouse gas emissions.

In light of these environmental impacts, the advantages of green buildings are abundant: These buildings save energy and water while providing a healthy environment for those working or living in these buildings. They achieve energy efficiency and conservation, improve indoor air

quality, use non-toxic and efficient building materials, and are often located close to public transportation. These buildings save resources while reducing operating costs, and also remarkably improve productivity in the workplace. National studies suggest that resource-efficient buildings can improve worker productivity by as much as sixteen percent by reducing the number of sick days and improving workplace morale.

San Francisco's experience with green buildings began almost ten years ago, in 1999, when we enacted our first green building ordinance. This law change required LEED certification for all city buildings. (In San Francisco, we rely on established national and regional standards such as the US Green Building Council's LEED system and the GreenPoint Rating System). In 2004, we amended this ordinance to require LEED Silver certification for all new municipal construction and renovation projects. This original ordinance also called for a series of ten pilot projects to demonstrate state-of-the-art green building technology.

These pilot projects included the new California Academy of Sciences. When it opens this fall, it will be nation's most visited LEED Platinum building. It will set a new standard of sustainable architectural design, highlighted by green roof of native plants which, in the words of one observer, 'picks up the park and places a building underneath.' Remarkably, this project recycled 100 percent of the old building on site for use in the new building. The building will also include photovoltaics, natural ventilation systems, advanced low-energy lighting controls, and reclaimed/low-flow water systems. Its insulation is even composed of the recycled material of a popular San Francisco invention—blue jeans. This institution will actually use its own

building to teach lessons of environmental stewardship and conservation and engage visitors about the role that the built environment can play in protecting our environment.

Another pilot project in development is the new headquarters of our city's utility, which will be also be built at a LEED Platinum level. It's a new fourteen-story administrative office tower in our Civic Center that will include features such as spectrally-tuned glazing materials on the building to capture and reject solar heat as needed, and light shelves and shading devices with attached solar arrays optimize daylighting while producing electricity on site. It will serve as the hub of a Civic Center Sustainable Resources District—which will link seven buildings including our City Hall to be powered by 100 percent renewable energy. Much of the inspiration for this ambitious network of green building comes from Speaker Pelosi's vision of greening the US Capitol area. These governmental centers—which feature multiple buildings—can and should lead the way as models of sustainability and renewable energy districts within our urban centers.

We're not stopping here. On Treasure Island, a former Navy base positioned between San Francisco and Oakland, we are planning the greenest community in American history with unprecedented sustainability and green building features in the over six thousand homes being constructed. It will be a model of urban density amidst 300 acres of open space, and feature non-auto transportation such as ten minute ferry service to downtown San Francisco.

In 2006, we turned our attention to the entire stock of over 195,000 buildings in our city—both residential and commercial buildings—by establishing a Green Building Taskforce. This taskforce was comprised of ten building industry leaders including building owners, developers,

financiers, architects, engineers and construction managers. They met over the course of several months to determine appropriate incentive and standards to implement in our city and then recommend legislation to my office to introduce to advance this policy.

The taskforce first suggested a priority permitting process for a LEED Gold rated or equivalent building projects. The idea was to create an expedited approval process for buildings that achieve these standards in order to encourage more developers to build green buildings. It was an immediate success, with ten major LEED Gold buildings receiving priority permitting process to date, with seven more awaiting approval.

This incentive is complemented by other tools to help the building industry construct buildings. Our SF Solar Mapping software, for example, uses satellite technology to provide information on the potential solar output on every building in San Francisco. Access the website and simply type in a building address, and this program will tell you the solar energy that could be captured on that rooftop, as well as the environmental and economic savings it will generate.

Then, with the recommendation of the taskforce, we took the largest step to date advancing green buildings in San Francisco: The creation of citywide green building standards for new residential and commercial construction as well as retrofits. The legislation, which is scheduled for approval later this month, imposes green building requirements on newly constructed commercial buildings over 5,000 square feet, and on renovations over 25,000 square feet. The ordinance imposes requirements through a tiered and phased approach. It requires large buildings over 25,000 square feet to achieve LEED Certified standards immediately, and LEED

Gold standards by 2012. Large commercial interior alterations also phase up to LEED Gold standards by 2012, while high rise residential buildings phase up to LEED Silver levels by 2012. Smaller residential buildings phase up to 75 Greenpoints by 2012. (These Greenpoints are part of a GreenPoint rating system suited for smaller residential buildings and established by the organization "Build It Green.")

These standards represent the most aggressive green buildings standards of a major American city and have remarkable benefits projected over the next four years: Electrical savings of 220,000 megawatts; drinking water savings 100 million gallons; waste/storm water reduction 90 million gallons; construction waste reduction 700 million lbs; recycled material value 200 million dollars; 540,000 car trips reduced; and green power generation of 37 thousand megawatt-hours. And most importantly, considering the climate crisis before us, this ordinance is projected to reduce 120 million pounds of greenhouse gases into our atmosphere.

Thanks to the collaborative approach that we took with the development community in creating the standards set forth in this ordinance, we have received almost no opposition to again what are the most aggressive green building requirements in the nation.

Ten years ago, when we talked about green buildings, a perception existed that green buildings were more expensive and only appropriate in 'boutique' situations. Far from high-end boutique buildings, green buildings are being constructed and renovated across our city. Visionary organizations like Enterprise, one of the leaders of this movement represented here today, are through their Green Communities initiative constructing and renovating buildings like Hotel

Essex, an 84-room affordable housing development built in 1912 that will feature a rooftop of solar arrays and a building full of sustainable features.

This perception that green buildings are too expensive for the mainstream has been shattered in our city and region based on the emerging experiences of developers and the cold hard facts and figures of the green building industry.

Trends show that both soft and hard costs for green buildings are decreasing as the market continues to grow and mature. These costs decrease as designers, builders, subcontractors and manufactures gain experience in an expanding market. A recent report compiled for our city (Greg Kats, "Costs and Benefits of Green Building") shows an increase in capital costs of only zero to two percent in our region for constructing a green building, but a return on investment of ten times the initial investment within the first twenty years of operation. Another report that our city utilizes (Davis Langdon report, "The Cost of Green Revisited") actually shows no statistical correlation between cost per square foot and level of LEED certification. Simply put, there are inexpensive conventional buildings and green buildings and there are expensive conventional buildings and green buildings.

Moreover, we're finding that building green buildings is good for the commercial leasing business. Buildings that carry LEED or Energy Star certifications have been shown to have higher occupancy rates and lease for more dollars per square foot than their peers (CoStar Group, March 2008). One major study, which analyzed a database covering billions of square feet of commercial buildings, concluded that "non-green buildings are going to become obsolete."

An additional economic benefit to our green building boom are the jobs that come with this expansion. Today, we have more LEED certified professionals on a per capita basis than any city in the country. New firms have emerged that focus on energy efficiency and sustainability of buildings, and workers are being hired by the thousands to install the elements of building sustainability such as energy retrofits and solar installations. Green buildings are part of a clean technology investment boom in Northern California that is about to pass high technology sector terms of the billions of dollars that are invested in the clean and green technology center.

In San Francisco, our experiences have convinced us of two key points related to green buildings:

First, a clear policy pathway exists to address the over one-third of greenhouse gases that result nationally from buildings. Thanks to visionary energy efficiency standards enacted years ago in California's Energy Code (Title 24), our State's per capita carbon footprint is the lowest in the nation. But in San Francisco, we're not stopping there. Implementing point-based environmental building standards that allow developer flexibility while ensuring a unprecedented levels of environmental performance of our building stock will bring large decreases over time in our greenhouse gas pollution. The pilots and testing have been concluded and green building standards been proven to work. Now its time to implement these heightened standards.

Second, green buildings generate another type of green besides environmental performance: monetary savings for the those who invest and construct in new buildings. In our city, we have

witnessed green buildings providing substantial financial return for the industry leaders who have built these projects—with energy savings and high leasing levels sustained over time. As fossil fuel continues to increase in cost over time, the financial advantage of green buildings multiplies.

To conclude my remarks, I would like to make two recommendations to you as federal policy-makers. First, on a issue currently before Congress: In the presence of generations of preferential financial incentives for fossil fuel production, it is absolutely critical to support a reauthorization of the renewable energy tax credit. As we face the crisis of climate change, it's the absolutely least we can do. In cities with green building requirements, this financial incentive allows buildings to achieve required green standards through installation of renewable energy systems. This investment in renewable energy systems—one of the most important elements of green building—decrease a building's energy requirements and costs, lessen a city's energy needs, and ultimately increase our country's energy independence.

Second, consider shifting the tax burdens of Americans from taxing jobs to taxing pollution. It's remarkable to me that we tax something we want to encourage—jobs and income—and place no tax on what we all agree we want to minimize—greenhouse gas pollution. In San Francisco, we're modeling how this can be done on the federal level by increasing a tax on electricity and natural gas use in buildings and decreasing our local payroll tax by a corresponding amount. This tax reform policy will provide an even stronger financial incentive for the construction of green buildings and maximize energy conservation and efficiency in existing buildings. Make

no mistake, this isn't a tax-and-spend concept, but rather a revenue neutral reform that shifts tax burden from taxing jobs to taxing the causes of pollution.

Addressing the climate crisis requires fundamental, visionary policy transformation. Anything less and we will fall short of the environmental leadership that the climate crisis demands of us.

Thank you very much for the opportunity to testify here today.

The CHAIRMAN. Thank you. I appreciate it, Mr. Mayor. That was great testimony.

Now our second witness. You know, when you are thinking about energy efficiency, what is it that causes all these greenhouse gases? Well, it is keeping this room cool in the summer, making sure it is warm in the winter, making sure that the food that we eat in this building is kept refrigerated winter, summer, spring and fall. But if you can make it all more efficient, then we will be all the better off, because you could reduce by 30, 40 percent the amount of energy we consume.

We have with us today the president of the American Society of Heating, Refrigeration and Air-Conditioning Engineers in the United States. And his organization, for 114 years, has been advancing technologies in each one of these related fields. And at the request of the Federal Government, his organization has developed the first Federal energy efficiency standards 30 years ago, and they continue to develop new building and energy codes used by local, State and Federal governments.

Mr. Peterson, welcome. Whenever you are ready, please begin.

STATEMENT OF KENT PETERSON

Mr. PETERSON. Thank you, Chairman Markey, Ranking Member Sensenbrenner and members of the committee. Thank you for the opportunity to speak to you today about energy use, buildings, and the opportunities to reduce our impacts from buildings on our climate change.

My name is Kent Peterson, and I am the current volunteer president of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, better known as ASHRAE. We were founded in 1894, and ASHRAE is an international technical society with over 50,000 members in 140 countries. Our members really represent the breadth of technical professionals in the building industry, from building designers to building owners to manufacturers and building operators.

You know, ASHRAE fulfills our mission by advancing heating, ventilating and air-conditioning and refrigeration technologies to serve humanity and promote a more sustainable future through not only our research, but our standards writing processes, our publications and our continuing education programs.

But turning our attention on today's topic, with increased energy costs and climate change considerations, design guidance related to energy efficiency is more important than ever. Nowhere is it more important than in the building industry, given that buildings do consume roughly 40 percent of the primary energy in the United States.

Today, building energy efficiency still represents a vast and underutilized energy resource within the United States. Building energy efficiency is the single most important opportunity for reducing global greenhouse gas emissions.

In my opinion, today's buildings mortgage our energy and environmental future. In the past, our industry really focused on the minimum energy-efficiency requirements. But today, we are really focusing beyond minimum energy-efficiency requirements, into green buildings, what are the requirements for people that want to

build buildings that perform much better than the minimum requirements required by code.

Given the concerns regarding climate change, our industry really is undergoing a market transformation. It is going to change the way that buildings are designed, built and operated.

In the past, we have been able to provide comfortable, healthy and safe buildings. But on the flip side, it is the energy consumed by these buildings that is helping fuel this new crisis. And it is a crisis of global energy availability, and it certainly is impacting us in the United States.

Unfortunately, the energy consumed by these buildings is starting to increase. In May of 2007, it was the U.S. Energy Information Administration that released a report that projected that world energy consumption is projected to increase approximately 57 percent from the year 2004 to 2030. And while energy consumption and prices continue to rise, the true costs of using energy are even higher when we consider its impacts not only on climate change but on future generations.

The sad thing is that most Americans know how fuel-efficient their automobiles are but very few understand how much energy buildings consume. ASHRAE is working to change this in a variety of ways. We are developing significant improvements in the minimum energy-efficiency requirements in ASHRAE's Standard 90.1, which serves as the basis for model U.S. energy code for buildings today.

We are providing for advanced energy design guidance through special publications, working with partners like the United States Green Building Council, in trying to get this information out to the marketplace as free resources, so not only building owners but building designers, architects and consumers understand what the possibilities are to build more efficient buildings than what the minimum code requires today.

We are also in the process of developing a building energy label that will provide builders and occupants with a standard energy metric that can be easily compared across different building types. It is providing these minimum code requirements and above-code requirements is really what is critical to provide improved energy efficiency in buildings in the United States. We must continue on the path of our Nation's buildings to be more efficient, but it is going to require significant commitment from all the stakeholders.

I offer the following recommendations to ensure that we meet future requirements and demands placed on our buildings. We really do need to adequately fund the Federal agencies to advance the development and enforcement of energy standards, guidelines and technologies.

We should support research and development necessary for the development and deployment of technologies necessary to achieve our Nation's energy goals as we move forward. This includes technologies that are going to be envisioned under the Zero-Net-Energy Commercial Building Initiative that was established in the Energy Independence and Security Act of late last year.

Additionally, sufficient investments are going to be made in research and development for renewable energy technologies as we strive for net-zero carbon buildings and net-zero energy buildings.

We also need to enact policies and encourage individuals and businesses to implement energy-efficient technologies and practices that go beyond the minimum requirements that are required by the building energy codes today. This includes the commercial building tax deduction and setting realistic depreciation schedules for heating, ventilating and air-conditioning equipment, which are currently set at 39 years.

We need to continue to support the utilization of voluntary consensus standards and regulation and codes, as required by the National Technology Transfer and Advancement Act.

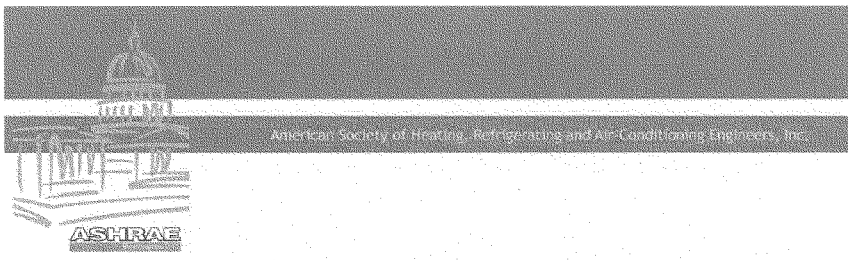
The CHAIRMAN. If you could summarize, please.

Mr. PETERSON. Yes.

We must apply our knowledge and experience to really provide effective, practical and innovative solutions as we try to transform the U.S.-built environment to green buildings.

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

[The statement of Mr. Peterson follows:]



Testimony of
Kent W. Peterson, P.E., Fellow ASHRAE
President, American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

To the
U.S. House of Representatives
Select Committee on Energy Independence and Global Warming
May 14, 2008
Washington, DC

Hearing on: "Building Green, Saving Green: Constructing Sustainable and Energy-Efficient Buildings"

Chairman Markey, Ranking Member Sensenbrenner and members of the committee, thank you for the opportunity to speak to you today about energy use, buildings, and opportunities to reduce their climate impacts. My name is Kent Peterson, and I am the current volunteer president of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, better known as ASHRAE.

Founded in 1894, ASHRAE is an international nonprofit technical engineering society of 50,000 members in over 140 countries. Our members represent the breadth of professionals involved in the built environment from consulting engineers and architects to manufacturer's representatives and academicians.

ASHRAE fulfills its mission of advancing heating, ventilation, air conditioning and refrigeration (HVAC&R) to serve humanity and promote a sustainable world through research, standards writing, publishing and continuing education.

ASHRAE has a long history in energy conservation and is committed to economic energy-efficiency standards and advanced guidance. In the 1970s during this nation's previous energy crisis, the federal government approached ASHRAE to develop a standard to address the energy use of buildings. This standard became ANSI/ASHRAE/IESNA Standard 90.1--Energy Standard for Buildings Except Low-Rise Residential Buildings. Standard 90.1 serves as the national reference for state adopted commercial building codes through the Energy Conservation and Production Act (ECPA).

ASHRAE Government Affairs • 1828 L St., N.W., Ste. 906, Washington, DC 20036-5104 USA
Tel: 202.833.1830, Fax: 202.833.0118

As we enter a new time of energy awareness, there are many factors drawing attention to energy use—concerns about our sources of energy, rising energy costs, and the impacts of climate change. Our nation's buildings account for 40 percent of our primary energy use—more than both transportation or industry. They are responsible for 72 percent of the electricity consumption and 39 percent of the total U.S. carbon dioxide emissions. These CO_2 emissions approximately equal the combined emissions of Japan, France, and the United Kingdom.

Standard 90.1: Its Development and Its Future

Building codes serve as the primary mechanism for reducing energy consumption in buildings. Energy Codes are a subset of a broader group of requirements governing the design and construction of buildings. Building codes establish minimum requirements for issues of importance within a community—including safety, accessibility, health, and energy use. Building codes generally reflect a consensus of current design and construction practice. In this country, building codes generally are considered a state and local government issue.

Standard 90.1 serves as the basis for many commercial building energy codes across the country. As an American National Standards Institute (ANSI) approved standard, the development of Standard 90.1 adheres to rigorous principles based on consensus, openness, balance, transparency, and due process. In fact, ASHRAE is one of only five ANSI Audited Designators which means we have established and maintain a consistent record of successful voluntary standards development.

The Standard is developed by a committee made up of technical experts representing different aspects of the building community including product manufacturers, energy efficiency advocates, academics, government, building owners, utilities, and consulting (or design) engineers and architects. Once the committee reaches consensus on a draft of the standard, it is open for a period of public comment. Once comments are received, the committee must attempt to resolve all comments before presenting the standard to the ASHRAE Board of Directors for publication. Both within the ASHRAE structure and the ANSI structure there are opportunities for appeal for anyone who feels that their comments regarding the standard are not adequately addressed.

Both Congress and the Executive branch have recognized the value of voluntary consensus standards by requiring their use in regulations when consistent with agency policy and appropriate for agency purposes (National Technology Transfer and Advancement Act of 1995 (P.L. 104-113) (NTTAA) and OMB Circular A-119). Many voluntary consensus standards are appropriate or adaptable for the Government's purposes.

As mentioned above, states are required in the Energy Conservation and Production Act to adopt commercial building energy codes at least as stringent as Standard 90.1-2004 (42 U.S.C. 6833). However, there are no real penalties for states who do not comply with this requirement, but incentive funding is available for states and localities to implement the requirements. See attached Exhibit A for a map of the current status of commercial building energy codes within the states.

When a revised version of Standard 90.1 is released, the Department of Energy is required within 12 months to determine if the revisions made will improve energy efficiency in commercial buildings. The standard is updated on a three year cycle with the latest version being Standard 90.1-2007. Once a positive determination is made, each state must within two years certify that it has reviewed and updated its commercial building energy code in accordance with the revised Standard. Such certifications should include a demonstration that the provisions of the state's codes meet or exceed the revised Standard.

Standard 90.1 addresses many aspects of buildings that contribute to the overall energy use attributable to a building. These include:

- Building envelope or shell: includes required insulation values, window characteristics and allowable air leakage
- Heating, ventilation and air-conditioning: includes equipment efficiency requirements
- Service water heating: includes equipment efficiency requirements
- Lighting: includes allowable power use by lighting for particular space uses

Standard 90.1 provides minimum energy-efficient requirements for the design and construction of new buildings, building additions, and new systems and equipment in existing buildings. Thus, the Standard is not applicable for existing buildings except to the extent that replacement systems and equipment should comply with the Standard. Other elements such as the building envelope are more difficult to alter once the building is constructed. It would not be practical to require all building components to be brought up to minimum code requirements established for new buildings when the building is renovated—such a requirement could result in considerable expense or even require demolition of the building (resulting in considerable waste).

Some jurisdictions such as San Francisco require homeowners to bring certain elements of their home up to code before they are sold. Such a requirement could be implemented on the sale of commercial buildings or upon renovation. Additionally, tools such as the building energy labeling program outlined below and incentives such as the commercial building tax deduction can encourage building owners to consider implementing energy saving technologies and practices. Energy service companies (ESCOs) also can provide low cost and low risk solutions to building owners looking to reduce energy use. The ESCO finances the building upgrades and the building owner pays back the cost from the energy savings achieved.

Existing buildings represent a significant proportion of the current building stock and must be considered in strategies to reduce energy use. The Pacific Northwest National Lab (PNNL) has estimated that the median lifetime of commercial buildings is 70 to 75 years. This results in an anticipated attrition rate of just two percent of floorspace per year. About 40 percent of the existing commercial building stock was constructed before 1970 and thus before building energy codes.

ASHRAE has tools and practices to address the energy use associated with existing buildings, and we continue to develop additional tools. ANSI/ASHRAE/IESNA Standard 100-2006 provides a framework for achieving energy conservation in existing buildings. Proper building operations and maintenance also is critical. ASHRAE is near completion on a standard for operations and maintenance (O&M). We are developing an O&M personnel certification

program to recognize practitioners who possess the knowledge to develop and implement an effective O&M program. Recommissioning and retrocommissioning also are important tools to ensure buildings and equipment are operating as they were designed. ASHRAE has several guidelines that lay out the methodologies for completing the commissioning process.

In addition to the need for having up-to-date building codes on the books, jurisdictions must have the necessary enforcement mechanisms and training to assure its compliance. As state and local building departments struggle with smaller budgets and increasing workloads, energy efficiency requirements often are seen as luxuries if time and funding allow. The Department of Energy and private sector organizations like ASHRAE offer excellent training opportunities for building code officials and consulting engineers, but their widespread use also is limited by the availability of financial resources.

As the ASHRAE membership began to recognize the critical role buildings play in energy use and climate change, the ASHRAE Board of Directors established a goal of 30 percent reduction in allowable energy from the 2004 version of Standard 90.1 to the 2010 version. While this goal was established by the Board of Directors, the adherence to the ideals of the ANSI process is paramount. However, I am pleased to report that the standard project committee is working diligently toward the established goal. Additional energy efficiency goals were established for other standards and guidance including publication of guidance for achieving net-zero energy buildings (NZEBs) by 2020 and a standard for achieving NZEBs by 2030.

Going Beyond the Minimum

While Standard 90.1 establishes a minimum level of energy efficiency, we have several initiatives to provide guidance to those who wish to go beyond the minimum requirements and to encourage greater development and deployment of technologies and best practices that can move the market toward increasingly more energy efficient buildings.

These tools include the Advanced Energy Design Guides (AEDGs) which provide prescriptive means for achieving 30 percent savings over Standard 90.1-1999. AEDGs focused on existing buildings and achieving 50 percent and greater energy savings also are in development. These guides are developed in partnership with the Department of Energy and other members of the building community. Over 90,000 copies are in the hands of practitioners and decision makers. Other publications including the *ASHRAE GreenGuide* provide guidance for the design of HVAC systems.

We are working with the U.S. Green Building Council and the Illuminating Engineering Society of North America to develop a code-adoptable standard for the design of high-performance green buildings. Standard 189.1P likely will be released later this year and will cover all aspects of building design from choices on site and orientation to water and energy use. The energy section is aiming for a 30 percent improvement above Standard 90.1-2004. Even before its completion, we have received indications that many jurisdictions are interested in adopting the Standard as part of its building code.

While consumers have a metric for understanding the relative efficiency of their car with respect to other drivers—miles per gallon—the public and many building owners cannot grasp the concept relative to buildings. Therefore, ASHRAE is in the process of developing a building energy label which will provide building owners and occupants (and potential purchasers) with a standard energy metric that can easily be compared across buildings. Such a label will provide an incentive for building owners to provide improved energy efficiency relative to their neighboring buildings. We also are structuring the label to encourage the use of building energy modeling early in the design process. We have already seen that buildings that participate in programs that differentiate them from other buildings (including the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) and the EPA's EnergyStar program) rent quicker and have more satisfied tenants.

In encouraging building owners to go beyond minimum requirements it often is necessary to make the business case for advanced energy efficiency. Through our participation in the Retailer Energy Alliance, we have seen that major corporations such as Wal-Mart, Target, Whole Foods and others have found energy efficiency to be a good investment.

The federal government already is required to meet energy efficiency targets for new buildings that are 30% more stringent than Standard 90.1-2004 (Energy Policy Act of 2005, §109). Federal buildings may account for about 1.4 percent of the total commercial construction volume or 28 million square feet a year. In one year, this new requirement will result in 35,800 metric tons of CO_2 emissions avoided, 317 tons of NO_x emissions avoided, and 625 tons of SO_2 emissions avoided. These savings will compound as federal construction continues and buildings are occupied.

In the energy bill recently passed by this Congress—the Energy Independence and Security Act (EISA)—additional requirements were placed on new federal buildings including reducing the fossil fuel based energy consumed to zero by 2030. ASHRAE and others within the building community are working with GSA and other federal agencies to provide the technical guidance, technologies, and education and training necessary to achieve these requirements.

Providing these above code technical resources now is critical to show what is possible for improved energy efficiency and encouraging the market to embrace such measures by recognizing the social, ethical, practical, and economic reasons for doing so. We must continue on the path of making our nation's buildings more energy efficient, but this requires a significant commitment from all stakeholders.

ASHRAE and Climate Change

As the public, Congress, and ASHRAE members become increasingly interested in developing solutions to address climate change, we see buildings as a necessary part of these solutions. Beyond our focus on energy efficiency, we have a project underway to determine the actual carbon emissions associated with buildings.

The Carbon Emissions Tool Project is focused on estimating the carbon emissions associated with buildings. Currently, building design professionals estimate the annual energy consumption

that will be required to operate the building, and then apply actual average annual carbon emission factors to those estimates in order to estimate the annual carbon emissions associated with the building's operation. There is no standard practice for selecting and applying carbon emission factors applied to electricity whether purchased from a utility or produced on-site.

The ASHRAE Carbon Emissions Calculation Tool is intended to increase the accuracy of the data and methods used to estimate greenhouse gas (GHG) emissions. More accurate data and standardized, improved methods will enable engineers, architects, and other building design and operational professionals to make better-informed decisions regarding the base year carbon intensity of buildings and the potential carbon emissions savings associated with investments in efficiency.

The resulting emissions profile data can be used by designers and operators of buildings to determine the effect of a particular design/operations decision. Designers and operators will be able to determine the best technology or financial "investment" based on maximum carbon emissions reductions.

While this program will provide significant knowledge and contribute to the future development of ASHRAE standards and guidance, it is too early to know exactly how they will be incorporated in the future. However, ASHRAE members are focused on increasing the energy efficiency of buildings without sacrificing the indoor environmental quality (IEQ) of buildings including maintaining good indoor air quality. Since the majority of greenhouse gas emissions associated with the building sector is tied to the electricity and natural gas utilized within the building, we are currently focused on reducing the energy required to power buildings and utilizing renewable energy sources to make up the difference (NZEBs). As indicated above, we are focused on providing the tools necessary to achieve our national energy goals.

Recommendations for Meeting Future Needs

I offer the following recommendations to assure that we meet the future demands placed on buildings:

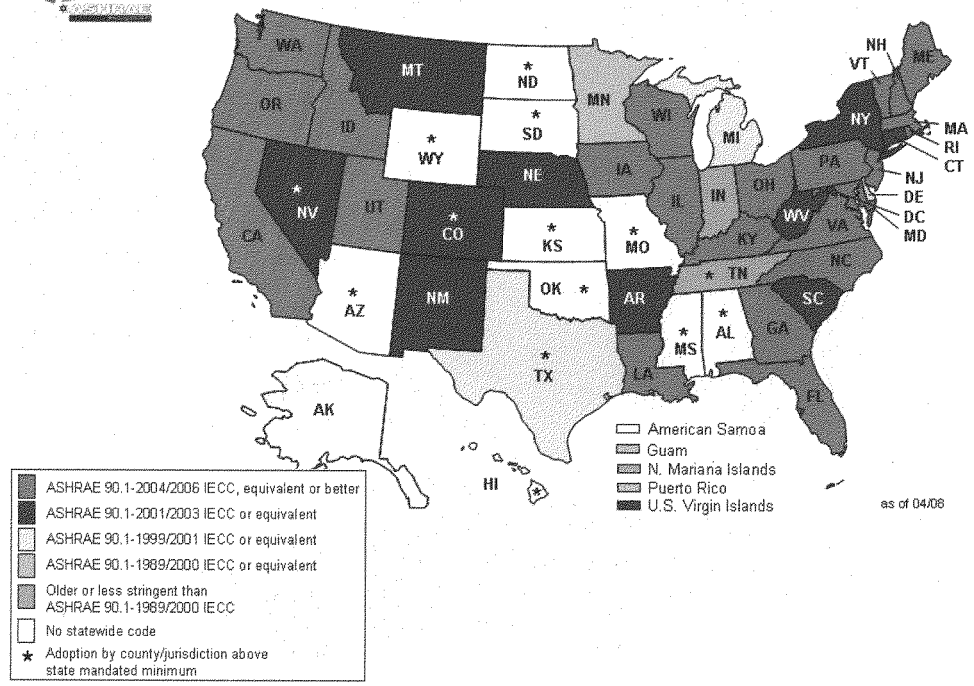
- Adequately fund the federal agencies that advance the development and enforcement of energy standards and guidelines including the Department of Energy, National Institute of Standards and Technology, Environmental Protection Agency, and the General Services Administration which serves as a leader in the implementation of leading edge technologies and practices.
- Support the research and development necessary to develop and deploy cost effective technologies necessary to achieve our nation's energy goals. This includes the technologies envisioned under the Net-Zero Energy Commercial Building Initiative established in EISA. Additionally, sufficient investment must be made in R&D for renewable energy technologies such as solar, wind, water, biomass, and geothermal. These renewable energy technologies will be critical components of the design and construction of net zero energy buildings—funding for their development must parallel their importance to their role in net zero energy buildings.
- Enact policies that encourage individuals and businesses to implement energy efficient technologies and practices that go beyond the minimum requirements. This includes the

commercial building tax deduction and setting realistic depreciation schedules for HVAC&R equipment.

- Continue to support the utilization of voluntary consensus standards in regulation and codes as recognized by The National Technology Transfer and Advancement Act of 1995 (P.L. 104-113) (NTTAA) and OMB Circular A-119.
- Support education programs focused on providing students with competence in science, technology, engineering and mathematics (STEM). As we are challenged to improve the performance of buildings, we will need a skilled engineering and technician workforce to assure that the buildings are properly designed, constructed and maintained.

Thank you again for the opportunity to address the committee. Please feel free to contact me or our ASHRAE Washington Office should you require any additional information on buildings related issues.

Exhibit A: Current State Adoptions of Standard 90.1



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

Our next witness is Edward Norton, who is an accomplished actor and native son of Boston. But he is here in the role of trustee of Enterprise Community Partners, an enterprise developing the first national green building program focused entirely on affordable housing.

Mr. Norton has been environmentally active for many years and recently worked to improve the carbon footprint of the filming process in his upcoming movie, "The Incredible Hulk," a green monster indeed. [Laughter.]

So we actually have one in Boston at Fenway Park, a green monster. And now we have one in Hollywood that is working to serve as an example for other movie-makers.

Mr. Norton, we are really honored to have you with us here today. Whenever you are ready, please begin.

STATEMENT OF EDWARD NORTON

Mr. NORTON. Thanks, Chairman Markey and all the members of the committee. It is a great opportunity to testify on this subject.

As you said, I am testifying on behalf of Enterprise Community Partners. Enterprise, for those of you who don't know, is a national nonprofit organization whose mission is to ensure that all low-income people in the United States have the opportunity for fit and affordable housing. Enterprise provides financing and expertise to community-based organizations for affordable housing development and other community revitalization activities.

We have invested more than $8 billion and created 240,000 affordable homes, strengthened communities through hundreds of cities across the country. And Enterprise also works very closely on a bipartisan basis with policymakers at all levels of government to develop solutions to low-income housing needs.

Now, I feel like I need to give a little context here. You gave some. If you happen to occasionally go to the movies during the summer recess, then you are probably wondering why I am here. But Enterprise was founded by my grandfather, James Rouse, and his wife Patty in 1982. My grandfather was a very well-known urban philosopher, developer, planner, and a champion of American cities. He was fond of saying that, "To build a better city is to work at the heart of a civilization." And I have always tried to keep thinking of that.

After retiring from his career in commercial development, he spent the remainder of his life committed to expanding opportunities for low-income people, and he was awarded the Presidential Medal of Freedom for this work in 1995 by President Clinton. He was a great inspiration to me, he is the main reason that I am here, and to all who knew him as well. Enterprise reflects his convictions today and his entrepreneurialism and his innovation.

I worked for Enterprise for a few years right after college while I was moonlighting in a theater. And when the moonlighting started to become a paying occupation, I went on the board. [Laughter.]

So I have been on the board since 2000. And my principal interest and contribution has been to push Enterprise to lead on the issue of greening the affordable-housing development model.

So hopefully now nobody will write this off as Chairman Markey pulling cameras into his committee room and you will indulge me in the actual testimony.

Obviously, all of you are well aware, as everyone here at the table has been saying, of the impact that residential and commercial buildings have on the greenhouse gas production. We are very pleased that the committee is focused on buildings as part of its leadership on climate change and energy issues generally. And we feel, at Enterprise, that what we can speak to specifically are the unique aspects of affordable housing in this context, which is often left out of these conversations.

I think a lot of people assume that green practices are the provenance of commercial real estate, and that is absolutely not true, and we are determined to include affordable housing in this conversation.

Enterprise recently published a white paper laying out a comprehensive case for connecting affordable housing to climate change and energy needs and solutions through a Federal policy platform called, "Bringing Home the Benefits of Energy Efficiency to Low-Income Households." The paper is enclosed in our written testimony, so all of you have it, and I will address it only briefly.

Enterprise primarily works to bring benefits of sustainable development to low-income people on a fairly unprecedented scale through something that we started called the Green Communities Initiative. Through Green Communities, Enterprise is providing funds and expertise to build and rehabilitate for-sale houses and rental apartments that are healthier for low-income residents and more energy-efficient and better for the environment.

Green Communities homes are built according to our Green Communities criteria, which, before LEED even, was the first national framework of standards and practices for green affordable housing. We have invested over $570 million in this initiative and have built 11,800 affordable green homes in 28 States, as of now.

We feel we have gained a couple of key insights through the work.

The first is that green and affordable are not just intertwined but that they are, in fact, inextricably linked agendas, insofar as low-income people and communities suffer disproportionately from housing challenges, energy costs and effects of climate change.

The good news is that we can now demonstrate very conclusively that those agendas to create and build green and meet affordable-housing demand can be one and the same. We can show that the costs are only about 2 to 4 percent higher, and that this premium tends to come down for developers as they gain experience.

We can show that most of the marginally higher costs attributable to these measures generate financial savings for low-income families, to whom those savings definitely matter the most. In other words, those techniques do pay for themselves in an affordable context, and usually very quickly.

We can show that greening affordable development at scale does result in measurable improvements in health and reduced health-care costs, especially asthma; that green and affordable housing at scale reduces carbon emission very measurably. And the evidence

to back these assertions is included also in the written statement that we have given you.

The other key insight that we have derived pursuing these goals is that Federal leadership is essential and that a national commitment to this agenda in affordable housing is sorely lacking. We need national, bipartisan commitment to this effort.

Our 10-point plan lays out key elements of what we think that commitment should entail, and it is included in our statement. But in the broad strokes, a Federal commitment of $5 billion a year over 10 years could deliver huge benefits across the board: 25 to 40 percent energy savings in up to 25 million residential units; up to 50 million tons of carbon dioxide emissions avoided; and hundreds of thousands of green jobs created annually.

This Federal commitment is relatively modest if one considers that HUD, as Mayor Newsom mentioned, currently spends more than $4 billion annually just to pay utilities in very inefficient, Government-assisted properties. $5 billion is a very small share of the projected revenues that would be generated under proposals to curb greenhouse gas emissions currently under consideration in Congress and supported by all three major presidential candidates.

The solutions are definitely available, but there is no more time, we feel, for small-scale, incremental progress. We think that policymakers need to act with urgency and seriousness of purpose, for starters. Congress just simply should not allow taxpayer funds to support building of any kind that does not meet a more demanding minimum standard for energy efficiency and indoor air quality and lower carbon emissions.

To wrap it up, I mean, to make it a more personal statement, I am sure that many of you saw, as I did, the recent paper that was submitted by NASA's chief climatologist, James Hansen. I met him with Congressman Markey, the other day.

The abstract attached to it argued that, and I will quote him, "If humanity wishes to preserve a planet similar to that on which civilization developed and on which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggests that CO_2 will need to be reduced from its current 385 parts per million to, at most, 350 parts per million."

And that is a tough diagnosis, and it is a monumental challenge. So the significance of these issues that you are debating really can't be overstated.

We talked about this at the Earth Day rally, the other day. I think that every generation is called on in different ways to serve a higher purpose. I think I am the youngest person at the table, and I wanted to comment that my grandparents' generation rose up, faced a great war against fascism and totalitarianism. My parents' generation carried the torch of civil rights and social equality. I have very little doubt, personally—I am 38 years old—I have very little doubt that the legacy of my generation is going to hinge on how we respond to these revelations that we are not living sustainably and that we are altering the environment.

And I feel very confident in saying that my generation and even those younger than us have truly embraced this as our cause and that we are ready to rise to this challenge. But bluntly, we are not yet running things; you are. And this is a problem, because the

scale of this challenge is going to require bold action on a national level. And our generation does not want to be told to "go shopping" right now. We are ready to sacrifice, as our parents and grandparents did. We want to do nation-building, but we want to start at home by playing our part in creating the next prosperous American century.

But somebody has got to call on us to do this by defining this as a test of our American character, much as Lincoln and Franklin Roosevelt and John F. Kennedy and other great leaders did in their time. And we need it clearly articulated as a national priority, and we need the bar set very high, much higher than it has been, because timidity is going to squander our generation's resolve and resourcefulness.

So all of us at Enterprise commend you for convening this hearing, and we are available to answer any questions. Thank you for the opportunity.

[The statement of Mr. Norton follows:]

Testimony of Edward Norton
On Behalf of Enterprise Community Partners
For the Select Committee on Energy Independence and Global Warming
United States House of Representatives

"Building Green, Saving Green: Constructing Sustainable and Energy Efficient Buildings"
May 14, 2008

Introduction

Chairman Markey, Ranking Member Sensenbrenner and members of the Committee, thank you for this opportunity to testify on the subject of green building. I am Edward Norton and my testimony is on behalf of Enterprise Community Partners and its subsidiary organizations (Enterprise).

Enterprise is a national nonprofit organization whose mission is to ensure that all low-income people in the United States have the opportunity for fit and affordable housing and to move up and out of poverty into the mainstream of American life. Enterprise provides financing and expertise to community based organizations for affordable housing development and other community revitalization activities throughout the U.S. Enterprise has invested more than $9 billion to create more than 240,000 affordable homes and strengthen hundreds of communities across the country. Enterprise also works closely on a bipartisan basis with policymakers at all levels of government to develop solutions to low-income community needs.

I have been a member of the Board of Trustees of Enterprise Community Partners since 2000. Enterprise was founded by my grandfather, James Rouse, and his wife Patty in 1982. My grandfather was well known as a visionary developer, planner and champion of American cities. He was deeply committed to expanding opportunity for low-income people. And he was an environmentalist. Enterprise reflects those values today, as well as my grandfather's compassion, entrepreneurialism and innovation.

Enterprise commends the Committee for convening this hearing. The fastest way to make the most progress most quickly on climate change is by reducing energy waste in buildings. The most cost effective ways to do that are by retrofitting existing buildings, while the deepest energy and greenhouse gas reductions can be made in new buildings as they come on line. We must address existing and new buildings and in each case major gains are achievable by applying what we know today.

Residential units – owner occupied houses and rental apartments together – account for the largest share of energy use and greenhouse gas emissions of any building type. The homes of our lowest income citizens, including vulnerable populations like seniors and the disabled, are especially needy and deserving of improvements to increase their energy and water efficiency, improve their indoor air quality and connect them to transit and greenspace.

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The principles and practices of "green" development offer proven, cost effective ways to address rising energy costs and current and longstanding housing challenges, as well as global warming. "Greening" affordable housing – making it more energy efficient, as well as healthier and more environmentally responsible – is also a tangible way to ensure that the enormous promise of the emerging green economy includes opportunities for everyone in our society. And green development provides a powerful framework for rethinking how we create and sustain communities that are better places for all citizens and future generations.

So we are pleased that the Committee has focused on buildings as part of its leadership on climate change and energy issues. We are grateful for the opportunity to speak to the unique aspects of affordable housing in this context.

Enterprise is working to bring the benefits of sustainable development to low-income people at an unprecedented scale through our Green Communities initiative. Enterprise's vision through Green Communities is for all affordable housing in the United States to be environmentally sustainable. Based on our experience and remarkable momentum across the country, we believe that goal is achievable in the near term, with major potential benefits for low-income people and communities, as well as the environment. To achieve it, we must act with boldness and a sense of urgency. It is time for a national commitment to make green and affordable one and the same.

If my testimony achieves one thing, I hope it will be to inspire the Committee to make green homes and communities for low-income families a priority in the national effort to fight climate change.

The Case for a National Commitment for Green Affordable Homes

Enterprise has laid out a comprehensive case for connecting affordable housing, climate change and energy needs and solutions through a federal policy platform in a new paper entitled *Bringing Home the Benefits of Energy Efficiency to Low-Income Households*. This paper is enclosed with my testimony so I will only summarize it here.

There are roughly 25 million households with annual incomes of $25,000 or less in the country. This income level is generally in line with the federal housing policy definition of "very low-income" and approximately equivalent to 50 percent of the national median income and 150 percent of the federal poverty level for a family of three.

Rising home energy costs have far outpaced income gains for very low-income people in recent years. Utility bills often impose a financial hardship on these households, forcing many to make desperate tradeoffs between heat, electricity and other basic necessities. Low-income and minority communities especially bear the impact of climate change, though they have done the least to cause the crisis.

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Yet some otherwise worthy ideas for fighting global warming, such as proposals to cap greenhouse gas emissions, could impose significantly higher costs on the poor. Nearly half of the increased costs could come from more expensive home energy.

A national commitment to green affordable homes could address all those issues. Independent research – and Enterprise experience, discussed more below – has shown that green affordable homes can generate substantial cost savings from lower energy and water use and contribute to better health outcomes for children with asthma. Green homes also can help lower carbon dioxide emissions and reduce local energy and water burdens as part of comprehensive local climate protection strategies.

In addition, the construction and rehabilitation of green affordable homes can be the basis for creating large numbers of good "green jobs" for which low-income people can be trained. Green affordable development at scale can also help stabilize communities struggling with the fallout from high concentrations of home foreclosures. (As Congress works to address the foreclosure crisis, specifically the redevelopment of foreclosed vacant properties, we should ensure that resources to support these efforts support green practices.)

We can make progress on all these issues simultaneously and lock–in long term environmental, energy and other benefits for very low-income households by making an investment in greening their homes. A federal commitment of $5 billion a year over 10 years could deliver huge benefits across the board: 25 – 40 percent energy savings in up to 25 million residential units, up to 50 million tons of carbon dioxide emissions avoided and hundreds of thousands of green jobs created annually when fully implemented.

Such a federal commitment is relatively modest when one considers that the U.S. Department of Housing and Urban Development (HUD) currently pays more than $4 billion annually in utility bills in often inefficient government-assisted properties that constitute a fraction of the homes and apartments that could benefit. And $5 billion is a very small share of the projected revenues that would be generated under proposals to curb greenhouse gas emissions under consideration in Congress and supported by the major candidates for president.

Greening all affordable homes would require long-term commitment for practical as well as budgetary reasons. Conditions vary widely across the affordable inventory. There is a need to scale up the delivery system – contractors, energy auditors and local government staff – to implement a major national effort. And investments in green affordable homes must go hand in hand with strategies to encourage smarter land use and transportation.

But there is no more time for small-scale solutions and incremental progress. Policymakers must act with urgency and seriousness of purpose. Mayors and governors are taking on the challenges with increasing boldness. Congress must do the same, led in the House by this committee. The balance of my testimony addresses the specific questions from Chairman Markey in his letter inviting me to testify.

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Responses to Questions from the Committee

Why did Enterprise develop the Green Communities program?

Enterprise created Green Communities in 2004 with an initial commitment of $555 million to create 8,500 green affordable homes for low-income people over five years, with the ultimate goal of making environmentally sustainable development the mainstream in the affordable housing industry. Through Green Communities, Enterprise provides funds and expertise to enable developers to build and rehabilitate for-sale houses and rental apartments that are healthier, more energy efficient and better for the environment – without compromising affordability. Enterprise also works with state and local governments and with Congress to develop policies that lead to more environmentally sustainable homes and communities.

Green Communities homes are built according to the Green Communities Criteria, the first national framework for environmentally sustainable affordable homes. The Criteria were developed in collaboration with and endorsed by a number of leading environmental, energy, green building, affordable housing and public health organizations.

Four years into the effort, results have exceeded expectations. To date Enterprise has invested more than $570 million to create mote than 11,000 green affordable homes in more than 250 developments in 28 states. We have trained more than 3,000 housing professionals and helped more than 20 states and cities implement greener housing policies.

Enterprise developed Green Communities because we became convinced that there were ways to create homes and communities for low-income people that saved money, conserved resources, created healthier environments and expanded access to transit and greenspace. We believed we could do better for families and communities who had typically been left out of other visions for the coming green economy.

Our inspiration was a handful of pioneering affordable housing developers such as my fellow Enterprise Community Partners Trustee Jonathan Rose, who had begun to show that affordable housing could be green. Enterprise's aim was to elevate what these leaders were showing was possible and make it mainstream. The strategies include a clear set of criteria, a comprehensive set of financial resources and technical expertise and an active engagement with policymakers as partners in creating a new approach to providing affordable homes for low-income people.

Do you know whether there are additional costs to develop sustainable and energy-efficient low-income housing?

In creating Green Communities, Enterprise sought to show that all affordable housing – new construction and rehabilitations, ownership as well as rental, large urban developments and small rural projects – could be green within the budgets and capacity of the typical affordable housing developer.

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Enterprise also intended to show that green affordable developments could be created for little if any higher development costs than conventional projects that do not offer the same benefits. And Enterprise endeavored to demonstrate the benefits of green affordable development.

The Green Communities portfolio represents virtually every form of housing in every type of climate in every kind of community in the country. New rental construction in the suburbs outside Portland, Oregon. Homeless housing on an infill site in downtown San Francisco. Single family homeownership in Blacksburg, Virginia. Senior living with services in Baltimore. Farmworker homes in rural Oregon. Historic preservation outside Chicago. Family housing in Billings, Montana. Adaptive reuse with solar power in central Los Angeles. New subdivision for-sale units in Bonita Springs, Florida. Public housing revitalization in Cleveland. Transit oriented development in Cambridge, Massachusetts.

Enterprise's extensive evaluation efforts are generating data that show that we can create highly sustainable homes for low-income families such as these for only marginally higher development costs – 2 percent to 4 percent on average, and that costs can come down with experience. Critically, Enterprise's evaluation suggests that most of the marginally higher costs are attributable to measures that generate financial savings, such as energy and water efficiency features, or enable developments to properly plan an "integrated design," which has been shown to lower costs and enhance environmental performance in buildings.

How do residents of Green Community homes benefit from the program?

Emerging data shows that Green Communities developments generate substantial cost savings from lower energy and water usage – hundreds of dollars per unit on an annual basis in many cases. These savings either accrue directly to low-income residents, or are reinvested back into properties by building owners, or both. In addition, groundbreaking research at a few Green Communities developments is starting to demonstrate significant health benefits from green affordable homes. At the High Point development in Seattle, for example, researchers are finding a dramatic decrease in unscheduled emergency room visits due to asthma and increase in asthma-free days for residents.

Residents of Green Communities developments stand to benefit in other ways as well. All Green Communities developments are required to create a guide to educate residents on how to realize the full green benefits of their homes. Owners of rental properties are also required to develop maintenance and operations plan to ensure that their buildings will remain green over time. To assist our partners in meeting these requirements, Enterprise has created a handbook on green operations and maintenance that can be customized for each building operator and a guide for low-income residents in green living.

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In implementing its state and local programs, has Enterprise discovered any regional approaches that work best for sustainable buildings or does it use a national model for its cities?

Enterprise has been fortunate to work with mayors, governors and business and community leaders on large-scale state and local green affordable initiatives across the country. The first public official with whom we formed a partnership was Mayor Newsom of San Francisco. We were honored to stand with him in 2005 when he became the first mayor in the country to commit to making all affordable housing in his city green in partnership with Enterprise. Since then, San Francisco has committed funding and created policies to achieve this goal, building on the results of Enterprise's $100 million commitment to pilot and prove out the most effective approaches for the city through a series of demonstration developments. Now we are working together to transform entire communities through the mayor's visionary HOPE SF initiative.

Another example of our approach is at the state level, with Governor Tim Pawlenty of Minnesota. Enterprise has worked with his administration, leading local foundations and the state's affordable housing industry through an ambitious effort called Minnesota Green Communities. The initiative's goal is that all new affordable homes in the state will be green by 2010 – and that goal is in sight, driven again by a growing number of Green Communities developments that are showing what is possible and by Governor Pawlenty's leadership.

We cite just these two examples to illustrate first and foremost that green affordable development is a bipartisan issue that mayors and governors across the country are beginning to advance at scale. The Green Communities national model brings a comprehensive set of resources for the purpose of catalyzing regional and local commitments and capacity.

In other words, relatively small amounts of seed funding and outside expertise can drive major progress – provided the local leadership is willing to make green affordable housing a priority. Local conditions and capacity should always drive development of the specific solutions, but national efforts – Green Communities as well as federal policies – can provide a useful framework that brings the best of what has worked elsewhere.

Enterprise has demonstrated that in every region it is possible to improve the performance of affordable housing and lower carbon emissions. The successful approach leverages national resources to expand local capacity and technical expertise, brings stakeholders together to share solutions and advocates for policies that make the development environment most conducive to green construction and rehabilitation.

How does Enterprise complement or supplement other green building standards such as LEED, Green Globes or the National Association of Home Builders Green Building Standard?

In practice, green development is not about satisfying a checklist of environmental criteria per se, but about establishing the environmental goals for a project that reflect the priorities, opportunities and challenges that its stakeholders identify. Standards and criteria have inherent limitations in such a dynamic, broad-based area as sustainable development.

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Clear, rigorous criteria are essential, however, for establishing common benchmarks of performance, ensuring depth of environmental outcomes and defining a reference point to evaluate results for policymakers, developers and capital providers. They are useful tools. We understand the Committee's interest in the issue of greenbuilding standards and its concern that "numerous definitions of green buildings can lead to confusion, inaction or ineffective policy."

We can speak most substantively about the Green Communities Criteria. The Criteria were developed in 2004, when there was no national rating system for green residential buildings and when only a handful of local green building programs addressed affordable homes in any context.

The Green Communities Criteria were developed to fill this void in the marketplace and were specifically designed to provide a workable framework for green affordable housing that was 1) holistic, encompassing smart sitting and locational elements as well as green building, operations and maintenance features; 2) applicable to the range of affordable housing developments across the country, meaning new construction and rehabilitation; for sale and rental; single- and multifamily; and 3) cost effective for most affordable housing developers to implement.

The Green Communities Criteria were developed through a consensus-based process and endorsed by a number of national organizations: Enterprise, the Natural Resources Defense Council, the American Institute of Architects, the American Planning Association, the National Center for Healthy Housing, Southface, Global Green USA, the Center for Maximum Potential Building Solutions and experts associated with the U.S. Green Building Council (USGBC).

The Green Communities Criteria reference established national standards, such as Energy Star, in most major categories. The Criteria are also aligned with the USGBC's Leadership in Energy and Environmental Design for Homes (LEED-H) national green rating system. And the Criteria are compatible, by design, with the leading local green building programs that are intended for affordable housing, such as Southface's EarthCraft Multifamily program.

The Green Communities Criteria remain the only national standard specifically designed for affordable housing that covers large as well as small buildings and new construction as well as a wide range of rehabilitation projects. Enterprise believes that the Green Communities Criteria, based on its track record in the industry, is an appropriate framework for federal policy to advance green affordable homes. Other proven, effective green building standards, specifically including LEED – H and EarthCraft Multifamily, may also be appropriate for federal policy.

Clearly, the issue of standards is important in developing federal green building policies. We urge that Congress not allow arguments about standards to distract from the task at hand, however, or divert the focus from confronting our major environmental, energy and housing challenges with the boldness and the urgency required.

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Congress can reference proven criteria that measurably improve environmental performance without limiting its flexibility or that of local communities to revise them over time or adopt more targeted solutions. For example, Congress could provide flexibility by adopting specific criteria and simply adding language that also authorizes "substantially equivalent" standards as determined by the appropriate administering agency. Congress does not even need to pick and choose among full green building programs; it could simply raise the bar by establishing targets for building performance based on widely accepted standards such as Energy Star.

At the heart of the matter is a simple question: will Congress continue to allow taxpayer funds to support design and development of affordable housing – and other types of buildings – that does not meet more demanding minimum standards for greater energy efficiency, better indoor air quality and lower carbon emissions that create higher quality homes and communities for our citizens? We believe the answer must be no. We can do better, and we must.

Experience and a growing body of evidence shows that higher thresholds appropriately implemented can directly lead to significant environmental, economic and health benefits without imposing infeasible higher costs. There may always be isolated examples – exceptions that prove the rule – that purport to show progress is not possible without tradeoffs.

Special attention should be paid to assisting smaller projects, organizations and communities with making the transition to the green, equitable economy. But no longer can we allow lowest common denominators to drive our policy. We urge the Congress to take the longer view and advance the bigger vision.

How can Congress continue to promote sustainable and energy efficient housing in the public and private sector?

Enterprise's paper *Bringing Home the Benefits of Energy Efficiency to Low-Income Households,* contains a 10-point policy platform for federal leadership with specific policy recommendations. Again, that paper is attached to this testimony for the Committee's reference. The elements of the platform are:

- Build capacity to implement low-cost improvements
- Expand and leverage financing for weatherization
- Ensure climate change legislation supports low-income home energy efficiency
- Fund the Energy Efficiency Block Grant and prioritize very low-income homes
- Invest in green jobs and prioritize homebuilding and rehabilitation
- Build on HUD pilot programs and strengthen HUD's commitment to energy efficiency
- Green the revitalization of distressed public housing communities
- Improve and expand federal energy tax credits for residential energy efficiency
- Incentivize major financial institutions to finance energy-efficient very low-income homes
- Support research and drive innovation to deepen energy efficiency

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The proposals have a relatively modest cost and could be funded without cuts to other environmental, energy and housing priorities. They are designed to support the innovation among the private sector, leading mayors and governors and professional associations that is underway all across the country but needs federal leadership to get to scale.

The recommendations build on and improve existing programs. They also include new ideas Enterprise and others have worked with Congress to develop that are moving through the legislative process. The recommendations span a number of congressional committees and federal agencies. In a sense, that is the point of our plan: a national commitment to green buildings, especially affordable homes for low-income families, requires a holistic way of thinking and a comprehensive public-private partnership.

At the project level, the essence of building green is integration – a building is understood in its totality and as a system. This "integrated design" approach has been shown to significantly lower costs and increase environmental benefits in many types of buildings. At the policy level, success too will depend on breaking down barriers between programs and agencies at all levels of government and finding common ground in creating greener homes and communities for all our citizens. This Committee can play a leading role in that effort and Enterprise looks forward to working with the Committee in any way.

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

In fact, your grandfather, James Rouse, came to Boston in the middle of the 1960s and looked at our oldest buildings—Fanueil Hall, Quincy Market—and said, "We can take those old buildings and redesign them for the 20th and the 21st century."

Mr. NORTON. He would have done them more efficiently if he had known what we know now.

The CHAIRMAN. But even with his vision, though, he did that in Baltimore. He went city after city and took the oldest structures and redesigned them for the new era. And you are here following in his footsteps, asking for us to do it once again for the 21st century, and we thank you.

Mr. NORTON. Thanks for the opportunity.

The CHAIRMAN. Our next witness, Michelle Moore, is senior vice president of policy and market development of the U.S. Green Building Council. This council develops the LEED standard, one of the most popular green building certification programs in the country.

We welcome you, Ms. Moore. Whenever you are ready, please begin.

STATEMENT OF MICHELLE MOORE

Ms. MOORE. Thank you very much. And thank you so much not only for giving us the opportunity to address you here today with so many colleagues and leaders from around the world on this topic, but also for your explicitly stated intent to raise the level of awareness of green buildings as a source of solutions for climate change, for energy and a myriad of other issues.

As Americans, we spend 90 percent of our time indoors. Our buildings have an extraordinary, if little understood, impact on our health and well-being. And there are so many issues that they are able to help us address.

So, to begin with, just a little bit about the U.S. Green Building Council. We are a 501(c)(3) nonprofit organization. We have been in existence for about 15 years. And USGBC's mission is the market transformation of the built environment to sustainability. And that concept of market transformation is extraordinarily important in understanding the intent and, really, the uses of the LEED green building rating system, which many of the other speakers here today have referenced.

Our membership is composed of, to date, about 16,000 organizational members. So those are companies, educational institutions and governmental agencies who are a part not only of USGBC as an organization but who also participate in the consensus process that develops and advances the LEED rating system.

Our vision in creating LEED and our intent in its use is that it would set a high bar, challenge the leaders and innovators in the marketplace to achieve it, and, in doing so, gradually raise the floor of the industry.

Now, in the climate in which we currently exist, obviously the U.S. Green Building Council feels a tremendous sense of urgency associated with energy and climate, again, like so many of the colleagues on the panel here today. And that sense of urgency is expressed in our work.

And if you had an opportunity to read the written testimony that I shared, there has been extraordinary growth in the green building marketplace, certainly over the course of the past 8 years since the introduction of the LEED green building rating system.

USGBC's growth is a reasonable proxy for understanding how the market has been pacing forward, by every measure, by registered and certified buildings, membership in USGBC, or LEED-accredited professionals in the community. So these are professionals from the engineering community, from the architectural community who have committed themselves to greener buildings. It has been doubling at the rate of about 50—well, every 2 years, doubling every 2 years, growing at a rate of 50 percent a year, which is good, but it is not enough in terms of what we need to achieve in a very short period of time.

Other statistics in terms of market growth that I think are important to understand are that McGraw-Hill projects that by the year 2010 there will be about a $60 billion marketplace for green building products and services. So all of the projections that we have heard about the potential for green job creation, for driving tremendous innovation and entrepreneurialism in our economy around the building sector, which is 14.7 of U.S. GDP and generates 9 million American jobs, are coming true today.

But the single greatest obstacle to that is the perception that, to do something good, to do something better, to do something that is better for the environment, it is going to cost you a pound of flesh.

And if you look at some of the research that has come out, even over the course of the past year, about perceptions of green building, while there is an increasing understanding that, indeed, it does save money, and if there is a first-cost premium associated with building green—and the research out there right now says that that first-cost premium typically stands at 1.5 percent of total cost—it is paid back within the first year just based on utility savings. But the challenge is that the vast majority of the population, even in professional communities, overestimate that first-cost premium by more than 300 percent. So it is a mindset that needs to be transformed through demonstration, through research, through case histories, that could make a tremendous impact in accelerating change.

Most of what we have talked about here today so far have been new buildings, you know, how to really change the impact of new structures that are being built today in America—homes, schools, commercial buildings, governmental buildings—can make. We would put forth that the single greatest opportunity that we have is with our existing building stock. It is 90 percent of the opportunity, quite literally.

And a recent McKinsey study that was published put forth that it was a negative cost, which I guess means a profitable opportunity for CO_2 emissions reductions—negative cost is kind of a funny way to say that. We can actually make money and generate jobs and generate economic opportunity by investing in the buildings that we already have. That is true in the commercial space, and that is true in the residential space as well.

It is not as sexy as solar panels. And it takes a lot of additional training, you know, people whose skills we don't have today, but

it is an enormous opportunity. We have done some initial calculations, and it suggests that 1.2 million jobs could be generated by a complete commitment.

I would like to close just by offering one additional important focus, and it is a focus that Congresswoman Solis brought up early on, and that is our schools. In the commercial marketplace, our schools are the single largest market sector. It is a $37 billion marketplace this year alone. And 20 percent of America goes to school every day.

Congress has taken a leadership position on this with the Green Schools Caucus, which many members of this committee have joined as well. But it is an extraordinary opportunity not only to dramatically reduce CO_2 emissions, dramatically reduce energy consumption, but, to Edward Norton's point, demonstrate in very concrete terms to the next generation that we have a real commitment to a more sustainable future.

Thank you.

[The statement of Ms. Moore follows:]

STATEMENT OF MICHELLE MOORE
OF THE U.S. GREEN BUILDING COUNCIL

BEFORE
THE HOUSE SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING

ON
BUILDING GREEN, SAVING GREEN: CONSTRUCTING SUSTAINABLE AND ENERGY-EFFICIENT BUILDINGS

MAY 12, 2008

I would like to begin by expressing our appreciation for the opportunity to speak to you about green buildings and about the role that the U.S. Green Building Council (USBGC) and its LEED Green Building Rating System have played in catalyzing market transformation in the building sector. On behalf of our more than 15,000 organizational members and more than 70 local Chapters, we commend Chairman Markey and Ranking Member Sensenbrenner for convening this important hearing.

My name is Michelle Moore, and it is my honor to represent USGBC as its Senior Vice President of Policy and Public Affairs.

The Impact of the Built Environment

Buildings are an essential part of the solution to the energy, resource, and climate issues our country is facing.

Buildings in America typically have a lifespan of 50 to 100 years, throughout which they continually consume energy, water, and natural resources. Buildings are responsible for 39% of U.S. CO_2 emissions per year.[1] If the U.S. built half of its new commercial buildings to use 50% less energy, it would save more than 6 million metric tons of CO_2 annually for the entire life of the buildings—the equivalent of taking more than 1 million cars off the road every year.

In addition, buildings annually account for 39% of U.S. primary energy use;[2] use 12.2% of all potable water or 15 trillion gallons per year;[3] and consume 40% of raw materials globally (3 billion tons annually).[4] The EPA estimates that 136 million tons of building-related construction and demolition debris are generated in the U.S. in a single year.[5] (By way of comparison, the U.S. creates 209.7 million tons of municipal solid waste per year.[6])

Moreover, Americans spend 90% of their time indoors.[7] Buildings have a profound, if little understood, impact on our health and well-being as individuals.

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[1] *EIA Annual Energy Review 2005. U.S. Energy Information Administration, U.S. Department of Energy.*
[2] *2003 U.S. DOE Buildings Energy Data Book.*
[3] *U.S. Geological Service, 1995 data.*
[4] *Lenssen and Roodman, 1995, "Worldwatch Paper 124: A Building Revolution: How Ecology and Health Concerns are Transforming Construction," Worldwatch Institute.*
[5] *U.S. EPA Characterization of Construction and Demolition Debris in the United States, 1997 Update.*
[6] *U.S. EPA Characterization of Municipal Solid Waste in the United States, 1997 Update. Report No. EPA530-R-98-007.*
[7] U.S. Environmental Protection Agency.

By addressing the whole building, from construction materials to cleaning supplies, green buildings generate opportunities to reduce emissions and environmental impact throughout the supply chain and the complete building lifecycle. For instance, 65% of the credits in the LEED Rating System reduce the CO_2 footprint of the building. Green buildings create powerful opportunities to mitigate climate change, enabling:

- reduced energy consumption through the use of energy-efficient heating and cooling systems, renewable power, and building commissioning
- reduced water consumption through the use of low-flow fixtures and appliances, and the on-site treatment of storm water
- reduced waste and improved environmental performance through the use of salvaged, recycled, and local materials, and through the development of plans for managing construction waste
- reduced emissions and environmental impact by promoting the location of facilities near public transportation, the use of hybrid or electric cars, and the use of alternative means of transportation, such as bicycles and walking

The Green Building Movement and the Marketplace

The building design and construction industry – which represents 14.2% of U.S. GDP[8] and generates 9 million American jobs[9] – has been voluntarily leading a green revolution that has begun to visibly transform our cities and towns.

McGraw-Hill projects that, by 2010, the market for green building products and services in the residential and commercial construction sectors will top $58 billion,[10] representing 770% growth over just five years.

Speaking as a professional who has worked in the building sector for more than a decade, the building industry itself is a somewhat unlikely candidate to be among the leading pioneers – if not *the* leader – of a green economy. The building industry is probably the second oldest industry in the world, and it's one of its largest and most conservative. Moreover, the complexities of its supply chain and project timelines, and the lifecycle of a building once

[8] *2006 DOE Buildings Energy Data Book.*
[9] Real Estate Roundtable.
[10] *McGraw-Hill Construction Analytics, SmartMarket Trends Report 2008.*

completed, create extraordinary challenges to driving sustained innovation towards a holistically-defined goal: sustainability.

While holding up the health and well-being of our natural environment is a goal unto itself that's been beautifully expressed by the likes of Walt Whitman in his words, and by President Theodore Roosevelt in his conservationist policies, since the early days of our Republic – it was just a little more than 10 years ago that a small group of leaders raised the challenge of sustainability specifically in the context of the built environment.

To name a few:

- Ray Anderson, the founder of Interface Inc. (a carpet company!), put forth the mission of becoming the world's first sustainable corporation. As someone who knows far too much about carpet, having worked for Interface myself, it's no easy task to undertake the work of closing the loop of a project that comes out of a carrel of crude oil. But that's exactly what Interface has undertaken to do.
- Paul Hawken, in Natural Capitalism: Creating the Next Industrial Revolution, showed us that capitalism can save the world by authoring the definitive work on how to profitably marry social and environmental goals with economic success; and drew a roadmap to sustained growth and innovation for those who've chosen to follow his advice.
- William McDonough pioneered sustainable design in architecture, and challenged us to think in terms of "cradle to cradle" instead of "cradle to grave" in the field of industrial design so that one processes waste could become "food" for another.
- Bob Berkebile together with his colleagues on the AIA Committee for the Environment, indelibly placed sustainability on our Nation's design agenda.

At the time, apart from conferences and other events that convened these thinkers and the several collaborations that they undertook together, there were precious few opportunities for the ideas and practices they were developing to take hold in the marketplace at large.

Taken from the perspective of a "technology adoption curve," green building innovation was happening on the bleeding edge, but the experience of the mainstream with it was limited to the occasional magazine article.

Enter David Gottfried, a real estate developer from Washington DC, who had the foresight and vision to convene the green building movement under one big tent: the U.S. Green Building Council.

The Origins of USGBC

The U.S. Green Building Council was founded 15 years ago this year in order to lead the market transformation of the building industry toward sustainability.

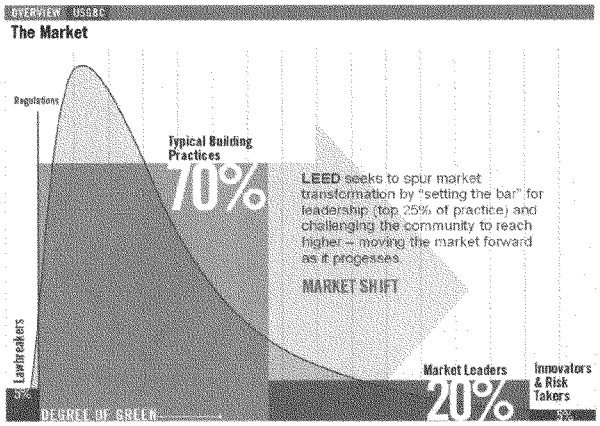
A membership organization dedicated to consensus from its very beginnings, David Gottfried and co-founders Rick Fedrizzi – then of UTC Carrier Corporation – and Mike Italiano – a DC environmental attorney – focused USGBC's first efforts on recruiting the leading innovators from every sector of the building community to join USGBC. Convening representatives from product manufacturers, architectural firms, engineers, general contractors, building owners and developers, universities, governmental agencies, school districts, financial institutions, insurance companies, environmental nonprofits and others was an essential first step towards creating a leadership organization that could reasonably undertake to fulfill the mission of market transformation towards sustainability.

The second question USGBC faced was "what is a green building?" And thus was created the LEED Green Building Rating System.

The Development of LEED

LEED was developed by USGBC in order to provide a measurable consensus definition of **l**eadership in **e**nergy and **e**nvironmental **d**esign to the building community. It is the organization's chief tool towards its mission of market transformation: LEED seeks to set a high bar, challenges market leaders to meet it, builds momentum for best practices, and moves the whole of the market forward as those best practices are mainstreamed by market forces.

Back to the technology adoption curve analogy, technologies and best practices are developed and scaled up by market leaders seeking LEED certification. As the technologies reach scale, and as best practices are propagated through the building industry's rich commitment to continuing education, prices drop and ideas enter the mainstream.



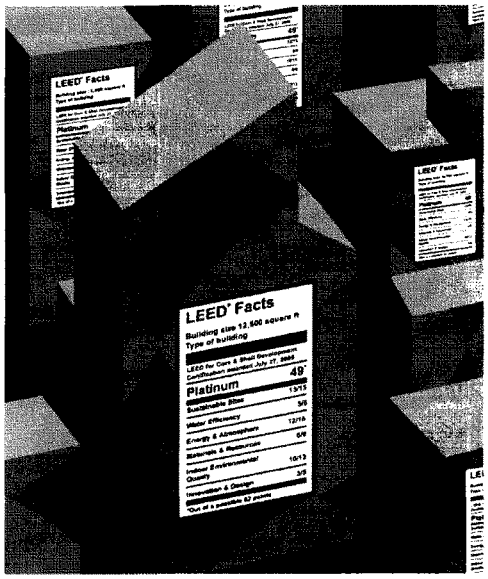
Openness, Transparency, Consensus

LEED is developed through consensus by balanced and diverse volunteer committees composed of elected leaders from among USGBC's membership. USGBC is an ANSI-accredited standards developer, and LEED is an exemplar of participatory democracy at work.

The key elements of the process, which USGBC has refined over more than a decade of leadership experience, include a balanced and transparent committee structure; Technical Advisory Groups to ensure scientific consistency and rigor; opportunities for stakeholder comment and review; member ballot of new rating systems and substantive improvements to existing rating systems; and a fair and open appeals process. Details about the LEED development process are publicly available on the USGBC Web site, www.usgbc.org, in the "LEED Foundations Documents," which describe with great specificity the consensus process.

Third-Party Certification

"If you can't measure it, you can't manage it."



USGBC is dedicated to third-party certification and as such requires technically rigorous documentation that includes information such as project drawings and renderings, product manufacturer specifications, energy calculations, and actual utility bills.

When a project commits to use LEED, the project team "registers" online with USGBC, a step which gives them access to a comprehensive online system that guides them through the certification process. The result is like a nutrition label for use by building owners and occupants.

All certification submittals are audited by third-party reviewers. The certification process – from the submittal of documentation through the final certification – takes 30-90 days.

Continuous Improvement

USGBC's mission is market transformation to sustainability, and LEED is a tool for market transformation, with that LEED must be continuously improved – seeking to make obsolete its greatest triumphs.

Since its initial public launch in 2001, LEED has completed a series of improvement cycles that have included technical innovation such as:

- Progressively strengthened energy efficiency requirements.
- More stringent water efficiency requirements.
- An online system for documentation and submittals towards certification.
- New rating systems to address existing building operation and maintenance, K-12 schools, healthcare facilities, retail facilities, commercial interior projects, core and shell developments, and homes.

- A rating system in pilot to address neighborhood-scale developments, which is being created in partnership with NRDC and the Congress for the New Urbanism.

The next major update of LEED is currently in development and will be released for its first "public comment" period on May 19, 2008. Proposed enhancements to LEED include:

- Improved energy and CO2 emissions reduction performance: increased "weightings" on energy, transit-oriented location, and water efficiency.
- Environmental performance of building materials: LCA (life cycle assessment) methodology for materials and resources credits.
- Regionally-specific credits: Buildings need to respond to different bioregional environments, so LEED is introducing specific "credits" to differentiate building performance requirements in diverse locations.

R&D

Underpinning LEED's continuous improvement process are hundreds of volunteer leaders representing thought leadership from across the building industry. These volunteer leaders give of their time an expertise on consensus committees that drive the technical development of the rating system forward.

USGBC also undertakes an intensive R&D effort to drive LEED's technical development forward. Examples of R&D projects undertaken in the past year include:

- A USGBC/CTG Energetics study on sources of building CO2 emissions, metrics and measurement, and mitigation strategies utilizing LEED.
- A Yale School of Forestry study on forest certification systems.
- A New Buildings Institute study on energy efficiency performance in LEED certified buildings.

How LEED Works

LEED is a voluntary third party certification system for green building, and was developed to promote leadership in the building industry by providing an objective, verifiable definition of "green." LEED is a flexible tool that can be applied to any building type and any building lifecycle phase, including new commercial construction; existing building operations and maintenance; interior renovations; speculative development; commercial interiors; homes; neighborhoods; schools; health care facilities; labs; and retail establishments.

LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas, with an additional category to recognize innovation: sustainable site development, water savings, energy efficiency, materials and resources and indoor environmental quality. Each category includes certain minimum requirements ("prerequisites") that all projects must meet, followed by additional credits that are earned by incorporating green design and construction techniques. Four progressive levels of LEED certification – Certified, Silver, Gold and Platinum – are awarded based on the number of credits achieved. USGBC provides independent, third-party verification to ensure a building meets these high performance standards.

Originally developed for new commercial construction projects, LEED has been expanded in recent years to respond to market demand for additional tools to address different building types and lifecycle phases. USGBC released rating systems for the operations and maintenance and commercial interiors markets in 2006, for the schools sector in 2007, and for the residential market earlier this year. These programs are already gaining traction in the market. About 500 builders representing 10,000 homes participated in the pilot test of LEED for Homes, and more than 650 homes have been certified to date.

Moreover, USGBC is now pilot-testing and nearing completion of rating systems for neighborhood developments, healthcare facilities, retail spaces, labs, and campuses.

In 2006, the U.S. General Services Administration (GSA) submitted a report to Congress evaluating the applicability, stability, objectivity, and availability of five different sustainable building rating systems.[11] Based on this study, GSA concluded that LEED is the "most appropriate and credible" of the available rating systems for evaluating GSA projects.[12] GSA currently requires its new buildings and substantial renovations to achieve LEED certification.[13]

Why LEED Works

From USGBC's perspective, LEED is working for the following reasons:

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[11] Pacific Northwest National Laboratory (operated for the U.S. Department of Energy by Battelle), *Sustainable Building Rating Systems Summary* (July 2006), completed for General Services Administration under Contract DE-AC05-76RL061830, *available at https://www.usgbc.org/ShowFile.aspx?DocumentID=1915.*

[12] Letter dated Sept. 15, 2006 from GSA Administrator Lurita Doan to Sen. Christopher Bond, Chairman, Subcommittee on Transportation, Treasury, the Judiciary, HUD, and Related Agencies, Committee on Appropriations (accompanying report), *available at https://www.usgbc.org/ShowFile.aspx?DocumentID=1916.* .

[13] U.S. General Services Administration, Sustainable Design Program, *available at* http://www.gsa.gov/Portal/gsa/ep/channelView.do?pageTypeId=8195&channelPage=%252Fep%252Fchannel%252Fgsa Overview.jsp&channelId=-12894

- **Immediate and Measurable:** LEED requires measurable results, and it gives any user the tools they need to begin making better building decisions tomorrow.
- **The Business Case:** USGBC has, from the beginning, focused on building the business case to demonstrate beyond the shadow of a doubt that doing Good makes economic sense. Sustainability is a three-legged stool by definition – environment, equity, and economy – so it stands to reason.
- **Transparent and Inclusive:** USGBC makes decisions about the technical development of the rating system by engaging the best minds in the green building community through volunteer committees, and engages the whole of the community through an open and transparent consensus process.
- **Independent:** USGBC as an organization is 97% earned income driven. Our financial and governance models ensure that no single interest can dominate the process.
- **Educational Capacity:** USGBC doesn't just administer LEED. USGBC trains more than 50,000 professionals and emerging green builders per year on how to build green.
- **Continuous Improvement:** We embrace both evolutionary and revolutionary change in green building practices.

Costs and Benefits of LEED

In a follow-up study released in July 2007 updating its 2004 analysis of the cost of green building, Davis Langdon concluded that "there is no significant difference in average costs for green buildings as compared to non-green buildings."[14] An earlier study conducted by Capital E in 2003 found that the cost premium for using LEED on a project averages about 2%.[15] The report estimated that the financial benefits of green buildings are ten times greater than this average cost premium.[16]

Harvard Business Review cites the DPR building in Sacramento, California as having invested 1.4% upfront additional costs to implement green measures. The project is expected to more than make up the investment by generating over $400,000 in operations savings.

Moreover, LEED buildings are becoming prized assets in the real estate community. A recent study by the CoStar Group of more than 1,300 LEED and Energy Star buildings in the group's commercial property database

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[14] Davis Langdon, *Cost of Green Revisited: Reexamining the Feasibility and Cost Impact of Sustainable Design in the Light of Increased Market Adoption* (July 2007), *available at http://www.davislangdon.com/upload/images/publications/USA/The%20Cost%20of%20Green%20Revisited.pdf; see also Costing Green: A Comprehensive Cost Database and Budget Methodology* (July 2004), *available at http://www.usgbc.org/Docs/Resources/Cost_of_Green_Full.pdf.*

[15] Greg Kats, Capital E, *The Costs and Financial Benefits of Green Buildings: A Report to California's Sustainable Building Task Force* (October 2003), *available at https://www.usgbc.org/ShowFile.aspx?DocumentID=1992.*

[16] *Id.*

reported that LEED buildings command rent premiums of $11.24 per square foot more than their non-LEED peers and have occupancy rates that are 3.8 percent higher.[17] The study further reports that LEED buildings command a sales premium of an impressive $171 more per square foot.[18]

In the residential marketplace, LEED for Homes just debuted nationally in December 2007, so there is not yet sufficient operating data on green homes to make a comprehensive assessment of first costs and operating savings. Anecdotal evidence and case histories suggest additional first costs beginning at about $1000 depending on geographic market, home size, and level of LEED (Certified, Silver, Gold or Platinum).

Please see the attached "Project Profiles" for additional examples.

Market Adoption of LEED

More than 3.6 billion square feet of commercial real estate is currently registered or certified under the LEED Green Building Rating System, inclusive of more than 11,000 individual building projects, and more than 12,000 housing units are registered or certified under the system.

In addition, USGBC is currently working with 26 market leaders as a part of a comprehensive pilot to incorporate green building practices across entire building portfolios. Pilot participants include American University, Bank of America, California State University – Los Angeles, Cushman & Wakefield, Emory University, HSBC, N.A., PNC Bank, State of CA – Dept. of General Services, Syracuse University, Thomas Properties Group, Transwestern, UC – Merced, UC – Santa Barbara, University of Florida, and USAA Real Estate Company.

It's incredibly important to understand, however, that 3.6 billion square feet represents about one out of every ten new buildings. So it's a good start, but it's not enough to turn the tide on the built environment's CO2 emissions footprint – not yet.

Please see the attached document, "LEED Facts," for further details.

Governmental Adoption of LEED

Governments at all levels have been highly influential in the growth of green building, both by requiring LEED for their own buildings and by creating incentives for LEED for the private sector. From the Department of Energy's

[17] CoStar Group, *http://www.costar.com/partners/costar-green-study.pdf.*
[18] *Id.*

support for the initial development of LEED, to the Energy Independence and Security Act of 2007 (EISA), to the many cities and states that have adopted LEED, the public sector has demonstrated considerable vision and leadership in the transformation of the built environment. Currently, 12 federal agencies or departments, 28 states, 120+ local governments,12 public school jurisdictions and 36 higher education institutions have made policy commitments to use or encourage LEED.

The U.S. Department of Energy enabled the initial development of LEED with a $500,000 grant in 1997, and has also provided USGBC with $130,000 in grants to support the early formation of the Greenbuild International Conference and Expo. Staff from the national laboratories, FEMP and other agency programs have actively shared their expertise to develop and refine LEED. USGBC has also collaborated with DOE's Office of Energy Efficiency and Renewable Energy, and BuildingGreen on the High Performance Buildings Database.

The U.S. General Services Administration—which is the nation's largest landlord—requires its new buildings and major renovation projects to achieve LEED certification. GSA submitted a report by request of Congress that found that LEED "continues to be the most appropriate and credible sustainable building rating system available for evaluation of GSA projects."[19] In particular, GSA noted that LEED "[i]s applicable to all GSA project types; [t]racks the quantifiable aspects of sustainable design and building performance; [i]s verified by trained professionals; [h]as a well-defined system for incorporating updates; and [i]s the most widely used rating system in the U.S. market."[20]

USGBC commends the federal government for its leadership in advancing green building through its inclusion of several new initiatives in EISA, including:

- the Office of Federal High Performance Green Buildings within GSA and the Office of High Performance Green Commercial Buildings in DOE to coordinate green building research, information dissemination and other activities;

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[19] Letter dated Sept. 15, 2006 from GSA Administrator Lurita Doan to Sen. Christopher Bond, Chairman, Subcommittee on Transportation, Treasury, the Judiciary, HUD, and Related Agencies, Committee on Appropriations (accompanying report), *available at https://www.usgbc.org/ShowFile.aspx?DocumentID=1916; see also* Pacific Northwest National Laboratory (operated for the U.S. Department of Energy by Battelle), *Sustainable Building Rating Systems Summary* (July 2006), completed for General Services Administration under Contract DE-AC05-76RL061830, *available at https://www.usgbc.org/ShowFile.aspx?DocumentID=1915.*

[20] Letter dated Sept. 15, 2006 from GSA Administrator Lurita Doan to Sen. Christopher Bond, Chairman, Subcommittee on Transportation, Treasury, the Judiciary, HUD, and Related Agencies, Committee on Appropriations (accompanying report), *available at https://www.usgbc.org/ShowFile.aspx?DocumentID=1916.*

- the recently authorized energy efficiency and conservation block grant program to support states and local governments in reducing greenhouse gas emissions, reducing energy use, and improving energy efficiency; and

- the authorization of funding for a grant program for school environmental health programs and a study of indoor environmental quality in K-12 schools.

We support the robust funding of these initiatives as a means of spurring market transformation and encourage the federal government to continue its work to lead by example in the greening of the built environment.

Please see the attached "LEED Initiatives in Government" for further details.

Congressional Leadership: Green High Performance Schools
In the U.S., more than 55 million students and more than 5 million faculty, staff, and administrators spend their days in school buildings. These buildings represent the largest construction sector in the U.S.—$80 billion in 2006-2008[21] –which means that greening school buildings is a significant opportunity to make a major impact on human, environmental, and economic health.

Most importantly, children in green schools are healthier and more productive. Design features--including attention to acoustical and visual quality, daylighting, and color--have a profound impact on children's ability to learn. Green schools also have superior indoor air quality and thermal comfort, and expose children to fewer chemicals and environmental toxins—which has been linked to lower asthma rates, fewer allergies, and reduced sick days.[22]

Green schools cost less to operate and greatly reduce water and energy use, which generates significant financial savings. According to a recent study by Capital E, if all new school construction and school renovations went green starting today, energy savings alone would total $20 billion over the next 10 years. On average, a green school saves $100,000 per year—enough to hire two new teachers, buy 250 new computers, or purchase 5000 new textbooks. The minimal increase in upfront costs—on average less than $3 per square foot–is paid back in the first year of operations based on energy savings alone.

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[21] Christopher Klein, ed., The 2005-2008 K-12 School Market for Design and Construction Firms.
[22] *See* Gregory Kats, Capital E, *Greening America's Schools: Costs and Benefits (2006), available at http://www.usgbc.org/ShowFile.aspx?DocumentID=2908.*

USGBC applauds the commitment of the House of Representatives to supporting this critical work and commends Representatives Hooley, Matheson and McCaul for their leadership in forming the Green Schools Caucus. To date, the Caucus has more than 30 members who are committed to advancing the mission of green schools.

We are similarly encouraged by the House Education and Labor Committee's recent passage of H.R. 3021--the 21st Century High-Performing Public School Facilities Act. This bill, which represents a significant investment in green school construction, enables improvements that maximize taxpayer dollars, decrease demand on municipal infrastructure, protect the environment, and put money back into the classrooms.

A Green Building Research Agenda

In a March 2007 report, USGBC found that research related to high-performance green building practices and technologies amounts to only 0.2% of all federally funded research.[23] At an average of $193 million per year from 2002 to 2005, research spending is equal to just 0.02% of the estimated value of annual U.S. building construction.[24] These funding levels are not commensurate with the level of impact that the built environment has on our nation's economy, environment and quality of life.

USGBC supports the direction of critical research funding to principal program areas, including: Life Cycle Assessment of Construction Materials; Building Envelope and HVAC Strategies; Lighting Quality; Transportation-Related Impacts of Buildings; Performance Metrics and Evaluation; Information Technology and Design Process Innovation; Indoor Environmental Quality; and Potable Water Use Reduction in Buildings.[25]

Market Transformation = Education

LEED is one of many tools and programs USGBC has created to advance its mission of market transformation.

Chief among these are our educational programs. USGBC has trained more than 80,000 professionals through its green building workshops, and has attracted more than 66,000 attendees from around the globe to its annual Greenbuild conference.

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[23] U.S. Green Building Council, *Green Building Research Funding: An Assessment of Current Activity in the United States* (March 2007), *available at http://www.usgbc.org/ShowFile.aspx?DocumentID=2465.*

[24] *Id.*

[25] *See* U.S. Green Building Council Research Committee, *A National Green Building Research Agenda* (Nov. 2007; revised Feb. 2008), *available at http://www.usgbc.org/ShowFile.aspx?DocumentID=3402.*

Educational programs are delivered locally through USGBC's more than 70 Chapters and Affiliates (one in a community near you), through the Web, and at conferences and events all over the world.

The difference between catastrophe and hope is education, and USGBC will continue to dedicate itself to working independently and in partnership with peers and colleagues throughout the industry to advance the practice of green building.

About USGBC

The U.S. Green Building Council (USGBC) is a 501c3 nonprofit membership organization with a vision of sustainable buildings and communities within a generation. Our more than 15,000 member organizations and 91,000 active volunteers include leading corporations and real estate developers, architects, engineers, builders, schools and universities, nonprofits, trade associations and government agencies at the federal, state and local levels.

The organization is governed by a diverse, 31-member Board of Directors that is elected by the USGBC membership. Volunteer committees representing users, service providers, manufacturers, and other stakeholders steward and develop all USGBC programs, including the LEED rating system, through well-documented consensus processes. More than seventy local USGBC Chapters and Affiliates throughout the U.S. provide educational programming to local communities.

A staff of more than 135 professionals administers an extensive roster of educational and informational programs that support the LEED Rating System in addition to broad-based support of green building. USGBC's LEED Professional Accreditation program, workshops, green building publications, and the annual Greenbuild conference provide green building education for professionals and consumers worldwide.

The CHAIRMAN. Thank you, Ms. Moore, very much.

And our final witness is Tony Stall, who is the vice president of marketing for Dryvit Systems, Incorporated. Dryvit is a Rhode Island-based company that has been building exterior insulation and finishing systems for over 30 years. This Outsulation offers improved insulation and energy efficiency benefits.

We welcome you, Mr. Stall. Whenever you are ready, please begin.

STATEMENT OF TONY STALL

Mr. STALL. Thank you, sir.

Before I begin, I would like to thank Mr. Norton for, as he wondered aloud if he was the youngest member at the table, you did glance in my direction. [Laughter.]

And I know you were looking at Ms. Moore, but I am flattered by that, as well as flattered to be in your presence and included among you. So thank you.

And thank you, Mr. Chairman and Ranking Member Sensenbrenner, for the opportunity to address this committee on the issue of energy efficiency in construction and strategies to reduce carbon dioxide emissions, both of which are inherent benefits of the exterior cladding system manufactured by my company.

I would also like to offer special thanks to Congressman Sullivan, who last year visited our Oklahoma office and greatly impressed me with his sincere interest in both our company as well as the contributions our products can make toward improving the environment and, importantly, our national energy security. Thank you.

Headquartered in West Warwick, Rhode Island, Dryvit also owns manufacturing facilities in Georgia, Oklahoma and California, as well as in Poland, China and Canada. Our parent company, RPM, is a publicly traded American company which owns major construction-related brands, such as DAP, Rustoleum, Zinsser and Tremco. Seventy-five percent of Dryvit's business is in the United States, on new construction as well as in the renovation of older structures.

Ours is not a new or unproven technology. In 1969, we brought the concept of a highly energy-efficient exterior cladding system to the United States. This system, as its name, Outsulation, suggests, is uniquely defined by the placement of the insulating component of the system on the exterior of the wall. That is where building science has proven it to be most effective.

Dryvit Outsulation Systems have been used on over 400,000 structures in North America. A vast majority of the Nation's architects and general contractors have specified and used Dryvit claddings over the past 40 years, in both private- and public-sector construction, residential and commercial, in all 50 States as well as around the world.

Dryvit Outsulation Systems have been a popular choice for building owners because they are design-flexible, durable, cost-efficient, and, most effective, more energy efficient than any other common exterior cladding system available today.

This energy efficiency is validated by the Oak Ridge National Laboratories, which evaluated seven common cladding systems: brick, stucco, glass, concrete, wood, masonry, and the Dryvit Outsulation System. Their findings are extremely compelling: Our

system tested 84 percent more energy-efficient than next-best, 84 percent. What does that translate into for the building owner? An average energy savings of between 20 and 30 percent. That is a significant benefit and one that can contribute enormously to meeting our national energy policy objectives.

Approximately 80 percent of buildings and virtually all those built prior to 1970 are more poorly insulated than required by current building codes. That is a significant problem when you consider that the USGBC asserts that more than 40 percent of all energy used in the United States is used to heat, cool and operate buildings.

Developing cost-effective energy-efficient strategies for both new and existing buildings are of the highest national priority. We can immediately and meaningfully reduce our dependence on foreign, nonrenewable energy sources by raising standards for the energy efficiency of all types of buildings.

Importantly, such policies need not be more expensive to building owners, residential or commercial. While precise costs are variable to geography and project conditions, Dryvit Outsulation Systems are a cost-effective method of achieving greater energy efficiency.

In a case study developed by a Nashville architect, 10 percent of the shell construction costs on a typical three-story office building were saved by substituting our Outsulation Systems for masonry. This amounted to $570,000 in savings on a $5 million shell, a savings in concrete, steel, cladding, and HVAC systems.

Energy savings, however, are only half the story. The other half involves our carbon footprint. We have always known that Outsulation Systems reduce energy use.

What we did not know and needed to find out was whether the energy needed to create, transport, and recycle our products was greater or less than the energy saved by using them. To determine this, we turned to the National Institute of Standards and Technology, a division of the U.S. Commerce Department. NIST conducted a full 50-year lifecycle analysis, cradle to grave, of all Outsulation system components, including the expanded polystyrene insulation. In nearly every category considered by NIST, the Outsulation systems were superior to all other tested claddings. Put it in terms we can all understand, Outsulation systems produced an overall lifecycle carbon footprint more than seven times smaller than brick and five sometimes smaller than stucco.

The CHAIRMAN. If you could conclude, please.

Mr. STALL. I would like to conclude, Mr. Chairman, by thanking you and your colleagues again for your time and the opportunity to share this vitally important information with you. Cladding systems that place insulation on the outside of the wall have been proven by independent U.S. Government agencies to be significantly more energy efficient, and leave a significantly smaller carbon footprint than those that do not.

With that in mind, I encourage you to strongly consider both simplifying existing guidelines as well as recommending additional legislation which will provide incentives to building owners that choose to invest in building technologies that have already been proven to significantly improve energy efficiency and reduce carbon emissions. Current technology can accomplish these goals. Building

green with the right mix of products does not have to cost more. It is responsible economic and environmental policy to encourage the use of these technologies to every possible extent. Thank you.

[The statement of Mr. Stall follows:]

Testimony to Select Committee on Energy Independence and Global Warming
Testimony of Tony Stall, Dryvit Systems, Inc.
14 May 2008
Washington, D.C.

Thank you, Mr. Chairman for the opportunity to address this committee on the issues of energy efficiency and strategies to reduce carbon emissions – both inherent benefits of the exterior cladding system my company manufactures - that can have a meaningful and measurable impact on non-renewable energy consumption as well as the reduction of carbon dioxide emissions. I would like to offer a special thanks to Congressman Sullivan, who last year visited our Oklahoma office and impressed me with his sincere interest in both our Company as well as the contributions our product is making toward improving the environment as well as our national energy security.

Headquartered in Rhode Island, Dryvit also operates manufacturing facilities in Georgia, Oklahoma and California, as well as in Poland, China and Canada. Our parent company, RPM, Inc. of Medina, Ohio, is a $3.6 billion dollar, publicly traded American company which also owns major brands such as DAP, Rust-oleum, Zinsser, Tremco and DayGlo paint. 75% of Dryvit's business is in the United States, in both commercial and residential, new construction as well as renovation of older buildings.

Ours is not a new or unproven technology. In 1969, Dryvit brought the concept of a lightweight and highly flexible exterior cladding system to the United States from Germany, where it was invented after WW 2 and is still widely used today. That system, branded by Dryvit as "Outsulation", is uniquely defined by the placement of expanded polystyrene insulation on the exterior of the building, where building science has proven it to be most effective. Chairman Markey, in your state of Massachusetts, the Building Code affirms this by requiring insulation on the exterior of structures that use steel stud construction. It is my understanding that other states are considering similar measures. What these regulations prescribe is the exact concept offered by Dryvit Outsulation systems. Dryvit Outsulation Systems have been used on more than 400,000 buildings in North America. A vast majority of the nation's architects and general contractors have specified and used Dryvit claddings over the past 40 years, in both private and public sector construction, in all 50 states. In fact, it would not be exaggerating to state that every person in this room here today has shopped in a store, enjoyed a sporting event, slept in a hotel, eaten in a restaurant, took a class, received medical care, or worked in an office building clad with a Dryvit Outsulation, or similar System.

The reason why Dryvit Outsulation Systems have been a popular choice for both private and public sector building owners – both residentially and commercially – is because they are attractive, cost effective, and just happen to be more energy efficient than any other common exterior cladding choice available.

Hard to believe? Consider this: The Oak Ridge National Laboratory evaluated seven common cladding systems – brick, stucco, glass curtain wall, concrete, wood and masonry - alongside Dryvit's Outsulation system. Their conclusion is compelling: The 2" thick Dryvit Outsulation system scored a whole wall R value of 12.7 which was 84% more energy efficient than the next-best performing cladding. The most common building claddings - brick, stucco and wood siding, achieved significantly lower energy ratings – less than half those of Outsulation. What does 84% more energy efficiency translate into for building owners? - an average annual energy savings of between 20 and 30%. By any measure, that is a significant benefit and one that would contribute mightily to meeting our national energy policy objectives.

What this means, of course, is the vast majority of our nation's buildings are clad with exterior systems that are demonstrably poorer energy performers. That is a significant problem when you consider that the Unites States Green Building Council asserts that more than 40% of all energy used in the United States is used to heat, cool and operate buildings – residential and commercial structures combined. At the same time, it is estimated that over 80% of all structures built prior to 1960 used "substandard" insulation – which means less than is now minimally required by Code. Clearly, finding more energy efficient building solutions is our highest national energy priority. We can immediately and

meaningfully reduce our national dependence on foreign, non-renewable energy sources by raising standards for the energy efficiency of all types of buildings.

Importantly, such a policy need not cost building owners – residential or commercial – more money. Greater energy efficiency is an inherent benefit of the Outsulation System. While precise costs are variable to geography and project conditions, Dryvit Outsulation systems are cost effective alternatives to other common claddings. A case study developed by a major Nashville architect determined that 10% of the shell construction costs on a "typical" commercial office building could be saved by substituting Dryvit's Outsulation system for masonry. In the study, over $570,000 was saved in concrete, steel, cladding and HVAC costs by building with the Outsulation system. Energy savings, however, are only half our exciting story.

The other half involves our carbon footprint. We have always known that Outsulation Systems reduced energy use. What we did not know was whether the energy needed to create our product was greater than the energy saved by using it. This is the true measure of a product's "greenness". Here, we turned to the National Institute of Standards and Technology, a division of the US Commerce Department. NIST conducted a full Life Cycle Analysis – cradle to grave - of the Outsulation system components, including the expanded polystyrene. By every measure conducted by NIST – global warming impact, Acidification, Criteria Air Pollutants, Ecological Toxicity, Embodied Energy, Eutrophication, and Fossil Fuel Depletion – Outsulation systems outperformed all

other tested claddings over the full 50 year life cycle analysis. In terms we can all understand, Outsulation systems produce a carbon footprint that is more than seven times smaller than brick and five times smaller than stucco.

The cost-effective installation of Dryvit Outsulation systems is just the beginning of a
lifetime of superior performance. Our DryvitCARE program provides guidelines for cleaning, repair, and restoration of Dryvit Outsulation systems or other similar products and will help keep their cladding looking good and performing exceptionally for the lifetime of the building. Through completion of the Platinum Warranty program, the original system warranty is repeatedly eligible for renewal.

Properly maintained under the provisions of DryvitCARE, Dryvit Outsulation systems will not need to be removed, recycled or put into a landfill – although I hasten to add that the components, including the expanded polystyrene insulating layer, are all recyclable, environmentally inert materials. They will remain useful—saving energy and helping protect our environment—for the lifetime of the building.

I would like to conclude, Mr. Chairman, by thanking you and your colleagues again for your time and the opportunity to share this important information with you. Cladding systems that feature insulation on the outside of the wall assembly, such as the Dryvit Outsulation system, are proven by independent

government agencies to be significantly more energy efficient and produce a meaningfully smaller carbon footprint than cladding systems that do not feature insulation on the exterior of the wall assembly.

I fully recognize that your charge as a committee is to investigate, study, make findings, and develop recommendations on policies, strategies, technologies and other innovations intended to reduce the dependence of the United States on foreign sources of energy and achieve substantial and permanent reductions in emissions and other activities that contribute to climate change and global warming. To that end, I would encourage you to strongly consider recommending additional legislation and simplifying existing regulations providing subsidies and other incentives to building owners choosing to invest in building technologies that have been proven to significantly improve energy efficiency and lower carbon emissions. Building technologies exist today that can accomplish those goals without adding costs to achieve them. Building green, with the right mix of products, does not have to cost more. It is responsible environmental and economic policy to encourage the use of these technologies to every possible extent.

Thank you again, Mr. Chairman, for the honor of addressing you and your committee on this vital topic. I would be pleased to answer any questions the committee might have at this time.

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

The Chair will now recognize himself for a round of questions. And again, my mother always used to say, Eddie, you have got to learn how to work smarter, not harder. And she would always say that immediately before she said that she was going to donate my brain to Harvard Medical School as a completely unused human organ. But, essentially, her message was, let's just be more efficient. Think smarter here. Why waste energy, money, time when you can be smarter?

So, Mayor Newsom, you heard the debate here. Let's just leave the private sector go and do it. You don't need any regulations. You don't need any government intrusion. Now, if you had not acted, Mr. Mayor, what had been the case before you had put all of these new codes and regulations on the books?

Mr. NEWSOM. I appreciate the spirit of the debate, and I appreciate the question. And the reality is they just simply weren't doing it. They were constructing to old standards. The designers and architects weren't working together, weren't coordinating, weren't collaborating. Engineers were in a silo. And folks just weren't focused on it. In fact, a lot of developers, they are not operating or managing the buildings. They are just happy to get a product up and gone, and then some new independent manager comes in, and they just pass through the energy costs to the businesses. So the fact is there was really no incentive.

So when you get everybody in the same room and you start creating some rationale on these things and explaining those costs, and the fact they are going to be borne down the line, and be borne in ways that are actually not economic stimulus, meaning they are going to actually hurt our economic output and the economy, then folks start saying, well, wait a second. You are telling me 1 percent, 2 percent. I have stats. We have a new study came out zero to 2 percent, meaning de minimis. Some as high as 2 to 4 percent. The reality is there is not much of a cost differential. It is the quality of imagination. That is all that's missing here. Common sense. As you say, work smarter, not harder. So the fact is, as we push people together, as we force them to think differently, they are acting differently, and they are happy to do it.

Private sector is a hundred percent on board. And we have some of the exact same developers in every one of your towns that say you know what, we get it. And we get it because we have a better product that we can insure for less money, operate for less money, get better workforce by getting better businesses here. It is a win-win.

The CHAIRMAN. Thank you, Mr. Mayor.

Mr. Norton, when people think about low-income housing, they say, well, let's kind of spend less money on it, and it won't be some big luxury home. But how can you make something efficient with green technologies if you can't spend money on it? What is the rationale? Can you explain it to the committee so people can understand why it makes sense to make these low-income units green?

Mr. NORTON. Well, there are lots of easy ways to make low income green. And in a strange way, low-income development, good low-income development, has always been more efficient in the sense that most good nonprofit community development of housing

has involved efficiency training anyway for the economic reason that the people in the lowest income brackets need the most relief from the high nut of home energy use and things like that. That is increasingly true as energy costs rise. Obviously, people in the lowest income levels are suffering disproportionately from increasing energy costs.

But to your point, efficiency, there are lots of ways to make a home more efficient that are not high cost premium items, from the materials that are used to the efficient appliances, the Energy Star appliances that are coming on line, and frankly just training people. Someone mentioned it, many people just aren't aware how they are using energy in their home. They are aware what their car mileage is but not how they are using energy in their home.

But, as Mayor Newsom was saying, we are finding, in the affordable housing context, it is the same. There are a lot of the same misperceptions that the various things that go into making the footprint more efficient have a high-cost premium on them. And we are finding also that it is in the 1 to 3 percent range and, as I mentioned, tends to drop with the learning curve. I think it is one of the most salient points; I heard three different people say it, the bottom line, the impact on the bottom line argument is based on a lot of outdated information I think. The assumption that these techniques carry a high-cost premium is sort of a canard at this point that shouldn't be indulged too much longer.

The CHAIRMAN. Let me ask one final question on my round. And that would be to Mr. Peterson, Ms. Moore, and Mr. Stall.

You heard Mayor Newsom talk about his regulations and how it telescoped the timeframe to get the real benefits. And then once everyone was in, they realized they were benefitting from it. Do you think that it is good to have regulations on the books that then everyone understands? Does that help to accomplish these goals, or should we just leave it wide open to every single citizen of our country and private sector individual to move forward on their own pace?

Are regulations necessary, Mr. Peterson?

Mr. PETERSON. I believe that regulations offer the ability to set goals for people in our industry. And as we talked about with green buildings, we are changing the way that we design and construct buildings.

The CHAIRMAN. So the answer is yes.

Mr. PETERSON. The answer is, it will accelerate the marketplace by setting regulations.

The CHAIRMAN. Thank you.

And ultimately help, not hurt those who are affected by the regulations.

Mr. PETERSON. That is correct.

The CHAIRMAN. Ms. Moore.

Ms. MOORE. The consensus process that Mayor Newsom described I think is extraordinarily important.

The CHAIRMAN. But then the consensus has to be made the regulation. You agree with that?

Ms. MOORE. Consensus has to drive local decisions.

The CHAIRMAN. Okay. Great.

Mr. Stall, would your company be better off if we had a national standard that everyone had to meet? How wealthy would you become and how fast?

Mr. STALL. First of all, there are many standards that apply to exterior cladding systems such as we make. I mean, the code testing that is required to become compliant——

The CHAIRMAN. Is that good?

Mr. STALL. I believe that is very good, because it acts on public safety.

The CHAIRMAN. Good. That is all I need to hear.

My time has expired. Let me turn and recognize the gentleman from Oklahoma, Mr. Sullivan.

Mr. SULLIVAN. Thank you, Mr. Chairman.

Mayor, I was going to ask, you said a lot of good things, what about like low income people that their houses aren't very efficient, do you have any innovative programs to address how they can afford to maybe update their homes?

Mr. NEWSOM. Yeah, we are very proud, we have a Power Savers Program. We have other programs with our utility, PG&E, Pacific Gas and Electric, and our California Public Utilities Commission, which have been remarkable partners that go in doing energy audits in low-income communities primarily as well as small businesses. And we have all kinds of grants that are provided by the private sector that basically make it de minimis again. The cost is pretty negligible to retrofit. So we, as a consequence, have been fortunate enough that we have done so much on CFLs that we are now restricting certain types of CFLs. So we are moving beyond the incandescent-compressed fluorescent debate to what kinds of CFLs we are using by eliminating T–12s and requiring now T–8s and moving toward LEDs.

But the point I really want to underscore is Ed's point, the issue of environmental justice and the fact that the environmental movement in this country looks a lot like us, and the fact that four out of five toxic waste dumps in this country are in African-American communities. And here we are subsidizing $4 billion a year in HUD for utilities. I mean, the idea that Republicans, not just least of which Democrats, would sport with these increased utility costs; that kind of subsidy is beyond me. It puts pressure on municipal government, puts pressure on Federal and State government to increase taxes. And that is why I think the issue of particularly linking these requirements that focus on your question of how we can address low-income communities and how we can insulate, literally and figuratively, the costs that would otherwise be borne by people on fixed income by investing up front in quality construction I think is self-evident. I think it is an easy question to answer.

Mr. SULLIVAN. Are people taking advantage of it now?

Mr. NEWSOM. Unbelievably so. And it is something we market consistently. And we are very proud of the programs. Yes.

Mr. SULLIVAN. And Mr. Peterson, and I guess Ms. Moore, does your organization support any mandates, I guess national, State or local, for the LEED rating system or certification program?

Mr. PETERSON. I will speak, obviously first, for my organization. My organization actually writes most of the standards. They are consensus-based standards by which the LEED rating system is

modeled after. And so we write the energy efficiency standards for buildings. We are working with the United States Green Building Council with a new high-performance green building standard that could be a standard adopted by local jurisdictions for minimum requirements for green buildings also.

Ms. MOORE. From our perspective, as I mentioned earlier, LEED was developed as a voluntary rating system for green buildings. And in many leadership-oriented communities, like San Francisco, they have made a decision to move from incentives-based programs like permitting, which is low or no cost for the city and puts a lot of money back in the developers' pockets to create that reason to go green, to a community consensus-based decision to adopt LEED across the board. Now a couple of years ago when USGBC decided to partner with ASHRAE to create Standard 189, we did so explicitly because we thought the market was at a place at which there needed to be that minimum standard that could set the level floor for the level of green building achievement that any commercial construction should be able to hit. And I believe that that standard will be completed and available in the marketplace sometime early next year.

Mr. SULLIVAN. And, Mr. Stall, did you bring a piece of Dryvit with you?

Mr. STALL. I did not, sir. I am sorry.

Mr. SULLIVAN. I was just going to ask if you could, let's say I have an old house and I want to save on my electric bill, heating, cooling my home, it is a typical wood, I guess, house, how would your product be applied to it? What would you do? And just how much would it cost for I guess just a small house to have that done?

Mr. STALL. Well, costs are of course variable according to the job.

Mr. SULLIVAN. Sure.

Mr. STALL. You are looking at an average of probably between $5 and $10 a square foot, depending upon the design you ultimately wanted. You may be doing other things to your home, such as changing windows, improving the sealants that may be old and may need remodeling. You may be changing your roof. You are probably going to involve an architect. If all you wanted to do was add Outsulation to the exterior of the home, you would need only contact Dryvit to start the process. And we would have a trained applicator out there looking at what needed to be done and coming up with a quote and——

Mr. SULLIVAN. Just putting that on, though, that would be significant, just applying that to the outside of the home, wouldn't it?

Mr. STALL. It would probably be, for a couple of thousand square feet on the exterior of a home, it would probably take a couple of weeks to do. Not a complicated process.

Mr. SULLIVAN. And how is it applied to let's say a house? You have the wood. Does the wood have to be taken off or——

Mr. STALL. Typically, the cladding, the exterior cladding, would be removed down to the substrate, which would likely be plywood or OSB. And then the expanded polystyrene insulation board would be attached directly to the plywood.

Mr. SULLIVAN. It is a neat product. I think it is a wonderful innovation. I appreciate you being here.

Mr. STALL. Chairman, if I might, you asked a question about——

The CHAIRMAN. The gentleman's time has expired. The gentleman's time has expired.

But you should be proud, Mr. Stall, because on C-SPAN you just had the first commercial infomercial in C-SPAN history. So you should be happy right where you are right now.

Let me turn here and recognize the gentleman from Oregon, Mr. Blumenauer.

Mr. BLUMENAUER. Political infomercials don't count.

I appreciate the testimony here talking about the impacts. I think the reference several of you made to $4 billion that the Federal Government is currently spending on utilities, I am very interested in the thoughts that you have about how we would redirect this, how we get the people to have government leading by example to actually bring this to pass. Any thoughts and observations?

Mr. NORTON. Well, there is a forthcoming piece of legislation from Representative Perlmutter, I believe——

Mr. BLUMENAUER. Right.

Mr. NORTON [continuing]. That is entitled the Green Resources for Energy Efficient Neighborhoods Act, which is an attempt to just basically legislate that HUD can incorporate environmental priorities into its various programs. For starters, just to have HUD actually——

Mr. BLUMENAUER. You would rather have us change that to "should" or "will."

Mr. NORTON. Yeah, I would.

Mr. BLUMENAUER. Is there any reason that we don't mandate that?

Mr. NEWSOM. I am at a complete loss. I mean, if the idea is to reduce the costs of government, and here you have one of the easiest ways to reduce the cost of government, and everyone says, my gosh, this is very challenging and difficult. I mean, this is simple. You know, with all due respect, I am dumbfounded and at a complete loss when we are down at the local level where we can do it in dysfunctional cities like San Francisco.

Mr. BLUMENAUER. Your words, not mine.

I appreciate, Mr. Norton, your referencing that bill. I think we are ready to introduce it this next week. And I think Mr. Perlmutter and Mr. Hodes have done a great job. I am planning on being an original cosponsor of it.

This notion, though, of having a mandate, none of you would object to mandating the Federal Government have the highest standards?

Ms. MOORE. Congressman Blumenauer, if I might add, there are about a dozen Federal agencies that have taken very far forward leadership positions today in green building practices. It hasn't been adopted across all Federal buildings obviously, but the Department of Energy, for instance, was one of the earliest investors in the development of the LEED rating system, and helped to advance it. And GSA is doing extraordinary work as well that is exemplary.

Mr. BLUMENAUER. I guess what drives me crazy, I am as incredulous as some of our witnesses, I have been in Congress 13 years; we have been having these conversations. We still don't have a uni-

form policy. The Federal Government is the largest consumer of energy in the world. We are not setting the bar very high. And it frustrates me. One other area, you mentioned issues that deal with low-income consumers. And I appreciate you referenced Mr. Rose, who was part of a panel we had last week here.

Mr. NORTON. You are talking about Jonathan Rose, who is also on our board. Yeah.

Mr. BLUMENAUER. Jonathan Rose does a great job on your board. We have got people back home that are committed to actually having buildings that generate more energy than they use, that use more waste than they produce. So we know kind of what to do with it. Is there an opportunity to go to the private sector in terms of the private utilities that are trying to figure out how to use, how to meet the needs that are coming down the line, and give them a higher rate of return on projects, insulation, swapping out hot water heaters? And nobody in America should have an electric hot water heater bubbling away while they are not home, for instance. Is there a role for the regulatory process with utilities themselves to accelerate, to jump-start this?

Mr. PETERSON. Utilities play a very important part in actually implementing these strategies. Especially in my home State of California, as the mayor would tell you and he did actually indicate, utility companies need to understand that energy efficiency is the first measure in providing return to their investors. And in many States, as I travel across the United States, many States have not understood that business model yet.

Mr. BLUMENAUER. I guess my question is, shouldn't we be pushing to make that a part of the State regulatory framework and maybe have some FERC incentives?

Mr. PETERSON. I believe that we need to mimic some of the lessons that have been learned in the State of California and some of the other States with respect to the public utilities on what energy efficiency offers for the return on investment of those investors in those utilities.

Mr. NEWSOM. And California is a great example, where we are incentivizing our public—through the California Public Utilities Commission, is incentivizing utilities like Pacific Gas and Electric to do the right thing. They make money by doing the right thing. And it is an extraordinary successful model.

Mr. BLUMENAUER. I see my time is wrapping up. Could I leave a question for you to ponder and perhaps share with us at a later date? I mentioned the location efficiency. We are having a problem where some of the most desirable, from a transit perspective, is the most expensive. Some of the cheapest housing is the most expensive for transportation. And it drives the greenhouse gas footprint. Any thoughts or reflections that you or your organizations have about ways that we might incent location efficiency to supplement what you are doing would be welcome.

The CHAIRMAN. And if you could provide that in writing to the committee from your organizations, we would very much appreciate that.

The gentleman's time has expired.

The Chair recognizes the gentlelady from California, Ms. Solis.

Ms. SOLIS. Thank you. And I apologize for having to step out earlier. I didn't hear all the testimony. But I am sure—my staff tells me it was very much on target.

I am concerned about the issue regarding environmental justice communities, and the fact when we talk about the environment and the greening, it very much looks like this room. It doesn't reflect many of the communities that some of the Members of Congress represent. And how do we incentivize our partners who want to get involved in the greening of the environment and our buildings? What kinds of things or action can the Federal Government take to help build that ability to have a workforce?

And Mrs. Moore, if you could answer, and also the mayor.

Ms. MOORE. The focus on investing in green job skills training is extraordinarily important. The statistic I mentioned earlier, that 100 percent commitment to energy efficiency in building could drive more than a million green jobs. The skills that are needed to retrofit our buildings, the skills that are needed to retrofit our homes for energy efficiency aren't necessarily present in the workforce today. You know, any of us who live in Washington D.C., if we wanted to do a deep energy retrofit on our houses, market price, affordable or otherwise, good luck finding someone you could call to help you do that. There are some wonderful programs out there that begin to provide benchmarks, like Energy Star performance for homes that even work for existing structures.

But in making an investment in the workforce, and for those of us who represent the nonprofit community, cultivating stronger partnerships with trade unions and with other organizations that represent the workforce that stands to benefit from this is very, very high on our agenda, as well as partnerships with Enterprise Community Partners and others who help bring affordability to the agenda. Because I think that we would all agree that we can't afford as a society to allow living in a green home or working in a green office to be eco-bling.

Mr. NEWSOM. Well, this is the great opportunity, is to lock people into the green sustainable economy that have been locked out of the old industrial age economy and really focus on the issue of environmental justice in the context of looking at its racial implications, and taking advantage of the opportunity to look at your Federal workforce dollars and your workforce training dollars in a way that advances that and focuses on underserved communities and focuses on the creation of these jobs that are jobs that were wisely stated earlier that can't be outsourced. These are the jobs that need real bodies to do real work within the community.

I will just give you a brief example in San Francisco. We have a solar incentive program. We actually have a solar incentive program that will provide up to $6,000, just a cash rebate. That assumes, though, that the individual that wants to put solar on their roof gets—rather uses resources from the city and invests it back in through an organization that does workforce training targeted within ZIP codes in our city that are in underserved communities. You get only $3,000 if you don't. Meaning we are actually putting real money up. We will double the incentive if you go through workforce training programs within the city and county of San Francisco in underserved communities.

So there are all kinds of ways to create incentives that create market decisions that are in line with I think the broad ideology here represented in Congress.

Ms. SOLIS. Are any other cities doing that of, say, your size?

Mr. NEWSOM. None. In fact, we very notably are proud that we are taking the lead on this. But there are hybrids of it all across the country, Portland of course being one of the most progressive and extraordinary examples, but in smaller ways. San Francisco will be the first to do that.

Another thing I also think is important, we are about to replace our payroll tax with a carbon tax. We will be the first city in the United States to do that. Which gets into that whole issue of all those buildings we are not talking about. And we are looking to address some of the issues of inequality, looking at more grandfathering. We don't want to burden people on fixed income with an increase in their utility users tax or businesses in turn. And so we are looking at very progressive grant funds as well and other incentives that would lock into some of the points in question that you were mentioning earlier.

Ms. SOLIS. Just one comment if anyone wants to comment on the notion of trying to create some kind of a carbon tax fund, investment fund that could then be made available to low-income communities or areas that are blighted or could be identified as green zones. Is there any talk about that out there in the private sector world?

Mr. NEWSOM. That is literally what we have done. When I say ZIP codes, we have created zones on the basis of ZIP Codes and on the basis of asthma rates and all other kinds of indices that we have determined. One of the exciting things——

Ms. SOLIS. Do you think the Federal Government should consider that?

Mr. NEWSOM. Absolutely. Yes. I will leave it at that.

Ms. SOLIS. Quickly, quickly, because my time is running out.

Mr. NORTON. Certainly. We feel very strongly that Enterprise did some of the—you know, we are exploring extensively the way that these investments, these initial investments in greening affordable housing will actually pay dividends, real dividends in the sense that, as the carbon economy becomes more defined, there might be quite a bit of revenue available to the nonprofits, the community development corporations, things like that available, you know, to come back to them out of the carbon economy in terms of carbon credits and things like that. So, literally, not just in terms of, is there a cost premium on it, but that there actually might be a return on investment over time because, you know, the carbon trading is here. And we are already figuring out ways for the low-income development community to tap that as a source of revenue.

The CHAIRMAN. The gentlelady's time has expired.

The Chair recognizes the gentleman from Washington State, Mr. Inslee.

Mr. INSLEE. Thank you. I was struck by Mr. Norton's request for a challenge, you know, from Washington D.C., and his regretting the fact that a bunch of old guys are still running this joint. You know, and I just want to assure him we got guys, you know, Eddie Markey pushing 90, he has got some good ideas. Earl Blumenauer,

the leader of transportation and planning pushing, you know, 80, and he has still got good ideas. So you are seeing some challenges here.

Mr. NORTON. You need to get a microphone.

Mr. INSLEE. Yeah.

I just wondered what is the best way to frame that challenge? You know, I was struck by your language saying we need a challenge that will challenge people to the better angels of their nature to rise to this new enterprise. What is best way to talk about that? And the reason I ask you is, I have talked about it, and some people have criticized me the way I talk about it. I talk about we got to recreate the Apollo project. Americans still have the right stuff. This is for America to fulfill its destiny.

And some people say, no, no, you should talk in some terms about sacrifice, that somehow we have to sacrifice. That should be part of the language. I just wondered, you are a master of the popular culture, what do you think is the right way to talk about this revolution?

Mr. NORTON. I am glad you brought that up. It does strike me, listening to the appropriate debate about the cost-benefit analysis and what is the best instrument of these changes, is it the free market, that part of what in my mind, without being an alarmist, what breaks the validity of that debate down is to some degree the environment of crisis that we are facing. I mean, this country has done what it needed to do historically when it faced crisis. And the question that—you know, the question that was put to the forefront was not in those scenarios, you know, well, should the market handle this or not. You know, we didn't ask if the market would handle—the market created the Depression. We didn't look to the market, the free market to fix, you know, the country in the crisis of the Depression. We didn't look to the free market to figure out how to take on the challenge of—a global challenge like World War II. This country has many times in its history acknowledged that it needed to meet a challenge that the free market was not the best instrument of for that.

And I think, you know, you reference Lincoln and the better angels of our nature. I think that, in those moments, I think that people, you know, young people—my father still talks about being a sophomore in college and hearing Kennedy say the phrase, "ask not what your country can do for you but what you can do for your country." Nobody is saying things like that to us. They are just not, not in a meaningful way. I think they are not calling—you know, people my age and younger I think look at government these days as an argument between parties as opposed to a conversation about the country. And I think that a framing, a framing context, framing this as an epochal challenge, saying this is what your grandchildren and their grandchildren are going to remember this era for, how you stood up and faced this problem, is inspiring. We want to be inspired. We want to be inspired by language that—and when you reference the Apollo project or something like that, I think that, at core, I do think that is a part of it. I think it is about leadership creating a narrative really for people, a narrative that gives them something to engage in, a role that they can play in a collective agenda.

And I think you talk about the popular culture, the downside of it is the fragmentation of our popular culture, our national culture. It is a function of our diversity. But what we are missing, I think what we have been missing for a long time is that narrative that unites us in a sense of common purpose.

Mr. INSLEE. There are a couple books that I think fulfill that. I will give one of them after this hearing is over.

But one other quick question, as far as greening the as-built environment, one of the great challenge is financing this. You know, everybody can save energy if they will put a few grand down to green their house, their as-built house. But getting that financing is a real issue. And it seems to me that we need some structure of an industry who will essentially assume your energy ownership of your home that will in fact put up the capital, do the improvements, and have the homeowner pay what they would have paid otherwise, less some money for their savings over time to a company that has assumed the risks for the energy costs. That doesn't really exist right now. Can it? Should it? What do we do to get that type of structure just in 30 seconds?

Ms. MOORE. Two quick things. One, there is some wonderful models that are working. In California, of course, for on bill financing for home energy efficiency improvements. And in the commercial sector, ESCOs, Energy Service Companies, that effectively finance investment today based upon recapturing the energy savings tomorrow are both models that are replicable. They are just not implemented in a very large scale today.

Mr. INSLEE. I will work on that.

Thank you.

The CHAIRMAN. The gentleman's time has expired.

The Chair recognizes the gentleman from Missouri, Mr. Cleaver.

Mr. CLEAVER. Thank you, Mr. Chairman.

My concern is whether or not the poorest people are going to also be the last people to benefit by the higher level of consciousness surrounding—around the environment. I grew up 300 yards maybe from the landfill and from the waste treatment plant. I was in—I did my annual examination 2 months ago, and I was scared to death that, when the doctor called me in afterwards to tell me I had little scratches on my lungs, that he was going to say that I did in fact have some form of cancer, which I think has devastated my high school class.

But we have a difficult job to do. And I am interested in your response to this, because I think we are going to need your help. Dan Quayle, former Vice President, had a grandfather who was a United Methodist minister. He was a master of elocution. He was a fabulous person. Mr. Quayle got things mixed up sometimes. And on one occasion, as he was trying to quote the theme of the United Negro College Fund, he said, "a mind is a terrible thing to lose." And I agree with him. He was trying to say, "a mind is a terrible thing to waste." But I think a crisis is a terrible thing to waste. And I think we are in the middle of a crisis. And I really don't want to waste it.

I think it is a time that we can create consciousness about what is happening in the urban core, with people still today living close to landfills, living close to waste treatment plants.

And the other part of it is there are 20,000 foreclosures a week in the United States, 20,000. And one of the things that I have been hoping for and talking about is that if we pass—well, actually, the Senate has a bill it is struggling with now with FHA, but if we are going to have legislation that would make it more possible for FHA to come in and save homes that are in foreclosure and reduce interest rates and so forth, that maybe we ought to have another opportunity or requirement that we do some kind of weatherization. Because even if they save their home, even if we are helpful in saving their homes, Mr. Mayor, the other problem is they live in the oldest part of the city; they are going to still end up paying more money out even if you save your home. You are still going to be paying out more money because you are poorer than people who are living in an affluent area.

And I guess this is more of a plea. We need some preachers, you know, people who are going out, talking and getting across the reality of what we are facing in this country.

Mr. NEWSOM. It is faith and works. You need preachers and people to take that passion, twin it with some action and demonstrate it.

Look, I think what Ed is doing with Enterprise is extraordinary. And this legislation is incredibly principled in terms of linking Federal dollars to public housing, HOPE VI in particular, to these green building standards. If no place else, we should establish some framework of some minimum standards with some local autonomy and some flexibility perhaps.

Mr. CLEAVER. We did do that on the Hope VI Program in New Orleans and Mississippi.

Mr. NEWSOM. Perfect model then.

Mr. CLEAVER. We are requiring that all of those one-for-one replacements are in fact green construction.

Mr. NEWSOM. And then twin it with workforce training dollars to get those residents working on rebuilding their own homes in their home communities. And I think that is then how you begin to reconcile some of these issues, address some of the institutional issues and generational issues in a meaningful way. But I appreciate your passion. And I know that Ed and others, I think everyone on this dais shares those same passions.

Mr. NORTON. I think you are getting into something that is definitely a strong point in our position paper that we have submitted to you, is that apart from bold, bold ideas, you know, paradigm-shifting ideas, there is so much in the public sector that you could do to easily just align existing incentives with these goals. And if you were to do nothing else, you could have your staff go back, pour through what already exists, what the government is already doing and bring the standards a little bit more in line with these things. It would be an incredibly effective way just to begin.

The CHAIRMAN. Okay. The gentleman's time has expired.

Mr. CLEAVER. Thank you, Mr. Chair.

The CHAIRMAN. And all time has expired because there are a number of roll calls on the House floor. So we will have to end the hearing.

Here is how I would like to end the hearing. I would like each one of our witnesses to give us their 1-minute concluding state-

ment, what you want us to remember. We are going to go in reverse order that we started with. And while you are thinking about that, I also want to thank Ann Blackwell and Design Within Reach for their three green chairs here. It is a start. Okay.

We will begin here and try to do it for—do you want to come out here so we can recognize you, Ann, for your work? Thank you so much. We appreciate this precedent-setting set of chairs that we are using here today.

So let's begin with you, Mr. Stall. You have 1 minute.

Mr. STALL. Thank you, Mr. Chairman.

I didn't get to comment on public policy, so now is my chance. When shopping for a car last week, I was offered a $2,400 tax credit for buying a Nissan Altima hybrid. I would save approximately $400 worth of gas a year by driving that car. You offer currently a homeowner $300 on the old energy tax credit for making energy conservation improvements to his home. By using exterior insulation, he can reduce his energy bills by 20 to 30 percent per year, which in my State of Rhode Island, my heating oil costs of $8,000 per year would be roughly $2,000. I get a $300 tax credit to save $2,000 a year. If I buy a car that saves $400 a year, I get a $2,400 tax credit.

Change it.

The CHAIRMAN. Thank you, Mr. Stall.

Ms. Moore.

Ms. MOORE. Given all the conversation around the room today, particularly about issues related to social justice, social equity, I would urge all of you and everyone in the room to remember green schools is a critical priority. There is no reason that today in America that every school being built shouldn't be green. And that every school that exists shouldn't be greened as well. Because, as Congressman Cleaver mentioned, his high school class has been decimated by lung cancer and other kinds of environmental issues. And this is a solution that we can bring today. The technology exists today, and it does not cost more for a healthier future.

The CHAIRMAN. Mr. Norton.

Mr. NORTON. I think that it is terrific that you are focusing, within the context of the overall energy and global warming crisis, on the built environment. That is, I think, underappreciated as one of the core sources of these problems. I think, from Enterprise's perspective, we would like to add emphasis to not forgetting about the affordable housing development community within that built environment. Many, many people don't think that the affordable housing equation can support the same standards and practices that are going on in the commercial building environment, and they absolutely can. And so, as you look at it, don't forget about affordable.

And in a much broader sense, as Congressman Cleaver said, please don't squander the opportunity of the crisis. I think, don't be afraid to frame these challenges in the kinds of, not panicky, but epochal term terms that they deserve. There is not a lot of time all the best minds are telling us. And I think for people of my generation, we want to hear it framed as a national challenge. We want to hear it invoked as something that needs to become a national priority.

The CHAIRMAN. Thank you, Mr. Norton.

Mr. Peterson.

Mr. PETERSON. Energy availability and climate change are a crisis, a crisis that is starting to grow year by year as we start to move forward. I would ask the panel to consider, as we move forward, what type of leadership we can provide in the United States, leadership that provides and frames what that cause would be for Americans, leadership that also shows what the challenges will be, leadership that includes vision, vision that goes out at least 20 years. Where will we be as a Nation and what type of immediate action can we start to take in order to lead this country towards energy independence and reduction in carbon emissions?

The CHAIRMAN. Thank you.

Mr. NEWSOM. Chairman Markey, entire committee, thank you. You give me optimism and hope. And I mean that with sincerity. It is not a throw-away line. And all I can say is please LEED by example. And what I mean by lead is not l-e-a-d. In this case L-E-E-D. At least create some framework for Federal taxpayers' dollars to do the right thing and begin to substantively address by example these issues and address the issue of environmental justice. There is nobility in that cause. And that is exactly the kind of leadership that you can do in the short run that will make a huge difference in the long run.

The CHAIRMAN. Thank you, Mayor Newsom, very much.

We thank each of you.

And as we were at this hearing today, Secretary of Interior Kempthorne just announced that he is listing the polar bear as a threatened species under the Endangered Species Act, which sounds great.

But then, he also announced that he is using a loophole so that he has to do exactly nothing to help the polar bear in its now newly established endangered species position. Not exactly a conversion on the road to Damascus, but consistent with this administration's policies of preaching temperance from a barstool. You cannot have a beer in your hand as you tell the kids it is really bad for them. You can't have a cigar in your mouth as you say smoking is bad for you. And you can't be out there preaching while at the same time saying there is no role for the government. Okay.

And so what we learned here today is that if the government sets the standards, then the private sector will show up.

Mr. Stall will get even exponentially richer than he is already. And that is a good thing, because the private sector will then compete to solve the problem. And that is really what today is all about. It is this sense of community that the United States has to have to solve the problem.

This has been one of the most important hearings we will have during this first 2 years of the Select Committee on Energy Independence and Global Warming. We thank you all so much. This hearing is adjourned.

[Whereupon, at 3:46 p.m., the committee was adjourned.]

HON. GAVIN NEWSOM
RESPONSES TO WRITTEN QUESTIONS
FROM THE SELECT COMMITTEE ON
ENERGY INDEPENDENCE AND GLOBAL WARMING

1. *According to calculations done by Environmental Building News, commuting by office workers accounts for 30% more energy than the building itself uses. We need to think not just about energy efficiency, but about location efficiency – ensuring buildings are located in a place where people have transportation alternatives and access to services. In an era of high and rising gas prices, location efficiency is extremely important for low income families, who spend a significant amount of their income on transportation costs. Transportation costs currently account for 18% of the average U.S. household expenditures. By some estimates, the savings associated with living in a location efficient area can exceed $600 a month. How can we incorporate location efficiency into the standards that the US Green Buildings Council and Enterprise have created? Is this something we can take beyond just a few additional points of credit and consider in the underlying standards?*

   Environmental impacts from transportation, particularly commuting, are indeed substantial. Our city's own analysis indicates that while local buildings are responsible for approximately 49% of the city's greenhouse gas emissions, transportation accounts for the other 51% of our greenhouse gas emissions.

   San Francisco is a dense urban environment with an extensive public transit system, so that while local transportation-based emissions represent over 50% of our total emissions, per capita transportation use and attendant climate impacts are smaller than the national average. Regardless, we are working diligently to increase non-auto transportation options and increase the residential density in San Francisco, which builds environmental sustainability in our region by locating new housing close to employment.

   The US Green Building Council (USGBC) has several Leadership in Energy and Environmental Design (LEED) Green Building Rating Systems, and each rating system recognizes the importance of development density and convenient access to transit by awarding points toward certification. The LEED rating systems are intended to be flexible, allowing projects to prioritize opportunities to improve environmental performance based on local conditions.

   Three projects in San Francisco are participating in a new pilot rating system, LEED for Neighborhood Developments (LEED-ND), which provides an independent third party benchmark for environmentally friendly neighborhoods, as opposed to individual buildings. To receive recognition through LEED-ND, the development must either be infill development, located adjacent to transit, close to a suite of neighborhood services, or enhance transportation efficiency through other means. In addition, best planning practices that promote walking and minimize automobile dependency are addressed through a variety of performance-based measures. The innovative projects participating in LEED ND in San Francisco tend to meet all of the above criteria. We consider LEED ND very promising in incorporating 'location efficiency' into the set of environmental criteria on which new developments are judged.

2. ***One area I've been involved in is location and energy efficient mortgages – getting Fannie Mae and Freddie Mac to credit mortgage applications for the savings generated by a transit-friendly location and energy efficiency, making it easier for homebuyers to buy these homes. Do you think that if Location Efficient Mortgages were more widely available and better understood that more families would take advantage of them?***

   Yes, absolutely. The Energy Efficiency Mortgage (EEM) and Location Efficient Mortgages (LEM) programs offer profound benefits for energy security and climate protection. I believe San Franciscans will utilize both programs at very high level as they are available, particularly the LEM program because of the proximity of so much of our housing stock to residents' employment locations. It simply makes economic sense to include the energy efficiency and location efficiency of a building when calculating its mortgage..

   To be most effective, all federally supported loan programs – not just FHA 203(b) loans - should provide the benefits of an EEM by default. In other words, cost-effective energy efficiency measures combined with a basic home performance test should be easily available and folded into any loan.

3. ***How can we better use the tax code to promote green buildings?***

   Most importantly, the[1] 30% tax credit for installation of solar photovoltaic systems should be extended for five years, rather than subject to annual approval, in order to provide greater financial certainty and stability for the growing renewable energy industry.

   This tax credit has contributed to dramatic growth in commercial solar energy installations, and is fundamental to the innovative financing models (power purchase agreements) that have supported that growth by reducing or eliminating up front capital investments to install renewable power on commercial buildings. Power purchase agreements represented 10% of commercial solar purchases in 2006, 50% in 2007, and are expected to top 75% in 2008, and solar energy generation capacity installed annually has more than doubled in that time. Continued development of renewable energy is essential to the energy security of San Francisco, California, and the United States.

   Second, property owners should be eligible to write off investments in exemplary green buildings at a faster pace than standard construction. Specifically, the Modified Accelerated Cost Recovery System (MACRS) bonus depreciation provided to renewable energy systems through EPAct 2005 should be expanded to allow preferential depreciation of real property assets that have been verified to provide exceptional environmental performance. This federal action would help reduce the profound environmental impacts of the built environment; support sustainable economic development; and support the development, manufacture, and installation of green technologies.

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[1] Source: Barron, Rachel (2008) "Power-Purchase Agreements to Spike" Green Tech Media, http://www.greentechmedia.com/articles/power-purchase-agreements-to-spike-591.html

4. ***Mayor Newsom described San Francisco's efforts to ensure that its governmental centers are models of sustainability. Is this something that can be replicated at the Federal government level? Do you know what the Federal government has done in this area so far and how we can go further?***
The federal government can and should play a leadership role in the prioritization of green buildings and sustainability among its building complexes.

In the development and operation of its facilities, the Federal government has made numerous substantive commitments to green its buildings and continues to take great strides to lead by example in this area.

Since commuting by office workers consumes 30% more energy than the operation of their offices, and the Federal government manages the nation's largest office portfolio, the Federal government should prioritize development of federal facilities adjacent to transit, and also consider tax incentives for the development of housing and mixed use projects within 0.25 miles of federal buildings and 0.5 miles of major public transit stops on lines which serve federal facilities. The nation's largest office portfolio would enhance the sustainability of its host communities.

However, the primary opportunity that has not yet captured by the Federal government is the commitment of substantive, ongoing resources toward the sustainability of the nation's built environment as a whole. While action to improve federal facilities in the past 15 years has been impressive, investments in renewable energy research, the efficient use of water and energy, and stewardship of natural resources have not been proportional to the challenges, or the opportunities, which we face. Specifically, the United States should expand the eligibility of sustainable transportation projects eligible for federal funding, de-emphasizing highways. Similarly, the Energy Efficiency Block Grant program should be expanded beyond a pilot to a major national initiative capture the opportunities for economic development through energy efficiency. California has been a leader in capturing these opportunities for decades, but even in California there is tremendous remaining capacity for improvement.

5. ***Do you agree that much can be done and already is being done in the area of energy efficiency without federal intervention through local and state initiatives, building codes, private enterprises and charitable groups?***

San Francisco is one of many successful examples of state & local governments taking the lead to increase energy efficiency in local buildings. Further, our collaborations with the local private sector and local community based organizations have advanced energy efficiency, renewable energy, and demand management.

Despite our success, the sum of these successful local experiments and initiatives will not result into the level of environmental progress necessary to address the environmental challenges before us. Policy leadership is required at the federal level, followed by financial resources and consistent nationwide implementation, to achieve adequate increases in energy efficiency throughout the US.

6. ***Has the EnergyStar program helped the building industry and consumers make better choices in appliances, heating and cooling systems? What other systems should also receive ratings similar to the EnergyStar program?***

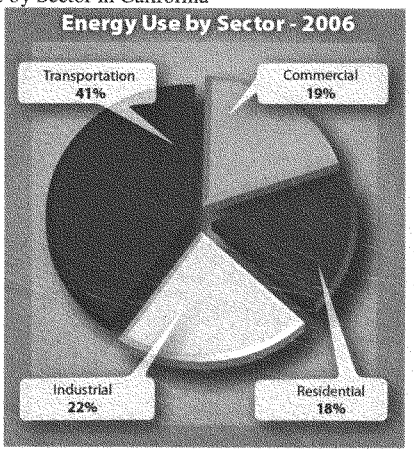
   Yes, Energy Star has had a substantial positive impact. However, to maintain its credibility the Energy Star label must continues to represent a challenging, but achievable, bar for performance. It would be beneficial for EnergyStar standards for appliances and equipment to be updated more frequently.

   The EnergyStar Benchmark, a tool to rate the energy performance of whole-buildings, is an excellent resource. Funding should be provided to expand the range of facility types eligible for the EnergyStar. For example, there is no EnergyStar Homes label for multifamily buildings greater than three stories – even though high-density development near transit is the most energy efficient. Similarly, common municipal buildings such as libraries and fire stations are not eligible.

7. ***How does the energy usage break down between industrial, commercial, and residential buildings? Which sector do you see the most potential for efficiency gains?***

   Commercial, residential, and industrial buildings use approximately equivalent amounts of energy, as shown in Figure 1 below. All sectors have substantial opportunity for continuous improvement in energy efficiency.

   Figure 1 – Energy Use by Sector in California[2]



8. ***The AIA now requires that its members take professional continuing education classes in sustainability (starting in January 2009), but many people in the building trades, from contractors to maintenance workers, still do not receive the training they need in energy***

[2] Source: California Energy Commission

efficiency. How can we better educate all the stakeholders in the building industry in how to design, construct and operate energy efficient buildings?

In San Francisco, we are working to expand numerous education opportunities for building professionals, as well as encouraging new professionals to enter the green building market.

For example, we are engaging with key stakeholders to develop specialized curriculum for community-based and City-funded construction training programs aimed at low-income people and at-risk youth. These workshops will provide fundamental knowledge of green construction, targeting the growth opportunities identified through research and policy activities. The training will help serve the increasing market demand for these services being generated through our green building and energy-efficiency policy initiatives, such as the new Green Building Ordinance, requirements of energy efficiency upgrades for existing residential and commercial buildings, and our new local Solar Energy Incentive Program.

A sampling of San Francisco's other partners in sustainability training for building trades:

- The Pacific Energy Center and the Energy Training Center, educational arms of the local utility, Pacific Gas and Electric, which deliver excellent, free training in energy efficiency to design professionals and tradespeople alike. These programs are funded through the Public Goods Charge of the California Public Utilities Commission.

- Build It Green, a Berkeley-based non-profit that promotes residential green building programs and education, partners with the Department of the Environment to host monthly networking and training events for residential building professionals, and provides continuing education opportunities for other key stakeholder groups such as Affordable Housing developers, Suppliers, Real Estate Professionals, Production Builders, as well as administering formal third-party certifications through their GreenPoint Rated Homes program.

- The local USGBC Chapter organizes ongoing seminars on relevant topics to green building professionals, and has recently partnered with the local AIA chapter and our local utility company to deliver high-level technical trainings on green design and building operations.

- The local Building Owners and Managers Association chapter (BOMA-SF) offers ongoing "webinars" to its members on energy efficiency topics, marketed through the "BEEP" Program (Building Energy Efficiency program)

- The nascent Green Plumbers program, which is delivering specialized water and energy efficiency training to the plumbing trade.

9. ***How does San Francisco's economy affect the stringency of building codes you put in place? Would your codes work in a town like Toledo, OH or Buffalo, NY?***

With preparation, particularly education of local design and construction professionals, green building does not cost more than quality standard building practices. Moreover, the construction of green buildings, which have lower operating costs and higher capital value, represent a wise investment communities make in their built assets. As a result, local economic challenges should not be a barrier to adoption of location-appropriate green building standards.

The structure of our Green Building Ordinance – a clear, achievable path to a set of sustainability benchmarks – can and should be replicated elsewhere. This adoption should occur in collaboration with the local building community and with consideration of the local industry's experience with green building practices. When recommending sustainability requirements for San Francisco, the Mayor's Green Building Task Force took into account the status of the local construction market and professional education and awareness within the local industry, as well as the use of voluntary incentives by public sector and industry leaders in San Francisco and surrounding markets. Other markets with less prior green building activity might need to phase in their programs more slowly or slightly differently. Similarly, additional adjustments may be beneficial to customize residential requirements to local climates and conservation priorities.

Lastly, multiple rating systems are available to use to set sustainability standards for buildings, which have varying levels of stringency and flexibility. While the San Francisco Green Building Ordinance references the nationally applicable LEED rating system for non-residential construction, the residential green building requirements utilize the GreenPoint Rated system that was developed specifically for California. Outside of California, the LEED for Homes or EPA Energy Star New Homes programs may be an appropriate system of standards for some communities.

10. *How do San Francisco's green building codes fit into the rules and regulations dictated due to AB32? Were any of your actions required by the passage of AB32, the California Global Warming Solutions Act?*

This ordinance is not required by AB 32. In fact, environmental targets and regulations for local governments called for in AB32 are still being developed. However, this ordinance no doubt advances the goals of AB 32 and will likely be emulated in other California cities to meet local goals that AB 32 sets for cities. Our green building ordinance actually emanates from our efforts to meet San Francisco's own greenhouse gas reduction goal set in 2004, which calls for a 20% reduction in 1990 levels of greenhouse gas emmissions by 2012.

11. ***In your testimony, you unequivocally state, "This perception that green buildings are too expensive for the mainstream has been shattered in our city and region based on the emerging experiences of developers and the cold hard facts and figures of the green building industry." If constructing environmentally friendly buildings is not too expensive and provides a return on the initial investment, why are government regulations necessary to mandate construction of green buildings? What are the drawbacks to "green" construction?***

Green building practices have suffered from a misperception that the represent 'gold plating' building construction that cost more than normal construction and is not realistic for many building uses and real estate markets. In fact, emerging studies demonstrate that this perception is based on a lack of knowledge and experience within the building industry about how to efficiently integrate sustainable design and construction practices into traditional building construction process. If appropriately planned for and integrated into the design and build process, integrating sustainability features and practices are shown to be within the price range of traditional construction. Additionally, a lack of recognition exists in the development industry about the long-term financial benefits of green buildings. Many developers are still unaware that the value of their building increases substantially based on its sustainability characteristics such as energy efficiency and natural ventilation. Green building is one of many environmental practices that make economic sense, but needs encouragement from the government to increase awareness of its benefits.

The US Green Building Council and scores of State and local programs have been formed in part to address this substantial ongoing market failure. The result has been very positive: The voluntary green building market sector has averaged over 70% of annual growth as the financial benefits of green building have become more widely known. However, since green building has been a fraction of the overall construction market (2% of new U.S. nonresidential construction in 2004, according to McGraw-Hill Analytics) the pace of growth in green building is still far less than is necessary to address the environmental challenges facing our city and planet. Design decisions made today largely determine the performance of a building for the next 20, 40, or 100 years of operation so government must play a leadership role in helping green building practices reach the mainstream.

12. *How much does the requirement to construct only LEED Silver certified buildings increase the initial cost of constructing new municipal buildings?*

Data from Davis Langdon, an international project and cost management firm, indicate that while green measures are not installed for "free," it is misleading to examine only individual construction budget line items. Rather, the entire cost of the project must be considered. Comparing real-world construction costs in the largest such database in the world, they have shown that there is no difference in the total cost per square foot of constructing LEED-rated facilities compared with non-LEED projects. Experience in San Francisco and surrounding cities supports this conclusion.

13. ***What distinguishing factors do you take into consideration when the City implements new standards for commercial vs. residential vs. industrial buildings? Why is your pending legislation that creates citywide green building standards set at commercial buildings over 5,000 square feet? Will there be a minimum square footage for standards for new residential construction?***

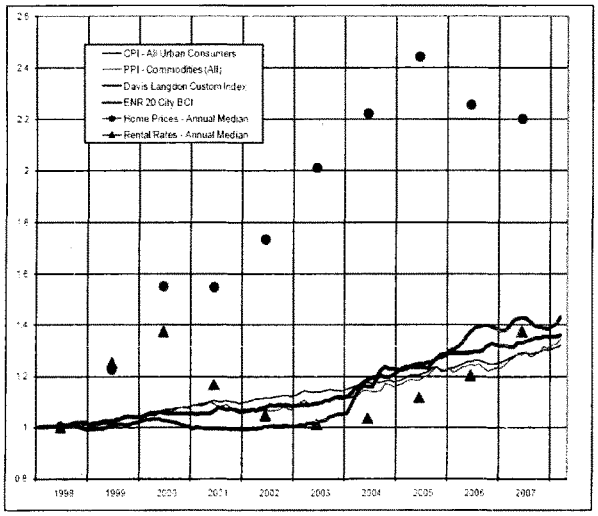
The Mayor's Task Force on Green Building was composed of building industry representatives (large and small contractors, owners and developers, commercial and residential, financial institutions, and design professionals). As a rule, the Task Force addressed only familiar building types (commercial and residential, not schools or

hospitals), and carefully created categories consistent with Planning and Building code designations. These categories then informed the setting of environmental targets appropriate for common building types, size, average budgets, and the relative green building experience in the building industry for each type of building type. For example, residential thresholds are set by number of units, a common measurement of project size in the City.

14. San Francisco is routinely listed as one of the most expensive places to live in the United States. How does the price of electricity, expensive real estate, and construction cost influence the cost of living in San Francisco? Do you see any correlation between the boon in green buildings in San Francisco and the highest real estate and rental rates in the country?

Real estate values in San Francisco are a function of limited supply and strong demand to live in a desirable location with a mild climate, urban amenities in proximity to extensive open space, and world-class historical and cultural resources. There is no statistical relationship between construction costs and real estate costs in San Francisco. In Figure 2 below, the dots and triangles plot the trend in home prices and residential rental rates, while an index of construction cost is plotted in red.

Figure 2 – 10-year trend in costs of housing and residential construction in San Francisco[3]



15. In your green development of Treasure Island – is there a set-aside for affordable housing?

[3] Source: Davis, Langdon (2008) Data from the U.S. Bureau of Labor Statistics, San Francisco Planning Department, and the Engineering News-Record.

The developer is currently required to provide 30% affordable units at various levels compared to local Area Medium Income. This is twice the City's baseline Inclusionary Housing requirement of 15% affordable units for new market-rate developments.

16. Why Silver LEED certification rather than Gold or Platinum?

At the time San Francisco committed to LEED Silver certification for new municipal facilities greater than 5,000 square feet in 2004, LEED Silver was judged to be the minimum responsible performance threshold for responsible development of civic buildings. San Francisco strives to go above and beyond this commitment; the California Academy of Sciences project is expected to receive LEED Platinum certification, for example. We anticipate that the city will review this requirement to match or exceed requirements for the private sector.

17. How are you funding your pilot projects? Is the City of San Francisco currently running a budget surplus or deficit?

Municipal facilities are funded primarily out of the capital budgets allotted by bonds. Grants and external funding are of course used when available, usually to fund exceptional systems and performance measures.

The City and County of San Francisco is required by its Charter to balance its budget each year, so we carry neither a surplus or a deficit. That being stated, our government currently has the highest amount of financial reserves in its history.

Our aim and message has always been to achieve green building outcomes within the same budget as would have employed for a project not subject to those goals. This is done by setting sustainability goals early, by integrating the project team at every phase, and by diligently balancing cost and benefits throughout the design and construction process.

18. What does the expedited approval process for LEED gold rated or equivalent building projects entail? How much time and money does it save developers?

Projects that commit to achieving LEED Gold or Platinum are eligible to receive Priority Processing. The applicant for this service meets with the 'SF Green Team,' an interdepartmental group of building experts, which confirms the project has a credible strategy and commitment to achieve LEED Gold or better. If so, the project is assigned a planner and is processed with as little delay as possible. Owing to the substantial demand to develop in San Francisco, Priority Processing can reduce total permitting time by eight to nine months, a substantial savings in carrying costs and other expenses for the developer.

19. Have you done any cost-benefit analysis on your new green building requirements?

The policy is based upon the recommendations and expertise of the Green Building Task Force, which was composed of recognized practitioners. Numerous studies indicate the requirements are cost-effective on the following basis:

- The decision to build green has substantial net present value for the developer and surrounding community.[4]
- Total construction costs for LEED buildings are not statistically different from non-LEED.[5]
- Zero percent vacancy rates in LEED certified commercial space in our region, compared with 4 to 8 percent for non-LEED office space.[6]
- Substantial cost-effective benefits for public health and workforce productivity.[7]

Since green building goals can be achieved with conventional construction budgets, and achieving those goals has substantial economic value for the developer, the occupant, and the city, and green building simultaneously contributes to desirable outcomes in terms of environmental conservation, resource management, and public health, the costs clearly outweighed the benefits. In light of the compelling case for green building, expenditure of public funds for a separate cost-benefit study was not judged to be the best use of limited fiscal resources.

20. Are you concerned that meeting these standards will cause a supply shortage for materials and manpower to help companies meet the standards?

No. The Task Force recommendations are challenging yet cost-effective, and will phase-in over five years, providing time for preparation and adjustment. Environmentally preferable material options are a common option, albeit not yet the default, and there is already substantial green building expertise among professionals. We will continue our successful educational programs and partnerships in order to continue to support the transformation of the built environment in our city, and to set an example for the region.

21. What sort of flexibility and diversity have you seen or have you promoted in green building rating systems? Do you use different rating systems for different building types or are you simply only using one rating system for all markets?

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[4] Source: Kats et al (2003) "The Costs and Financial Benefits of Green Buildings"; Davis Langdon (2007) "The Cost and Benefit of Achieving Green Buildings"; Kats (2006) "Greening America's Schools – Costs and Benefits"; and Lucuik et at (2005) "Business Case for Green Buildings in Canada".

[5] Sources: Davis Langdon (2007) "The Cost of Green Revisited" and Ibid (2004) "Costing Green".

[6] Source: Klein (2008) RealGreen Index – Quarterly real estate analysis of LEED projects in San Francisco and surrounding communities.

[7] Sources: Fisk (2000) "Health and Productivity Gains from Better Indoor Environments"; Ewing et al (2006) "Understanding the Relationship Between Public Health and the Built Environment".

From our view, the best green building rating systems have four common features:

Provide flexibility so that project teams may choose the best solutions for a given project,

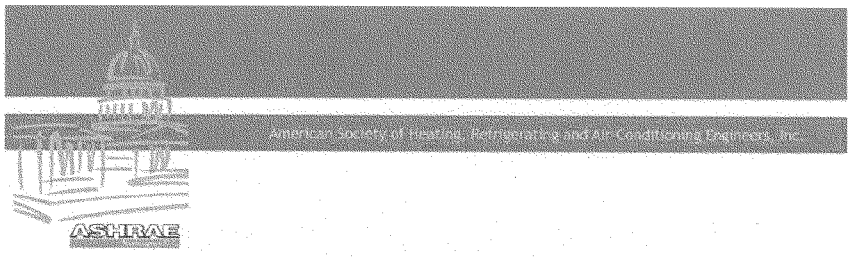
- Are maintained by a neutral yet inclusive organization.
- Reference credible existing standards to the maximum extent possible.
- Use neutral third parties to verify claims that each project receiving recognition under the rating system has implemented the measures above and beyond basic code requirements.

The USGBC's Leadership in Energy and Environmental Design rating systems, and Build It Green's GreenPoint Rated system each have these features. GreenPoint Rated is specifically designed for residential construction in California, and there is a LEED system designed for residential as well: LEED for Homes.

There is an encouraging consensus and spirit of collaboration between industry players in the Bay Area. Build It Green and USGBC have a memorandum of understanding which allows projects to be rated simultaneously under both systems, or to be referred to the rating system which may be best for the given project. The Home Builders' Association of Northern California, a regional association of the California Building Industry Association and the National Association of Home Builders, has a separate memorandum of understanding with Build It Green, recognizing GreenPoint Rated as the best standard for consistent local residential green building requirements in Northern California.
Under our proposed green building legislation, permit applicants may propose the use of other rating systems, but provided that they prove the alternate standard will provide at least the same benefits as the baseline.

22. ***How has your local ordinance affected your building department? Are they more or less accountable for construction in your area due to requirements for external green building certification, like that required by LEED?***

The San Francisco Department of Building Inspection is already accountable for construction in our area. Their first responsibility is to support the safety and health of building occupants, primarily through verification of compliance with applicable codes and standards. Proof of compliance with the proposed green building ordinance will be handled as a special inspection, submitted to the Department of Building Inspection either by the recognized rating systems or by appropriate licensed professionals.



Follow-up to Testimony of
Kent W. Peterson, P.E., Fellow ASHRAE
President, American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

To the
U.S. House of Representatives
Select Committee on Energy Independence and Global Warming

Hearing on: "Building Green, Saving Green: Constructing Sustainable and Energy-Efficient Buildings"

Chairman Markey, Ranking Member Sensenbrenner and members of the committee, thank you again for the opportunity to speak to you about energy use, buildings, and opportunities to reduce their climate impacts. I am pleased to provide the following answers to your follow-up questions.

1. *According to calculations done by Environmental Building News, commuting by office workers accounts for 30% more energy than the building itself uses. We need to think not just about energy efficiency, but about location efficiency – ensuring buildings are located in a place where people have transportation alternatives and access to services. In an era of high and rising gas prices, location efficiency is extremely important for low income families, who spend a significant amount of their income on transportation costs. Transportation costs currently account for 18% of the average U.S. household expenditures. By some estimates, the savings associated with living in a location efficient area can exceed $600 a month. How can we incorporate location efficiency into the standards that the US Green Buildings Council and Enterprise have created? Is this something we can take beyond just a few additional points of credit and consider in the underlying standards?*

ASHRAE is currently working with the U.S. Green Building Council (USGBC) and the Illumination Engineering Society of North America (IESNA) to develop a standard for the Design of High-Performance, Green Buildings Except Low-Rise Residential Buildings (Standard

ASHRAE Government Affairs • 1828 L St., N.W., Ste. 906, Washington, DC 20036-5104 USA
Tel: 202.833.1830, Fax: 202.833.0118

189.1P). The standard will contain requirements on transportation management and sustainable site development. Should a jurisdiction choose to adopt this standard as part of their baseline code, these provisions would become mandatory.

Additionally, zoning decisions would need to reflect the desire to promote locational efficiency. Currently, building codes and zoning decisions generally are not developed in a collaborative fashion to assure that the community goals are reflected across regulations affecting buildings. Greater cooperation between the building code community and the community planning sector may be necessary.

2. *One area I've been involved in is location and energy efficient mortgages – getting Fannie Mae and Freddie Mac to credit mortgage applications for the savings generated by a transit-friendly location and energy efficiency, making it easier for homebuyers to buy these homes. Do you think that if Location Efficient Mortgages were more widely available and better understood that more families would take advantage of them?*

ASHRAE generally is not involved in the financial aspects of buildings or the social implications of particular consumer choices. However, any incentive or other program that can assist homeowners in making choices that result in increased energy efficiency should be considered. As you indicate, there is the challenge of awareness of the availability of these types of programs and how they operate.

3. *How can we better use the tax code to promote green buildings?*

The tax code can serve as a significant mechanism to incentivize adoption of green buildings and energy efficiency improvements. For example, despite the short time frame for implementation and the delay in Internal Revenue Service guidance, the Commercial Building Tax Deduction included in the Energy Policy Act of 2005 has resulted in significant investment in energy efficiency. Preliminary reports from a few accounting firms have indicated the deduction has impacted over 125 million square feet and resulted in over $65 million in deductions filed—of course, this is only a fraction of the total impact of the provision. The Commercial Building Tax Deduction and other tax credits and deductions that encourage implementation of energy efficient technologies and practices should be extended.

Other incentives in the areas of renewable energy research and development and implementation are necessary to allow the widespread adoption of these technologies within the building community.

Another area of opportunity is the depreciation schedules currently associated with HVAC&R equipment—39 years. Under this current schedule, businesses are more likely to repair older,

less efficient systems than make an investment to replace them with new more efficient systems. A more realistic depreciation schedule can encourage equipment efficiency improvements and can even include incentives to go beyond minimum requirements (as envisioned in H.R. 4574). An additional benefit would be the removal of existing CFC-based chillers from the building stock.

Additional tax code based incentives can address other needs necessary to achieve and maintain energy efficient and green buildings.

- Encourage building owners to provide ongoing education and training to operations and maintenance personnel through tax credits or deductions. Provide similar incentives for architecture and engineering firms to provide ongoing training to the designers of buildings.
- Commissioning and re-commissioning of buildings can help assure that a building is operating as designed. Incentivizing its more widespread use through the tax code would be beneficial.

Given the often long timeframes required to design, permit and construct buildings, it is crucial that incentives within the tax code recognize these timeframes and building designers and owners can have certainty throughout the project.

4. *Mayor Newsome described San Francisco's efforts to ensure that its governmental centers are models of sustainability. Is this something that can be replicated at the Federal government level? Do you know what the Federal government has done in this area so far and how we can go further?*

The federal government has already taken significant steps toward setting the example of what can be done to improve the sustainability of buildings. Many agencies have adopted requirements that their buildings meet green building criteria established by a certification group like USGBC. There also are requirements put in place through the Energy Policy Act of 2005 that require new federal buildings to exceed the requirements in ASHRAE Standard 90.1-2004 by 30 percent. New federal leased space must be in buildings that have received the EnergyStar. Other requirements to reduce energy use from across agency function areas also will help reduce the energy use associated with existing buildings.

The Energy Independence and Security Act (EISA) passed by this Congress includes additional provisions focused on reducing the impacts of federal buildings. A timetable was established for reducing the fossil fuel use of federal buildings to zero by 2030. ASHRAE and other private sector organizations are working with the federal agencies to assist the development of strategies to achieve these requirements.

Because the federal government is an owner, leaser and operator of a significant portion of the nation's real estate, there is a significant opportunity to be a leader in promoting building energy efficiency and high-performance buildings. As technologies and practices are applied and tested within the federal infrastructure, they will gain traction within the private sector and contribute to further development of high-performance green buildings.

5. *Do you agree that much can be done and already is being done in the area of energy efficiency without federal intervention through local and state initiatives, building codes, private enterprises and charitable groups?*

Significant efforts are underway at the state and local level. However, there is a need to involve the federal government. As states and localities look toward improving their building energy codes, increased research and training will be necessary. These increased needs likely will require resources beyond the capabilities of most states (plus the results would be applicable across states)—therefore, federal involvement would be crucial to avoid duplication of efforts and to provide levels of funding that exceed the levels available in individual states. The Department of Energy already is engaged in many of these cross cutting activities, but additional funding for research and development and the DOE building code program would help accelerate the adoption of codes that meet the nation's energy goals.

6. *Has the EnergyStar program helped the building industry and consumers make better choices in appliances, heating and cooling systems? What other systems should also receive ratings similar to the EnergyStar program?*

The EnergyStar program has been an excellent resource for assisting consumers and the building community. It provides an easily recognizable symbol and level of confidence that the product being purchased or the building being occupied represent the top tier of choices relative to energy efficiency. There certainly are opportunities to expand the EnergyStar labels to other products and buildings that consume energy. Efforts are underway to apply the EnergyStar to datacenters—a growing sector in terms of energy use and presence in the economy.

Additional products and building types should be included under the EnergyStar program. However, the program has been underfunded relative to its potential role in impacting energy use. Additional data on our nation's building stock could also help make the program more robust.

7. *How does the energy usage break down between industrial, commercial, and residential buildings? Which sector do you see the most potential for efficiency gains?*

Industrial buildings generally are not considered to be within the buildings sector—their energy use is largely associated with the processes occurring within the facility. Currently, buildings are responsible for 39 percent of the nation's primary energy use (with 21 percent for residential buildings and 18 percent for commercial buildings). Transportation accounts for 28 percent and industry accounts for 33 percent of total U.S. primary energy consumption. Because commercial buildings generally represent larger areas of square footage within a structure there are greater opportunities to achieve results with lower cost per square foot. More specialized and complex equipment and strategies may be applied in commercial buildings where trained personnel are responsible for operation and maintenance of building systems.

8. *The AIA now requires that its members take professional continuing education classes in sustainability (starting in January 2009), but many people in the building trades, from contractors to maintenance workers, still do not receive the training they need in energy efficiency. How can we better educate all the stakeholders in the building industry in how to design, construct and operate energy efficient buildings?*

A variety of strategies will be necessary to assure stakeholders receive proper training on issues of energy efficiency and sustainability. The AIA's approach is an excellent start. Most states require continuing education for engineers and architects—including requirements focused on energy efficiency and sustainability will provide good training opportunities.

Programs that can differentiate stakeholders who have achieved a particular level of proficiency in a topic also can serve as an incentive to learn more about a particular issue. ASHRAE has developed a personnel certification program focused on High-Performance Buildings and is in the process of developing one on Operations and Maintenance.

Educating up-and-coming engineers and architects also is crucial. At the university level, at least some of the coursework should include elements of sustainability and energy efficiency.

Building code officials could also use additional training focused on sustainability and energy efficiency. However, funding at the state and local level to conduct these trainings generally is lacking. Support at the federal level through grants and training programs could be implemented.

Providing incentives to employers for engaging in these education and training opportunities may also be helpful.

9. *ASHRAE is an international group, have you learned any "best practices" for energy efficiency from your colleagues in other countries?*

ASHRAE has long looked to the international community to provide ideas for the development of standards and guidelines. We have developed relationships with similar societies across the globe and are undertaking joint projects that will benefit the entire building community and the entire international community. Specifically, we have many members of the committees that develop standards 90.1 and 189.1 that work internationally and have taken many ideas from what other countries have done.

ASHRAE is working with the Chartered Institution of Building Services Engineers (CIBSE) of the United Kingdom and others to develop building metrics and protocols that can assist with the requirements of the European Union Energy Performance of Buildings Directive. ASHRAE also is examining how the lessons learned from this program can be applied in the United States.

10. You note on page 2 of your testimony that "building codes generally are considered a state and local government issue" and of course we know that there are a number of groups working to set standards for energy efficiency. Do you believe that there needs to be a national standard or can we work with all of the current groups that have developed good criteria for energy savings?

Theoretically, there exists a national baseline for building energy codes (ASHRAE Standard 90.1-2004 for commercial buildings and the International Energy Conservation Code for residential buildings). EPAct 2005 requires states to adopt a building energy code that is at least as stringent as 90.1-2004 and the IECC. However, there are no enforcement mechanisms against the states that do not adopt codes that meet this requirement. This is largely due to the fact that building codes generally are considered a state and local government issue.

ASHRAE, the International Code Council and others are working with state and local governments to assist them in adopting codes that at least meet these initial requirements.

As future codes and standards are developed, it is necessary to evaluate all existing and proposed tools available to reduce energy use and include those that are appropriate in the updated code or standard. The consensus based process ASHRAE uses to develop its standards assures that these tools are considered.

11. Do you believe that standards should remain voluntary?

Standards are developed through a consensus process based on an identified need within the community that would utilize the standard. Therefore, standards identify the best practices within a particular industry or user group. When standards address safety, health, or other issues of national or regional importance (e.g., energy use), they should be considered by government for adoption as codes.

12. How do we make sure that standards evolve to include the newest and most effective technology as it is developed? Do you acknowledge that the government reacts too slow to innovation from the private sector to effectively update standards?

Standards by their very nature are designed to reflect current minimum levels of technology and practice that meet the criteria set out in the standard. Once technologies enter the marketplace and are proven effective, their use generally becomes reflected in standards. The ANSI (American National Standards Institute) process requires that all interested parties (including product manufacturers and advocacy groups) be given the opportunity to propose changes to an existing standard (or propose development of a new standard)—this allows for further consideration of new technologies in the development of standards.

ASHRAE has several ongoing activities that will help shape the path of future standards and help introduce new practices and technologies to the buildings industry. While Standard 90.1 serves as a minimum standard, our Advanced Energy Design Guides provide guidance for achieving energy savings beyond those provided by Standard 90.1. Standard 189.1, Standard for the Design of High-Performance, Green Buildings Except Low-Rise Residential Buildings, is currently being developed with USGBC and IESNA. Standard 189.1 will establish requirements for the design of high-performance buildings. The energy section of this standard will require greater savings than those required by Standard 90.1

In general, governments have significant responsibilities and tight budgets—therefore they are unable to develop their own standards that reflect the current state of knowledge. The federal government for instance looks to the private sector for development of relevant standards. The National Technology Transfer and Advancement Act (NTTAA, P.L. 104-113) and OMB Circular A-119 require agencies to consider the use of private sector developed standards in regulation when consistent with agency policy and appropriate for agency purposes. They also encourage federal government participation in development of these private sector standards.

13. For existing buildings, do you think there are a number of ways to make improvements to energy efficiency without having to bring them up to the new standards?

For many reasons, it is often not practical to bring existing buildings up to the standards or codes intended for new buildings. However, there are opportunities to improve the energy efficiency of these buildings. As equipment is replaced, the new equipment should be required to meet the specifications of the current code. Upgrades may be made to the lighting systems (including installation of occupancy and/or daylighting sensors) and building envelopes (changing windows, sealing cracks, adding window tint, increasing insulation, changing roofing material,

etc.). If the building is undergoing major renovation or rehabilitation, then all changes made should be in accordance with the existing code.

Depending on the age of the building and its renovation history, there may be considerable opportunities to improve its energy efficiency without bringing all elements of the building up to the current code.

ASHRAE is in the process of developing an Advanced Energy Design Guide for Existing Buildings that will assist building owners, engineers and architects in devising strategies to reduce the energy use of existing buildings.

14. How do you suggest that we encourage proper maintenance to keep buildings energy efficient?

There are many different approaches to encouraging regular maintenance. A list of options appears below.

- Provide tax credits or deductions
    - to building owners who provide education and training to their operations and maintenance staff,
    - for the costs associated with commissioning or retro-commissioning of buildings, and/or
    - for expenses associated with the operation and maintenance of buildings.
- Require or encourage the posting and annual updates of a building's energy use. Building owners, perspective tenants and owners, and the public will be able to track the energy use of buildings—should the energy use increase, the owner likely would investigate to determine the cause of the increase. Proper operation and maintenance can help identify the cause or prevent any such occurrence. ASHRAE is in the process of developing a Building Energy Labeling Program which will assist building owners in determining their building's energy use.
- Raise awareness within the financial and insurance communities that proper operations and maintenance of buildings will help protect the continued value of their assets. Provisions may be included in future contracts.
- Require through regulation or legislation a regular schedule of maintenance. Such a requirement can be enforced through inspections of building code officials or certification by an outside entity.
- Provide better data and education to building owners and managers on the role operations and maintenance of a building plays on energy use, occupant satisfaction, and other areas that affect their bottom line.

15. Did ASHRAE support the provisions in the Energy Policy Act of 2005 to require the federal government to meet energy efficiency targets for new buildings? Further, that these standards are even more stringent that your current standard?

ASHRAE is a strong proponent of going beyond the minimum requirements when practical. ANSI/ASHRAE/IESNA Standard 90.1 is a minimum energy standard for buildings. We have developed considerable guidance to encourage building designers and owners to go beyond the minimum requirements. Our *Advanced Energy Design Guide* (AEDG) series provides the means for designers and owners to go 30% beyond ASHRAE Standard 90.1-1999. We also are developing AEDGs that target a 50% improvement and ultimately will develop guidance for achieving net-zero energy buildings.

We are currently working with other private sector organizations to assist the federal agencies in achieving the requirements established in EPAct 2005 and the Energy Independence and Security Act (EISA) Congress passed late last year.

16. You raise an important point about realistic depreciation schedules for HVAC&R equipment. Would you agree that if we can help businesses afford newer, greener technologies by allowing them to amortize old equipment more quickly in the tax code? Do you also support tax credits for energy efficiency improvements?

As mentioned above, the tax code can serve as a significant mechanism to incentivize adoption of green buildings and energy efficiency improvements. The depreciation schedules currently associated with HVAC&R equipment is 39 years. Under this current schedule, businesses are more likely to repair older, less efficient systems than make an investment to replace them with new more efficient systems. A more realistic depreciation schedule can encourage equipment efficiency improvements and can even include incentives to go beyond minimum requirements (as envisioned in H.R. 4574). An additional benefit would be the removal of existing CFC-based chillers from the building stock.

The Commercial Building Tax Deduction and other tax credits and deductions that encourage implementation of energy efficient technologies and practices should be extended. Other incentives in the areas of renewable energy research and development and implementation are necessary to allow the widespread adoption of these technologies within the building community.

Tax code based incentives are just one mechanism for encouraging implementation of energy efficiency and green building technologies and practices. Increasing the stringency of minimum requirements, promoting research and development on the technologies and practices necessary,

and educating building owners, operators and designers on tools and practices will all contribute to the market penetration of efficient and green buildings.

17. What are the primary differences between ASHRAE's standards and the new NAHB standards? How do you reconcile the differences?

ASHRAE Standard 189.1 focuses on establishing minimum criteria for high-performance green buildings. The NAHB/ICC green building standard focuses on residential buildings. There are no apparent conflicts between the standards that need to be resolved--neither standard necessarily precludes the proper implementation of the other. The NAHB/ICC standard is more of a rating system with minimum criteria that has to occur (in some instances, no requirements are given to show how to meet advanced criteria). For example, the NAHB/ICC standard awards points for a percentage energy savings over the IECC (International Energy Conservation Code), but does not provide criteria on how to do that. In contrast, ASHRAE Standard 189.1 provides specific requirements in the energy section that result in approximately 30% less energy use than 90.1 (on average).

18. If residential energy bills are lower, won't consumers just purchase more flat-screen TVs and iPods with their additional disposable income? How can you force people to actually consume less energy?

Reducing overall energy use will require a comprehensive strategy. Of course, there are opportunities to reduce energy consumption within buildings. However, additional actions are necessary. Public education and awareness are essential for the public to understand the impact their choices have on energy consumption. Reducing the energy consumption of the types of products you mention also would be advantageous.

19. How does a public entity enforce building codes? Are there ways for construction companies to avoid meeting certain energy efficiency standards?

As building codes are enforced at the local level, jurisdictions have different approaches for enforcement. A typical process is that building designs are submitted to the jurisdiction's department responsible for code enforcement. If the designs submitted are determined to meet the code requirements, they are approved and a permit is issued. Once the building is completed, the jurisdiction sends a building inspector to the site to ensure that the initial designs submitted were followed. Once a standard is adopted within a jurisdiction, it is considered part of the building code and must be complied with. However, enforcement of the provisions of the building code can vary and many building projects that do not meet the minimum requirements set in the code may still be constructed.

The proper training of building code officials and funding for implementation and enforcement of building codes can help increase compliance. The Community Building Code Administration Grant Act of 2007 (H.R.4461) can provide one mechanism for assisting local jurisdictions with enforcement of building codes.

20. How has your organization collaborated with other Standards Developing Organizations (SDOs) with respect to criteria development for green building?

The expertise of other SDOs is critical for the development of standards focused on green buildings. A true green building will consider all aspects of the building from materials selection to lighting design. Therefore, the U.S. Green Building Council (USGBC) and the Illuminating Engineers Society of North America (IESNA) are co-sponsors of Standard 189.1. Other SDOs participate on the development committee including the International Code Council (ICC) and Sheet Metal and Air Conditioning Contractors' National Association (SMACNA). Further, the process used to develop standards requires consideration of input from any interested party (including other SDOs).

Our other projects including the Advanced Energy Design Guides are developed in a collaborative process with representatives from a variety of organizations with expertise in buildings including the American Institute of Architects, USGBC and IESNA.

21. Could you explain some of the potential upfront costs, both from an engineering/consultative standpoint and a building materials aspect, associated with implementing aggressive green building requirements?

As green buildings become more and more prevalent, the associated costs will decrease. However, even today, in general, green buildings do not necessarily need to cost more than other buildings. Two Davis Langdon studies have shown no statistical difference in cost between a building seeking LEED certification and a non-LEED certification seeking building--there are low cost and high cost green buildings and there are low cost and high cost non-green buildings. On an individual basis, depending on the building site and owner and developer objectives, the costs associated with building a particular green building may be higher than a non-green building.

A design team with experience in green buildings should be able to identify and recommend strategies and systems that can be implemented holistically and avoid increased costs. Given the importance of integrated design to the success of green building projects, the fee schedule and workloads of design and construction teams may need to be adjusted. More time would be spent during the design phase by all stakeholders to assure that design decisions are made holistically—this usually results in less problems throughout the design and construction process.

With respect to building materials, a significant portion of the extra cost to buy green products is due to the documentation required to assure it meets the specified requirements. Additionally, such products may be specialized due to their specific green attributes—as these products become more prevalent their costs likely will decrease.

22. How is your organization working with developers and commercial builders to obtain their input on the high performance green building initiatives you are undertaking?

As indicated above, the ANSI process for development of voluntary consensus standards requires consideration of input from all interested parties (including developers and commercial builders). It also requires that the standard development committee represents the community of interest.

Recommendations for Meeting Future Needs

I offer the following recommendations to assure that we meet the future demands placed on buildings:

- Adequately fund the federal agencies that advance the development and enforcement of energy standards and guidelines including the Department of Energy, National Institute of Standards and Technology, Environmental Protection Agency, and the General Services Administration which serves as a leader in the implementation of leading edge technologies and practices.
- Support the research and development necessary to develop and deploy cost effective technologies necessary to achieve our nation's energy goals. This includes the technologies envisioned under the Net-Zero Energy Commercial Building Initiative established in EISA. Additionally, sufficient investment must be made in R&D for renewable energy technologies such as solar, wind, water, biomass, and geothermal. These renewable energy technologies will be critical components of the design and construction of net zero energy buildings—funding for their development must parallel their importance to their role in net zero energy buildings.
- Enact policies that encourage individuals and businesses to implement energy efficient technologies and practices that go beyond the minimum requirements. This includes the commercial building tax deduction and setting realistic depreciation schedules for HVAC&R equipment.
- Continue to support the utilization of voluntary consensus standards in regulation and codes as recognized by The National Technology Transfer and Advancement Act of 1995 (P.L. 104-113) (NTTAA) and OMB Circular A-119.
- Support education programs focused on providing students with competence in science, technology, engineering and mathematics (STEM). As we are challenged to improve the

performance of buildings, we will need a skilled engineering and technician workforce to assure that the buildings are properly designed, constructed and maintained.

Thank you again for the opportunity to address the committee. Please feel free to contact me or our ASHRAE Washington Office should you require any additional information on buildings related issues.

ASHRAE Government Affairs • 1828 L St., N.W., Ste. 906, Washington, DC 20036-5104 USA
Tel: 202.833.1830, Fax: 202.833.0118

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Responses to Additional Questions
From the Select Committee on Energy Independence and Global Warming
Submitted by Enterprise Community Partners
June 16, 2008

1. *According to calculations done by Environmental Building News, commuting by office workers accounts for 30% more energy than the building itself uses. We need to think not just about energy efficiency, but about location efficiency – ensuring buildings are located in a place where people have transportation alternatives and access to services. In an era of high and rising gas prices, location efficiency is extremely important for low income families, who spend a significant amount of their income on transportation costs. Transportation costs currently account for 18% of the average U.S. household expenditures. By some estimates, the savings associated with living in a location efficient area can exceed $600 a month. How can we incorporate location efficiency into the standards that the US Green Buildings Council and Enterprise have created? Is this something we can take beyond just a few additional points of credit and consider in the underlying standards?*

Enterprise recognizes that location efficiency is a critical issue in ensuring true sustainability in affordable housing. The Green Communities initiative strongly encourages location efficiency through requirements for proximity to existing development, access to services, density and walkability and heavily weighted optional criteria for access to transit, greater density and additional services. While green development frameworks such as Green Communities can and must drive location efficiency to the greatest extent possible, they will be only partially effective in and of themselves. Major barriers to location efficiency exist at the local level, such as exclusionary zoning. In addition, the high cost of land around planned transit sites creates huge challenges for organizations trying to build and preserve affordable, location-efficient housing. Federal leadership is needed to address these issues.

The federal government should provide incentives for local communities to take action to ensure development around transit sites include affordable housing by providing bonus funding under transportation and housing grant allocations, greater flexibility to combine federal funding streams and streamlined reporting requirements. The federal government also should provide seed capital to enable local communities to create capital pools to acquire land around transit sites for affordable mixed-use and environmentally sustainable development. Next year's transportation reauthorization bill may provide an opportunity to substantively encourage this kind of transit-oriented development.

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American City Building ▪ 10227 Wincopin Circle ▪ Columbia, MD 21044 ▪ 410.964.1230 ▪ www.enterprisecommunity.org

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2. *One area I've been involved in is location and energy efficient mortgages – getting Fannie Mae and Freddie Mac to credit mortgage applications for the savings generated by a transit-friendly location and energy efficiency, making it easier for homebuyers to buy these homes. Do you think that if Location Efficient Mortgages were more widely available and better understood that more families would take advantage of them?*

Enterprise believes that increased efforts to educate consumers about the benefits of energy efficient and location efficient mortgages would encourage greater take-up rates in the marketplace. A bill passed by the House of Representatives (H.R. 1427) that strengthens the federal financial oversight of Fannie Mae and Freddie Mac includes a provision giving the companies extra credit toward meeting their affordable housing goals for purchasing mortgages on properties that are energy efficient or otherwise environmentally responsible. The provision would help mainstream mortgage products that recognize and encourage more sustainable homes and developments. Congress should enact this proposal, perhaps as part of the housing legislation under consideration this summer. The Federal Housing Administration should also have greater ability to provide energy efficient and location efficient mortgages.

In addition, the federal bank regulators should allow banks to receive favorable consideration under the Community Reinvestment Act (CRA) regulations for lending, investments and services that account for the extent to which an affordable housing project incorporates energy efficiency features that lower the housing costs for residents and/or enhance the long-term viability of the project as affordable housing, such as through stronger reserves for maintenance and improvements. (More broadly, the CRA should be strengthened to encourage banks to provide financing for holistic environmentally sustainable community development.)

3. *How can we better use the tax code to promote green buildings?*

First, Congress should reinstate the Credit for Nonbusiness Energy Property that effectively expired in 2007. This provision generally provided an individual tax credit for 10 percent of the expenditures for energy efficiency improvements in the building envelope of existing homes and for the purchase of high-efficiency heating, cooling and water heating equipment, up to $500.

In reauthorizing the credit, Congress should increase the amount to 50 percent of expenditures up to $5,000 for low-income families. The credit also should be modified to support costs associated with installation as well as materials and a broader range of energy improvements, specifically including with air infiltration and air infiltration duct sealing.

Second, Congress should revise the Energy Efficient New Homes Credit. This provision generally provides a tax credit of up to $2,000 to builders or contractors that achieve deep levels of energy efficiency in new homes up to three stories.

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The credit should be modified to support mid-sized and large multifamily properties (where the large majority of low-income people live). A more flexible but still rigorous energy performance standard should apply to affordable properties. The standard for new construction could be Energy Star or the American Society of Heating, Refrigeration and Air Conditioning (ASHRAE) Standard 90.1-2004 plus 20 percent or its equivalent. The standard for rehabilitations of existing properties should be improvement of 15 percent above performance before rehabilitation.

Finally, Congress should revise the Business Energy Tax Credit and continue the level of support it generates for solar property. This provision provides a credit of 30 percent for expenditures on qualified "energy property," including solar technologies that can be used on multifamily affordable developments, among other purposes. Generally if a development has other financing from a public source, the taxpayer must reduce the basis for calculating the credit by the amount of any such incentives received. Since very low-income multifamily housing relies heavily on government financing, including other tax credits, this provision of the Business Energy Credit, limits its effectiveness in supporting the full costs of installing solar technologies in affordable housing developments. In addition, the tax credit amount for solar will be reduced from 30 percent to10 percent in 2009 absent a legislative change by Congress.

In addition, the Business Energy Tax Credit should be made permanent and the amount for solar set at 30 percent permanently. And properties serving very low-income people should be able to realize the full value of the credit without regard to other sources of financing for the development.

4. *Mayor Newsom described San Francisco's efforts to ensure that its governmental centers are models of sustainability. Is this something that can be replicated at the Federal government level? Do you know what the Federal government has done in this area so far and how we can go further?*

As we understand the question it relates to efforts the federal government can make to improve the sustainability of its own buildings and operations. We are not experts in this area, but would refer to the written testimony of the U.S. Green Building Council for this hearing, especially pages 11 – 13.

5. *Do you agree that much can be done and already is being done in the area of energy efficiency without federal intervention through local and state initiatives, building codes, private enterprises and charitable groups?*

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Code strengthening, state and local leadership, and private sector and community-based innovation are already driving major progress in increasing energy efficiency in affordable housing and other parts of the built environment. Federal leadership is essential to accelerate this momentum and take to scale the best practices and technologies that are emerging. This does not mean big new government programs, but rather carefully targeted investments that will complement and amplify the work already underway as well as build out the infrastructure and capacity of the development and construction industries to work in new ways.

With respect to affordable housing, Enterprise projects that a federal commitment of $5 billion a year over 10 years could deliver huge benefits across the board: 25 percent - 40 percent energy savings in up to 25 million residential units, up to 50 million tons of carbon dioxide emissions avoided and hundreds of thousands of green jobs created annually when fully implemented.

Such a federal commitment is relatively modest when one considers that the U.S. Department of Housing and Urban Development (HUD) currently pays nearly $5 billion annually in utility bills in often inefficient government-assisted properties that constitute a fraction of the homes and apartments that could benefit. And $5 billion is a very small share of the projected revenues that would be generated under proposals to curb greenhouse gas emissions under consideration in Congress and supported by the major candidates for president.

6. *Has the EnergyStar program helped the building industry and consumers make better choices in appliances, heating and cooling systems? What other systems should also receive ratings similar to the EnergyStar program?*

The Energy Star program has been a huge success. According to the Environmental Protection Agency:

> Thousands of organizations have partnered with the federal government to demonstrate a commitment to protecting the environment through energy efficiency. Americans have purchased more than 1 billion ENERGY STAR qualified products. More than 100,000 families live in new homes that have earned the ENERGY STAR. More than 40 percent of the American public recognizes the ENERGY STAR. Thousands of buildings have undergone effective energy improvement projects. More than 15,000 of the nation's buildings have been rated using EPA's national energy performance rating system. More than 1,100 buildings have earned the ENERGY STAR label for superior energy performance. Further, because using energy more efficiently avoids emissions from power plants, avoids the need for new power plants, and reduces energy bills, sizable national benefits have accrued.

For more information, please refer to the Energy Star website: http://www.energystar.gov/

7. *How does energy usage break down between industrial, commercial, and residential buildings? Which sector do you see the most potential for efficiency gains?*

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According to the U.S. Green Building Council, buildings account for 39 percent of energy consumption compared to 32 percent for transportation and 29 percent for industry (www.usgbc.org/DisplayPage.aspx?CMSPageID=1720). (These figures are roughly equivalent to carbon dioxide emissions by those sectors as well.)

We do not have expertise in transportation and industrial efficiency. It is widely agreed among energy and environmental experts that reducing energy waste in buildings can be a major contributor to reducing energy use and curbing climate change. A recent report from McKinsey and Company found that several of the most cost effective ways to abate greenhouse gas emissions are in retrofitting existing buildings to be more energy effcient. Please see www.mckinsey.com/clientservice/ccsi/greenhousegas.asp for more information.

8. *The AIA now requires that its members take professional continuing education classes in sustainability (starting in January 2009), but many people in the building trades, from contractors to maintenance workers, still do not receive the training they need in energy efficiency. How can we better educate all the stakeholders in the building industry in how to design, construct and operate energy efficient buildings?*

Investments in training and capacity building in the real estate, construction and building energy industries are critical to scaling up energy efficiency. Investments should focus on conventional professions, such as contracting, as well as smaller but essential fields, such as energy audits and raters. This is a critical connection to the emerging interest at all levels of government and in the private sector in creating "green jobs" at scale. (Please see the response to Question 14 below for more on green jobs.)

9. *Your written testimony describes collaborations with Mayor Newsom and Governor Pawlenty of Minnesota, as well as that state's affordable housing industry. Has Enterprise performed work in South Dakota or considered working in my state, including through partnerships with the sovereign Native American tribes?*

Enterprise has helped create affordable housing on the Pine Ridge Reservation in South Dakota prior to the creation of the Green Communities initiative. In addition, Enterprise financed 15 of the green affordable housing on the Rosebud Reservation in 2007. While this development, Sicangu Village, did not meet all the Green Communities Criteria, it includes a geothermal heating and cooling system, which substantially reduces utility costs.

Enterprise is expanding its Green Communities efforts to include Native American communities. We recently initiated series of training programs. The first trainings were held in Seattle at the National American Indian Housing Council's 34th Annual Convention and Trade Show. The presentation drew more than 600 attendees

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As discussed by cell, Sicangu Village is a 15 unit Enterprise tax credit investment located on Rosebud Sioux Reservation. Green feature is geothermal heating/cooling on each single house costs.

10. *In your testimony, you state "Yet some otherwise worthy ideas for fighting global warming, such as proposals to cap greenhouse gas emissions, could impose significantly higher costs on the poor. Nearly half of the increased costs could come from more expensive home energy." I agree with that statement and that is why I think pursuing energy efficiency is a practical way to address global warming. Can you tell us what the average cost of building a "Green Communities" home is? And what is the average savings on an energy bill for such a home?*

In creating Green Communities, Enterprise sought to show that all affordable housing – new construction and rehabilitation, ownership as well as rental, large urban developments and small rural projects – could be green within the budgets and capacity of the typical affordable housing developer. Enterprise also intended to show that green affordable developments could be created for little if any higher development costs than conventional projects that do not offer the same benefits. Enterprise endeavored to demonstrate the benefits of green affordable development.

Experience suggests it can be done. The Green Communities portfolio represents virtually every form of housing, in every type of climate, in every kind of community in the country. New rental construction in the suburbs outside Portland, Ore. Homeless housing on an infill site in downtown San Francisco. Single family homeownership in Blacksburg, Va. Senior living with services in Baltimore. Farmworker homes in rural Ore. Historic preservation outside Chicago. Family housing in Billings, Mont. Adaptive reuse with solar power in central Los Angeles. New subdivision for-sale units in Bonita Springs, Fla. Public housing revitalization in Cleveland. Transit oriented development in Cambridge, Mass.

Enterprise's extensive evaluation efforts are generating data that show that we can create highly sustainable homes for low-income families such as these for only marginally higher development costs – 2 percent to 4 percent on average – and those costs can come down with experience. Critically, our evaluation suggests that most of the marginally higher costs are attributable to measures that generate financial savings, such as energy and water efficiency features, or enable developments to properly plan an "integrated design," which has been shown to lower costs and enhance environmental performance in buildings.

Enterprise's experience through the Green Communities program indicates that new and existing properties that achieve 20 percent to 30 percent greater energy efficiency generate substantial cost savings from lower energy and water usage – hundreds of dollars per unit on an annual basis in many cases. These savings either accrue directly to low-income residents, or are reinvested back into properties by building owners, or both.

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This is consistent with other research on improving energy efficiency in very low-income homes. For example, the Department of Energy reports that Energy Star-qualified single-family homes delivered $200-$400 in annual savings compared to conventional homes, with potentially substantial additional savings on maintenance.[i]

11. It is my assumption that most low income families are in older houses. Is your organization working to upgrade existing structures or just build new ones? What are the most pressing needs for older houses? Insulation? Windows? Can you rank what provides the largest benefit per dollar spent?

Enterprise is addressing both new construction as well as rehabilitation of existing properties through Green Communities. There are roughly 25 million existing units that are home to households with annual incomes of $25,000 or less in this country.[ii] This income level is generally in line with the federal housing policy definition of "very low-income." It is approximately equivalent to 50 percent of the national median income and 150 percent of the federal poverty level for a family of three.

Very low-income people are much more likely to live in less efficient buildings, which exacerbates the affordability problems millions face. Very low-income owners may only be able to afford homes that need energy upgrades to begin with and may have less income with which to make energy improvements. The Harvard University Joint Center for Housing Studies has reported:

> While low-income households will, out of necessity, replace furnaces or appliances that break, they will not usually install insulation or other more costly measures because they lack the money to do so. Instead, they often take simpler and less effective steps such as putting plastic on windows in the winter and using towels to stop drafts from doors and windows.[iii]

Low-income renters typically can afford only modest monthly payments, which constrains the ability of building owners to make building improvements. And more than half of low-cost, privately owned rental stock was built at least 30 years ago. According to Harvard University's Joint Center for Housing Studies, "much of [the inventory] is owned by individuals without the skill and resources to manage the properties profitably. And when their rental units cannot generate enough revenue to cover basic operating costs, these owners have little choice but to cut back on maintenance and repairs."[iv]

It is difficult to generalize about the most cost effective building features or improvements for increasing energy efficiency.

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In simplest terms, very basic measures that are too often overlooked or not properly performed – thorough duct sealing, adequate insulation, right-sized HVAC systems – can substantially improve energy efficiency; they are also essential first steps to maximizing the potential of improvements that can generate deeper reductions, including renewable energy and on-site energy generation. Insulation and sealing are especially important and effective with respect to existing buildings. In addition, according the Energy Programs Consortium:

> Replacing heating and cooling systems, windows, and doors can also help improve savings when properly installed in homes that are also receiving insulation and air sealing or, alternatively, that are already considered to be well sealed. Because they are already better insulated and have newer heating systems, homes built after 1979 offer the fewest opportunities for saving energy, and should not serve as primary targets of an energy-efficiency mortgage program. Replacing older water heating systems can also reduce energy costs, particularly when combined with an otherwise efficient and insulated hot water distribution system. Switching fuels is often only cost effective when the heating system is already in need of replacement and when the fuel prices demonstrate substantial and long-term differences.[v]

12. *While I support energy efficiency, I am also concerned that neighborhoods not lose their character as homes are upgraded to be more energy efficient. Has your group given thought to historic preservation as you look at updating old housing?*

This is a very important issue. Preservation of existing buildings is in and of itself a more sustainable form of development. Historic structures also contribute greatly to the character of their communities and many are located in low-income areas. Enterprise worked hard to develop the Green Communities Criteria that enable historic properties to qualify for rehabilitation without losing their unique historic status. A number of Green Communities projects are listed in national and local historic registries. Two examples are linked here:
http://www.greencommunitiesonline.org/projects/profiles/ripley_gardens.pdf
http://www.greencommunitiesonline.org/projects/profiles/new_holland.pdf

13. *You ask for a federal commitment of $5 billion over 10 years – to clarify do you mean $5 billion each year for 10 years? How would you suggest such funds be distributed? What restrictions would you place on the funds to ensure they were properly spent?*

Enterprise's 10-point plan for federal leadership to bring home the benefits of green homes to low-income households is linked here:
http://www.practitionerresources.org/cache/documents/663/66381.pdf.

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We believe that such a commitment would be a relatively modest and high-impact investment, as noted in the response to Question 5. We recommend that resources be allocated overwhelmingly through existing proven programs and modifications to existing policies, ranging from federal grant programs to tax incentives to regulations for financial institutions. We recommend very small amounts of funding for new initiatives, primarily to build capacity and support innovation that the private market can take to scale. Congress could require recipients of these resources to document the energy and other environmental outcomes of their projects.

14. The term "green jobs" is thrown about fairly liberally around here. How do would you define a green job? Is it the construction worker who builds the house, people who put in green technologies, people who install Energy Star appliances?

We believe that the United Nations Environment Programme's definition of "green jobs" makes a great deal of sense. That leading international body defines "green jobs as:

> ...Positions in agricultural, manufacturing, R&D, administrative, and service activities aimed at alleviating the myriad environmental threats faced by humanity. Specifically, but not exclusively, this includes jobs that help to protect and restore ecosystems and biodiversity, reduce energy, materials, and water consumption through high efficiency and avoidance strategies, de-carbonize the economy, and minimize or altogether avoid generation of all forms of waste and pollution.
>
> ...A green economy is an economy that values nature and people and creates decent, well-paying jobs. Technological and systemic choices offer varying degrees of environmental benefit and different types of employment. Pollution prevention has different implications than pollution control, as does climate mitigation compared with adaptation, efficient buildings vis-à-vis retrofits; or public transit versus fuel-efficient automobiles. It is of course preferable that the most efficient, least-polluting options receive priority. But these are not either-or choices, as all of these options are needed to bring about a more sustainable, low-carbon economy. But they do suggest "shades of green" in employment.[vi]

A recent study identified 22 different job sectors of the U.S economy that currently provide workers with green collar jobs, of which 11 were directly (not to say exclusively) related to green home rehabilitation, including several specifically tied to energy efficiency.[vii]

The condition of many homes and apartments where our lowest income citizens live creates opportunities for significant energy savings and other environmental improvements through cost-effective rehabilitation measures. These approaches – insulation, chimney and roof repairs; caulking and sealing; window replacements; installation of energy-efficient equipment; and systems and building testing – offer good paying jobs for which low-income workers could be trained and employed.

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Increased investment in green very low-income home rehabilitation could create these jobs at scale. One study of a residential retrofit initiative in Germany showed that 140,000 jobs were saved or created in retrofitting 200,000 homes.[viii] The Department of Energy (DOE) estimates that every $1 million invested in weatherization programs creates 52 low-income community jobs.[ix]

Of course, not all construction jobs on green very low-income developments could fairly be characterized as "green jobs" absent an intentional effort to provide training in the energy efficient and environmentally responsible aspects of the work even without such an explicit commitment, green home rehabilitation and construction "does have the potential to create entry level job opportunities for low-income and people of color when cities implement a combination of policies that promote green building, job training and labor standards."[x]

Green jobs associated with very low-income housing can be created outside of construction, such as in the areas of home energy audits, inspections and building performance testing. And as innovation and public policies accelerate market penetration of renewable energy technologies, opportunities should emerge to create more green economy jobs, and deliver the energy and environmental benefits of clean energy to low-income people through energy efficient home construction and rehabilitation.

The Energy Independence and Security Act that enacted the Energy Efficiency and Conservation Block Grant also authorized $125 million to establish an energy efficiency and renewable energy worker training program. Congress has not yet funded the program, but should do so beginning in fiscal year 2009.

Under the bill, the Secretary of Labor, in consultation with the Secretary of Energy, would establish an energy efficiency and renewable energy worker training program by awarding National Energy Training Partnership Grants on a competitive basis to eligible entities. Eligible entities would be non-profit organizations in partnership with public or private employers and labor organizations, as well as workforce investment boards, community-based organizations, educational institutions, small businesses, cooperatives, veteran's service organizations and state and local veterans agencies.

Another component of the training initiative is the Pathways Out of Poverty Demonstration program, which seeks to demonstrate how quality training can lead to job ladders that bring individuals with incomes of less than 200 percent of poverty up to at least a level of self-sufficiency.

Congress should fund the program at the authorized level and the Labor Department should work with HUD as well as DOE to leverage green job creation opportunities through federal housing and community development programs.

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15. *In your written statement, you bring up an important issue about criteria for being green. I agree with you that it isn't necessarily one set of standards that is necessary or even workable in a technology driven environment. The truth is that government can't keep up with private sector innovation. What do you suggest that we do to foster the kind of policy that helps programs like yours be most effective?*

Relatively modest, carefully targeted federal investment as we recommend can stimulate increased green development and rehabilitation as well as capacity in the real estate, construction and building energy efficiency industries, as noted earlier. These investments can directly drive private sector innovation. As Dan Reicher of Google, formerly the federal Acting Assistant Secretary of Energy for Energy Efficiency and Renewable Energy, has noted:

> The advanced technologies pioneered in the federal low-income weatherization program could be readily applied to the U.S. housing stock at large with even greater energy savings. One technology developed by the Department of Energy uses a pressurization device and simple infrared sensors to pinpoint leaks down to the size of a nail hole for about $100 per home. With this information, insulation can be installed in the right places for the least amount of waste.[xi]

16. *We generally hear a lot from cities like San Francisco, Portland and Seattle to name a few – what is your organization doing to reach out to less green-focused cities, perhaps smaller ones, where there are just as many needs for low-income folks, but not necessarily the programs in place to help them become more energy efficient?*

There are dozens of Green Communities developments in smaller cities and towns and rural areas. Enterprise believes that affordable homes can be – and must be – green in every community. There can be additional challenges to green development in smaller and more remote places, as affordable development of any kind is often more difficult in such communities. Limited capacity and access to resources can be major barriers. One of the ways we are working to address these issues is by working with state governments. Ultimately, a commitment of federal resources will be needed to ensure that the promise of the green economy is available in all parts of the country.

17. *I think it is important to pool resources to fix a problem. For example, Habitat for Humanity has been building houses for lower income families for a long time. Has Enterprise partnered with that organization or others doing similar work to build greener houses?*

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Enterprise has worked with Habitat for Humanity International for many years. We provided seed funding and technical expertise to enable Habitat to expand its efforts in green building. Enterprise also works collaboratively with other national organizations on green affordable development, including Neighborworks America (training and green rehabilitation programs in New Orleans and other cities), the Housing Assistance Council (capacity building for smaller organizations serving rural communities) and the Local Initiatives Support Corporation (loan fund for green developments in Louisiana).

18. *You note the foreclosure crisis in your testimony, what specific policies do you believe need to be in place for redevelopment of foreclosed properties? Would this be a federal, state or local policy?*

Enterprise is actively working with members of Congress and leading housing organizations toward provision of a minimum of $4 billion in federal neighborhood stabilization funding to help states, cities and communities reduce downward pressure on local housing markets. The funds provided would help to purchase vacant, blighted properties, rehabilitate them using energy efficient and other green practices to the greatest extent feasible, and resell or rent them affordably to qualified families.

Returning these properties to productive use is vital to overcoming the foreclosure crisis. Typically rehabilitating these homes serves as infill development in older communities in urban areas and inner-ring suburbs, helping to reduce sprawl and related pressures on the environment. And rehabilitation of these homes will also create construction jobs in an otherwise moribund sector.

As of this writing, House and Senate leaders appear to have agreed to include this provision in the final version of the housing bill Congress is expected to vote on before the July 4 recess. Please see http://www.saveamericasneighborhoods.org/ for more information.

19. *Where did the $555 million come from for the initial Green Community program? Did you receive matching funds from government resources?*

The initial commitment of funds, and the additional amounts raised since that commitment, came from private sources – primarily financial institutions and foundations. A small amount of support has come from individual donations. The funds have been provided as equity investments for federal tax credits, low-interest loans and grants. Less than one percent of direct funds Enterprise has committed through Green Communities have come from federal sources, and primarily for the capacity building of nonprofit affordable housing developers to build more sustainably.

20. *You mention working with owners of rental properties to develop maintenance and operations plans to keep buildings green over time – I think that is a very big challenge. How do you suggest Congress facilitate this practice?*

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The "next frontier" in green building is ensuring that properties continue to achieve their intended levels of energy and environmental performance after they have been built or rehabilitated. In affordable housing that means education of low-income residents as well as building owners and property managers in the case of rental housing. The Green Communities Criteria requires developers to provide a manual that includes the following: a routine maintenance plan; operations and maintenance guidance for all appliances, HVAC operation, water-system turnoffs, lighting equipment, paving materials and landscaping, pest control, and other systems that are part of each occupancy unit; and an occupancy turnover plan that describes in detail the process of educating the tenant about proper use and maintenance of all building systems. To assist developers in creating such a manual, Enterprise has developed a Building Maintenance Manual Template, which is linked here:
http://www.practitionerresources.org/showdoc.html?id=63995&topic=8.%20Operations%20and%20Maintenance&doctype=Model%20Document.

The Green Communities Criteria also requires developers to provide a guide for homeowners and renters that explains the intent, benefits, use and maintenance of green building features, along with the location of transit stops and other neighborhood conveniences and features, and encourages additional green activities such as recycling, gardening, use of healthy cleaning materials, alternative measures to pest control, and purchase of green power. Again, Enterprise has developed a template, the Occupant Manual Template, linked here:
http://www.practitionerresources.org/showdoc.html?id=63997&topic=4.%20Water%20Conservation&doctype=Model%20Document.

Finally, the Green Communities Criteria require developers to provide a comprehensive walk-through and orientation to the homeowner or new resident using the Occupant Manual that reviews the building's green features, operations and maintenance, along with neighborhood conveniences that may facilitate a healthy lifestyle.

Congress should provide funding for training and technical assistance to building owners and low-income residents in these and related areas.

21. Are your criteria similar to LEED certification standards? In what ways do they differ?

Enterprise works very closely with the U.S. Green Building Council in a number of areas. We deeply admire the organization's core values, remarkable effectiveness and deep commitment to ensuring the green building movement includes all members of society.

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Enterprise and USGBC have worked closely to align the Green Communities Criteria with USGBC's new LEED for Homes (LEED-H) rating system. The result is that a development that achieves the Green Communities Criteria will meet all the requirements under LEED-H. A growing number of Green Communities developments are seeking LEED-H certification and we are actively encouraging our partners to explore that option.

In most cases a development that achieves LEED for Homes certification will meet the Green Communities Criteria. There may be instances of LEED-H developments missing full compliance with the Green Communities Criteria by a handful of items as the Green Communities Criteria are more prescriptive than LEED-H in that the Green Communities Criteria has more mandatory components.

The Green Communities Criteria were specifically designed for affordable housing and so apply to a wider range of building types common in that sector than LEED-H. The Green Communities Criteria apply to larger residential buildings and a broader range of rehabilitation developments; LEED-H generally applies only to buildings of four stories or lower.

22. *How do you keep the affordability aspect in the forefront as you develop criteria and work on projects?*

Keeping affordability at the forefront is the essential element of Green Communities, as Enterprise's mission is affordable housing. The Green Communities Criteria were developed in 2004, when there was no national rating system for green residential buildings and when only a handful of local green building programs addressed affordable homes in any context.

The Green Communities Criteria were intended to fill this void in the marketplace and were specifically designed to provide a workable framework for green affordable housing that was 1) holistic, encompassing smart siting and locational elements as well as green building features; 2) applicable to the range of affordable housing developments across the country, meaning new construction and rehabilitation, for-sale and rental, single family and multifamily; and 3) cost effective for most affordable housing developers to implement.

As noted in the response to Question 10, Enterprise's experience is that virtually any kind of affordable housing development can meet the Green Communities Criteria without sacrificing on affordability (or number of units). We do not take that question for granted, however, and have invested substantial resources into developing a sophisticated survey instrument that all Green Communities projects complete that measures and documents their cost effectiveness in development.

23. *I agree with you that we should not let "standards" arguments hold up good action- how do you suggest we encompass all of the work that is being done in this area by various groups?*

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In practice, green development is not about satisfying a checklist of environmental criteria per se, but about establishing the environmental goals for a project that reflect the priorities, opportunities and challenges that its stakeholders identify. Standards and criteria have inherent limitations in such a dynamic, broad-based area as sustainable development.

Criteria are essential, however, for establishing common benchmarks of performance, ensuring depth of environmental outcomes and defining for policymakers – as well as developers, capital providers and other stakeholders – a reference point for evaluating results.

Enterprise strongly supports raising the bar on environmental performance in affordable housing. Experience and a growing body of evidence cited earlier show that higher thresholds appropriately implemented can directly lead to significant environmental, economic and health benefits without imposing infeasible higher costs.

Congress should proceed carefully in establishing benchmarks that define green building requirements. This is not about advocating for one green building program over another. In fact, there are several proven programs in the marketplace, including the Green Communities Criteria that can provide the basis for Congress to set policy. Congress and HUD have ample authority and ability to establish benchmarks based on existing programs that do not run afoul of laws or regulations in other areas.

More broadly, Congress clearly can reference in legislation proven green development criteria that measurably improve environmental performance without limiting its flexibility or that of HUD or local communities to revise them over time or adopt more targeted solutions. In fact Congress does not even need to pick and choose among green building programs; it could simply raise the bar by establishing specific, measurable targets for building performance based on widely accepted benchmarks such as Energy Star.

24. *What areas of energy efficiency for homes do you think need to be more focused on by industries and technological research?*

Among the subjects that would warrant deeper investment in research and development would be: 1) tools to enable comparative analysis of the cost effectiveness and energy and environmental benefits of a range of potential improvements to actual buildings; and 2) methods for integrating renewable energy into affordable housing and community development initiatives at scale on a cost-effective basis.

25. *How was the Green Communities Criteria Checklist developed exactly? Did this involve any third-party approval or accreditation at any point?*

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The Green Communities Criteria were developed through a consensus-based process and endorsed by a number of national organizations: Enterprise, the Natural Resources Defense Council, the American Institute of Architects, the American Planning Association, the National Center for Healthy Housing, Southface, Global Green USA, the Center for Maximum Potential Building Solutions and experts associated with the U.S. Green Building Council (USGBC).

The Green Communities Criteria reference established national standards, such as Energy Star and ASHRAE, in many major categories. As noted the Criteria are aligned with USGBC's LEED-H rating system. And the Criteria are compatible, by design, with the leading local green building programs that are intended for affordable housing, such as Southface's EarthCraft Multifamily program.

More than 20 state and local housing agencies have adopted policies based on the Green Communities Criteria, in some cases referencing it by name, in others not by name but retaining virtually all its elements and in others using it loosely as broad guidance.

The Green Communities Criteria remain the only national standard specifically designed for affordable housing. Enterprise believes that the Green Communities Criteria, based on its track record in the industry, is an appropriate framework for federal policy to advance green affordable homes. Other proven, effective green building standards, specifically including LEED–H and EarthCraft Multifamily, may also be appropriate for federal policy.

A legitimate issue is what happens when standards change. Policymakers can provide flexibility by adopting specific criteria and simply adding language that also authorizes "substantially equivalent" standards as determined by the appropriate administering agency.

26. *Could you explain some of the implications of mandating the Green Communities Criteria Checklist for lower income communities? What are some of the upfront costs and who pays for them?*

The impact of increasing energy efficiency and making other improvements in the performance of affordable housing would have significant health, economic and environmental benefits. Enterprise's experience through the Green Communities program indicates that new and existing properties that achieve 20 percent to 30 percent greater energy efficiency generate substantial cost savings from lower energy and water usage – hundreds of dollars per unit on an annual basis in many cases. These savings either accrue directly to low-income residents, or are reinvested back into properties by building owners, or both.

This is consistent with other research on improving energy efficiency in very low-income homes. For example, the Department of Energy reports that Energy Star-qualified single-family homes delivered $200-$400 in annual savings compared to conventional homes, with potentially substantial additional savings on maintenance.[xii]

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For multifamily apartment owners, more energy efficient buildings may generate higher and more stable cash flow from rents. To the extent energy improvements were part of more holistic green building rehabilitations, rental properties may be more durable and higher performing and potentially more valuable assets to own over the long term. Renters themselves stand to benefit, as noted above. A study of the costs and benefits of green very low-income housing by New Ecology and the Tellus Institute concluded: "For residents of affordable housing units, the life-cycle financial outcome [of energy and healthy home upgrades] is almost always positive." In virtually all the cases, energy and water utility costs are lower than their conventional counterparts.[xiii]

In addition, studies of home weatherization and retrofit programs have catalogued an "array of benefits beyond energy savings," including greater comfort, convenience, health, safety and noise reduction. These "non-energy benefits" have been broadly estimated to be worth 50 percent to 300 percent of annual household energy bill savings.[xiv] There is also emerging evidence that green homes are healthier.

While researchers are still determining the most effective specific approaches, according to Rebecca Morley, executive director of the National Center for Healthy Housing:

> It is clear that we can expect substantial health gains by building green. Instead of paying for medical care that could have been avoided, occupants in Green Communities will be able to keep more of their income and avoid the suffering and loss associated with poor health.[xv]

A promising effort is underway at the High Point Green Communities development in Seattle. Some homes have additional green features to address asthma. Preliminary research results show very positive results:

- The average number of symptom-free days for the homes' asthmatic residents in a given two-week period went from 7.6 days in the residents' old homes to 12.4 days in their new homes.
- In their old homes, 61.8 percent of residents had unplanned urgent clinical visits during the test period; in their new homes, that plummeted to 20.6 percent.
- In the home environment, asthma triggers were also greatly reduced.
- Caretaker quality of life improved.
- Mold was eliminated completely after one year.[xvi]

Energy efficiency in very low-income housing at scale also can help fight climate change. Residential units consume 22 percent of the nation's energy and cause 20 percent of our greenhouse gas emissions.[xvii] The 25 million units that are home to our lowest income citizens are almost one-quarter of all residential units in the country. Most of these units were built before 1980 and many were poorly constructed. Not surprisingly, lower income households use 28 percent more energy per square foot than higher income households, primarily because they live in older, less energy efficient homes, according to the Energy Programs Consortium.[xviii]

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While research on the carbon reduction potential from energy efficiency in very low-income homes is limited, it suggests significant impact. One recent analysis suggest that the 34 million households eligible for federal home energy assistance generated 276 million tons of carbon dioxide emissions, 27.5 percent of total emissions from residential units overall.[xix] Another study found that weatherizing 12,000 homes in Ohio avoided more than 100,000 pounds of sulfur dioxide and 24,000 tons of carbon dioxide, while cutting average utility costs for low-income homeowners by an average of several hundred dollars per year.[xx]

In addition, increasing energy efficiency in low-income homes attacks a significant contributor of greenhouse gas emission in the U.S. – residential homes – at the root of the problem: the buildings themselves. And it reduces emissions for the long term. While critically important, other approaches to ensuring equity in climate change policy, such as helping low-income people afford higher energy costs, do not deliver these enduring systemic benefits.

Investment in increasing energy efficiency in very low-income homes would generate significant economic activity in the construction industries and other sectors that have been hard hit by the economic downturn. According to the Center for American Progress, residential construction employment – the component of the construction sector most directly affected by the housing slump – fell nearly 7 percent in 2007, a loss of nearly 200,000 jobs.[xxi] Smart federal investments can help this critical industry to our economy bounce back more quickly.

To the extent there are marginally higher costs for achieving the Green Communities Criteria, they are absorbed in the development budget. In many cases direct support from Enterprise and other sources that would not otherwise have been available to developments (i.e., if they were not green) helps bridge any higher costs. As noted. Enterprise's extensive evaluation efforts are generating data that show that we can create highly sustainable homes for low-income families such as these for only marginally higher development costs – 2 percent to 4 percent on average, and that costs can come down with experience. Critically, Enterprise's evaluation suggests that most of the marginally higher costs are attributable to measures that generate financial savings, such as energy and water efficiency features, or enable developments to properly plan an "integrated design," which has been shown to lower costs and enhance environmental performance in buildings.

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[i] See www.energystar.gov/index.cfm?c=new_homes.nh_benefits.
[ii] Only about 6 million of these households receive any form of federal housing assistance.
[iii] "America's Rental Housing: Homes for a Diverse Nation," Joint Center for Housing Studies of Harvard University (2006).
[iv] Ibid.
[v] Lisa Wilson Wright. Ph.D., "Results from Federal and State Evaluations: Energy Savings in Whole House Weatherization Programs, Energy Programs Consortium, January 2007.
[vi] "Green Jobs: Towards Sustainable Work in a Low-Carbon World," Worldwatch Institute (2008): 66
[vii] Raquel Pinderhughes, Ph.D., "Green Collar Jobs: An Analysis of the Capacity of Green Businesses to Provide High Quality Jobs for Men and Women with Barriers to Employment," City of Berkeley Office of Energy and Sustainable Development (2007).
[viii] *Green Jobs: Towards Sustainable Work in a Low-Carbon World*, Worldwatch Institute (2008).
[ix] "Weatherization Assistance Program: Improving the Economies for Low-Income Communities," U.S. Department of Energy (August 2006).
[x] "Community Jobs in the Green Economy," Apollo Alliance and Urban Habitat (2007).
[xi] Reicher, Ibid.
[xii] See www.energystar.gov/index.cfm?c=new_homes.nh_benefits.
[xiii] William Bradshaw et al., "The Costs & Benefits of Green Affordable Housing," New Ecology and the Tellus Institute (2005).
[xiv] Jennifer Thorne Amman, "Valuation of Non-Energy Benefits to Determine Cost-Effectiveness of Whole House Retrofits Programs: A Literature Review," American Council for an Energy-Efficient Economy (May 2006).
[xv] Statement of Rebecca Morley, MSPP, Executive Director, National Center for Healthy Housing Before the Environmental Public Works Committee United States Senate May 15, 2006.
[xvi] T.K. Takaro, MD, MPH, et., al., "Clinical Response in Asthma From Improved Housing Design and Construction," presentation at US Green Building Council's Greenbuild Conference, November 2007.
[xvii] "Income, Energy Efficiency and Emissions: The Critical Relationship," Energy Programs Consortium (February 26, 2008)
[xviii] Ibid.
[xix] Ibid
[xx] "Testimony of Dan W. Reicher, Director, Climate Change and Energy Initiatives, Before the Senate Committee on Finance" Google.org (February 27, 2007).
[xxi] John Podesta, Laura Tyson, Sara Rosen Wartell, "A Practical and Progressive Economic Stimulus and Recovery Plan," Center for American Progress (January 17, 2008).

THE SELECT COMMITTEE ON
ENERGY INDEPENDENCE AND GLOBAL WARMING

Dear Ms. Moore:
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

1) According to calculations done by *Environmental Building News*, commuting by office workers accounts for 30% more energy than the building itself uses. We need to think not just about energy efficiency, but about location efficiency – ensuring buildings are located in a place where people have transportation alternatives and access to services. In an era of high and rising gas prices, location efficiency is extremely important for low income families, who spend a significant amount of their income on transportation costs. Transportation costs currently account for 18% of the average U.S. household expenditures. By some estimates, the savings associated with living in a location efficient area can exceed $600 a month. How can we incorporate location efficiency into the standards that the US Green Buildings Council and Enterprise have created? Is this something we can take beyond just a few additional points of credit and consider in the underlying standards?

Answer: Recognizing the many impacts of project developments on ecosystems, local infrastructure, resource consumption, and vehicle use, LEED includes among the five principal areas addressed in the rating system a category promoting Sustainable Sites. This category emphasizes the importance of location to the efficiency and environmental performance of buildings.

USGBC recently released LEED 2009 for public comment. This latest version of LEED seeks to raise the bar for green building leadership by aligning prerequisites and credits across LEED rating systems. It also includes a "weighting" of LEED credits according to their ability to reduce negative environmental effects and enable positive ones, which would result in a greater emphasis on location and alternative transportation.

USGBC is also pilot-testing LEED for Neighborhood Development, a certification system developed in collaboration with the Natural Resources Defense Council and the Congress for the New Urbanism that integrates the principles of smart growth, new urbanism, and green building into the first national system for neighborhood design. With a greater emphasis on land use planning than other LEED rating systems, LEED for Neighborhood Development promotes the location and design of neighborhoods that reduce vehicle miles traveled, and communities where jobs and services are accessible by foot or public transit. It also encourages more efficient energy and water use, which are especially important in urban areas, where infrastructure is often overtaxed.

While in pilot-testing, LEED for Neighborhood Development includes 240 development projects in various stages of planning and construction across the country and in several other countries. Projects may encompass whole neighborhoods, fractions of neighborhoods, and multiple neighborhoods, and the pilot projects range significantly in size. The LEED for Neighborhood Development rating system can be applied to infill development and previously developed sites, as well as appropriate development of undeveloped land. Thus far, approximately 20 projects have submitted their documentation for certification, and 5 have completed certification. The information learned during the pilot program will be used to make further revisions to the rating system in 2008, and the resulting draft will be posted for public comment before it is submitted for final approval and balloting in 2009.

2) One area I've been involved in is location and energy efficient mortgages – getting Fannie Mae and Freddie Mac to credit mortgage applications for the savings generated by a transit-friendly location and energy efficiency, making it easier for homebuyers to buy these homes. Do you think that if Location Efficient Mortgages were more widely available and better understood that more families would take advantage of them?

Answer: Yes. In a recent survey conducted by McGraw Hill, respondents identified a lack of education and awareness as key obstacles to the purchase of a green home.[1] Educational outreach about the rewards and benefits of green homes, as well as about available financing options, would provide homebuyers and the public with the information and tools necessary to take advantage of these options. Additionally, legislative initiatives such as the Green Resources for Energy Efficient Neighborhoods (GREEN) Act of 2008 (H.R. 6078) help advance the market transformation to sustainability by:

- providing needed financing mechanisms, such as energy- and location-efficient mortgages, to assist consumers in accessing more efficient properties,
- providing needed education to consumers and lenders about the benefits of energy efficiency,

[1] McGraw Hill Construction SmartMarket Report (2007), *The Green Homeowner: Attitudes & Preferences for Remodeling and Buying Green Homes.*

- empowering the private market to move further and faster by advancing the federal commitment to green and energy efficient housing.

3) How can we better use the tax code to promote green buildings?

Answer: The green building movement has steadily benefited from the development of green technologies that improve the environmental performance of building materials and systems, and harness new sources of renewable energy. Tax incentives drive investment in these critical areas, providing industries and innovators with the funds that are necessary to undertake this innovative work. Congress can further promote green buildings by providing long-term extensions of the energy efficiency tax credits for new and existing homes and the manufacture of efficient appliances, as well as the energy efficiency tax deduction for commercial buildings, to ensure continued growth and stability in these sectors.

4) Mayor Newsome described San Francisco's efforts to ensure that its governmental centers are models of sustainability. Is this something that can be replicated at the Federal government level? Do you know what the Federal government has done in this area so far and how we can go further?

Answer: Since USGBC's founding, the federal government has been an important partner in advancing green building practices. As I mentioned in my written testimony, the U.S. General Services Administration—which is the nation's largest civilian landlord—requires new buildings and major renovation projects to achieve LEED certification. In 2006, GSA submitted a report by request of Congress that found that LEED "continues to be the most appropriate and credible sustainable building rating system available for evaluation of GSA projects." Eleven other federal agencies and departments have policies in place that require or encourage construction of LEED buildings.

USGBC commends the federal government for its leadership in advancing green building through its inclusion of several new initiatives in EISA, including:

- the Office of Federal High Performance Green Buildings within GSA and the Office of High Performance Green Commercial Buildings in DOE to coordinate green building research, information dissemination and other activities;

- the recently authorized energy efficiency and conservation block grant program to support states and local governments in reducing greenhouse gas emissions, reducing energy use, and improving energy efficiency; and

- the authorization of funding for a grant program for school environmental health programs and a study of indoor environmental quality in K-12 schools.

We support the robust funding of these initiatives as a means of spurring market transformation and encourage the federal government to continue its work to lead by example in the greening of the built environment.

5) Do you agree that much can be done and already is being done in the area of energy efficiency without federal intervention through local and state initiatives, building codes, private enterprises and charitable groups?

Answer: The public sector has demonstrated considerable vision and leadership in the transformation of the built environment. Currently, 12 federal agencies or departments, 28 states, 120+ local governments, 12 public school jurisdictions and 36 higher education institutions have made policy commitments to use or encourage LEED. Additionally, local officials throughout the country are demonstrating leadership in addressing climate change by promoting energy efficiency and other initiatives in their communities. More than 850 mayors representing more than a quarter of the U.S. population have now signed the U.S. Mayors' Climate Protection Agreement to support the goals outlined in the Kyoto Protocol. The federal government can play an important role in advancing these efforts by providing incentives and support to states and localities, and by serving as an example through its own leadership policies.

6) Has the EnergyStar program helped the building industry and consumers make better choices in appliances, heating and cooling systems? What other systems should also receive ratings similar to the EnergyStar program?

Answer: Energy Star is of great importance to the building industry and is a foundation of USGBC's LEED Green Building Rating System. The program continues to make great strides both in the commercial and residential marketplace, driven in part by the widespread recognition of the brand among consumers. Three specific ways in which it could be more highly leveraged toward driving greater efficiency in the industry at large would be to:

- utilize Energy Star building efficiency benchmarking tools to qualify for state and federal energy utility efficiency incentives,
- broaden the Energy Star program to encompass a wider range of property types (e.g., apartment buildings and shopping centers), and
- utilize Energy Star for Home Performance as a benchmarking metric for developing incentives for energy efficiency improvements to existing homes.

7) How does the energy usage break down between industrial, commercial, and residential buildings? Which sector do you see the most potential for efficiency gains?

Answer: Buildings account for approximately 39% of total U.S. energy use. Residential buildings account for roughly 54% of this sum, while commercial buildings account for the remaining 45%.[2] Each sector of the built environment presents opportunities for improving energy efficiency. Energy reduction strategies in these areas can be pursued in tandem.

8) The AIA now requires that its members take professional continuing education classes in sustainability (starting in January 2009), but many people in the building

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[2] *See* Department of Energy (Energy Information Administration), Annual Energy Review 2003.

trades, from contractors to maintenance workers, still do not receive the training they need in energy efficiency. How can we better educate all the stakeholders in the building industry in how to design, construct and operate energy efficient buildings?

Answer: Many professional societies in addition to AIA, including ASHRAE, ICC, and AGC, are developing educational requirements and certificate programs to recognize individuals with subject matter expertise in the principles of sustainable design, construction, and operation. Moreover, there are more than 50,000 building industry professionals and trades people who have earned the LEED Accredited Professional distinction in recognition of their expertise in the field. Investment in skills training through the existing Green Jobs Act, complemented by developing opportunities to expand trade education in high schools and community colleges, would be a tremendous boost toward educating all stakeholders. Our high schools, trade schools, and colleges are not graduating enough young people to serve the projected future need of the green building industry and of the construction industry overall. The building and construction industry offers increasingly highly skilled jobs that are not exportable by their very nature, and that can directly improve our nation's energy independence and contribute toward our response to climate change.

9) Overall, I think the development of voluntary standards such as the LEED standard are helping to move home and building construction in important and exciting new directions, and, clearly, enhancing energy efficiency in government buildings is an important step Congress can take in this effort. As you may know, the American Forest and Paper Association has submitted a written statement for the record in which it reiterates its concerns about the LEED standard. AFPA says that green building rating systems should fully recognize the environmental benefits provided by the use of wood products. It argues that, while the LEED system's point structure gives credit for wood products having the Forest Stewardship Council certification, it does not "recognize all credible, sustainable forestry certification programs," including "the two largest sustainable forest management systems in the U.S.," which apply to 100 million acres of U.S. forestland. AFPA also argues this leads U.S. builders to use mainly imported wood to meet LEED standards. How do you respond to these claims?

Answer: LEED's intent is to recognize and celebrate leadership as a means of fostering market transformation. As such, each of the "credits" in LEED seek to identify a leadership-oriented metric of performance that encourages the very best practices in design, construction, and building operation in that aspect of the building. USGBC's LEED Green Building Rating System includes a range of credits that recognize the contribution that wood and wood products can make towards a green building. Credits awarded for wood and wood products include locally manufactured products, recycled and reused materials, and formaldehyde-free wood products in addition to the credit awarded for FSC-certified wood, among the 69 credits available in LEED for New Construction. Since last year, USGBC has been in process of reviewing the credit awarded for FSC-certified wood to determine if and how other wood certification systems, such as the Sustainable Forestry Initiative (SFI), should be recognized within LEED. The question USGBC's consensus committees leading that effort have asked is how the various wood certification systems compare in terms of measured environmental performance. AF&PA,

together with many other stakeholders from among the timber industry, have been actively engaged in this process, including review and comment on documents and direct dialogue with the consensus body. USGBC anticipates that revised language around LEED's certified wood credit will be advanced for "public comment" toward adoption during mid-Summer. USGBC further anticipates that LEED's advancement toward integrating LCA (Life Cycle Assessment) based credits for materials and resources will allow wood and wood products to be recognized for additional credits towards the achievement of a LEED-rating.

10) How frequently do you expect to update LEED? How quickly can you take new technology into consideration when developing new standards?

Answer: The updated version of LEED, which is currently out for public comment, provides a continuous improvement structure that will enable USGBC to develop LEED in a predictable way, with revisions to the rating system every two years. However, policy mechanisms are in place to allow for LEED to react to the rapidly changing green building industry, including, but not limited to, administrative credit interpretations and the alternative compliance paths to existing LEED prerequisites or credits.

11) How much does the application for LEED certification cost? Is there a cost for a project team to register online with USGBC?

Answer: It is a common myth that it costs a lot to do LEED. It costs $450 to register under the commercial program and on average it costs $4500 to certify.

12) Do you take the regional environment into context when developing your standards? For example, a house in Minneapolis is going to necessitate much different construction materials than a house built in Atlanta.

Answer: LEED currently acknowledges regional differences through reference to widely accepted national standards that are regionalized. An example of such a regional standard is the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1. Additionally, LEED 2009, which is now out for public comment review, includes proposed regional bonus credits to further recognize the regional environmental priorities of LEED users.

13) With the increased attention on reducing greenhouse gases and initiatives like the architects' plan to make buildings carbon neutral by 2030, how do various ratings systems like LEED perform with regard to reducing energy use in buildings?

Answer: USGBC is a member of the 2030 Alliance, and supports the goal of Carbon-neutral buildings by 2030. Third-party studies, the most recent being a publication by the New Buildings Institute, demonstrate that building that have been LEED-certified under prior versions of the rating system perform on average at 35% greater efficiency that conventionally-constructed buildings. Buildings certified as LEED-Platinum (the highest level of LEED) regularly achieve a 50% improvement in energy efficiency. USGBC is in the process of updating LEED to significantly increase energy and CO2 performance of any LEED-certified buildings significantly beyond that threshold.

14) What are approximate costs differences between the levels of LEED certification for an average commercial building? What about the cost differences for your new residential standards?

Answer: It costs $450 to register under the commercial program and on average it costs $4500 to certify. On the residential side, it costs $150 to register and $250 to certify single family homes. Multi-family units cost $450 per building with certification costs at $0.035 /square foot.

15) What is the number one energy saver according to LEED standards?

Answer: The single greatest driver of energy efficiency is LEED's requirement to use an "integrated design" process. Integrated design demands that all of the professions involved in the building design, construction, and operations process – of which there are dozens – come together at the outset of a project to set integrated performance goals that are measured and verified throughout the project's lifecycle. It sounds simple, but making certain, for instance, that every building feature that affects energy performance – such as windows, site orientation, lighting systems, heating and cooling systems, roofing, and insulation – are all made with the goal of maximizing efficiency in mind is not "business as usual" in the design and construction industry. Successfully using LEED to drive energy efficiency and environmental performance is more about goals, metrics, and common sense than new technologies.

16) How important is third party certification in the standards process?

Answer: Third-party verification assures that performance goals are met. Specifically related to the building industry, project timetables are measured in years and involve a small army of professionals. If you do not measure and verify actual achievements against goals and drive accountability, the long march of time and "value engineering" can rob a building of its potential to save energy and reduce CO2 emissions, among other metrics.

17) Do you believe that standards can continue to be voluntary and be effective?

Answer: Leadership-focused standards can and have been both voluntary and effective. The success of LEED and similar programs in the residential industry has challenged the market to reach higher. Through their widespread adoption, these programs have created an opportunity to "raise the floor" through advancements in building codes and other mandatory measures.

18) Are there any regional differences taken into account as certifications are made – for example, you wouldn't want to cut down trees to put up solar panels, sandy soils might require different construction techniques for foundations, etc.?

Answer: To enhance the flexibility of LEED and provide a more effective method of addressing the need for regional adaptation, the version of LEED currently out for public comment proposes the introduction of Regional Bonus Credits to increase the value of pursuing credits that address environmental areas of concern in a project's region. USGBC Chapters and Regional Councils

are playing a crucial role in this effort, based on their knowledge of issues of concern in their locales.

19) What do you think the most important R&D needs are in building design for efficiency?

Answer: USGBC brought together leaders in the academic community to identify the research needs for green building. Released in November 2007, this national research agenda is intended to identify and catalyze funding, research, development, and deployment activities that are necessary for achieving a transformative leap in building performance and sustainability. A key function of this agenda is to serve as a basis of discussion for multiple disciplines and funding sources, providing direction and context within a cohesive mission. The research agenda identifies a number of program areas to which additional funding should be applied, including: Materials Life Cycle Assessment; Passive, Active and Hybrid HVAC Controls; Lighting and Daylighting; Building Form and Envelope; Land Use, Building Location, and Transportation; Performance Metrics and Evaluation; Indoor Environmental Quality; and Water Use and Management, among others.

20) Did any government funding go into the creation of LEED standards?

Answer: USGBC as an organization is more than 95% earned income driven, which is to say that we earn our own keep based on the value we are able to deliver to the building community toward the achievement of our mission. It has been important to our Board of Directors since our founding that no single financial interest dominates the organization. At different stages in its development, private foundation and government grants have helped to establish new USGBC programs, including LEED. In its earliest days, for instance, a generous grant from the Department of Energy enabled USGBC to initiate the development of and ultimately launch the LEED Green Building Rating System. EPA and GSA have also provided grants for the development of new LEED rating systems. Our working relationship over the years has been an excellent example of a successful public-private partnership.

21) Since local municipalities and school districts are responsible for financing and constructing schools, shouldn't the Federal Government stay out of the business of micromanaging building new schools?

Answer: Throughout the nation, children are expected to learn in classrooms and schools that are substandard and dangerous. The federal government can play a role in educating state and local officials about how to maximize scarce education resources by cutting school utility and operations costs, while nurturing student and teacher health, creating an ideal learning environment, and helping to secure our nation's energy future. There is also an opportunity to assist schools in this process where financing is not available.

22) Could you explain how the LEED criteria are developed and how this process differs from a consensus standard that is approved by a third-party Standards Developing Organization, like the American National Standards Institute?

Answer: USGBC is an ANSI-accredited standards developer. USGBC is participating in the ANSI standards development process for NAHB's green home standard and for ASHRAE's Standard 189p, which will be commercial green building code. USGBC has committed to ANSI certification for its LEED Accredited Professional Program, and recently filed its intent to advance LEED for Existing Buildings: Operations and Maintenance and LEED for Neighborhood Development as ANSI national standards. Additionally, USGBC engages an open, inclusive and democratic "consensus body" in the development of all versions of LEED.

23) Does your organization support mandates (national, state or local) for the LEED rating system and certification program?

Answer: USGBC supports the adoption of LEED by governmental entities for their own buildings and for buildings in which the government is investing funds. USGBC also supports incentives for using LEED. Several municipalities, through a local consensus process, have made a decision to require LEED for private sector commercial buildings within their jurisdiction as well. USGBC has not been an advocate for private sector LEED mandates, because LEED was created and continues to be advanced as a way to recognize leadership. USGBC partnered with ASHRAE, IESNA, and AIA to create Standard 189p as a tool for mandating mainstream green building practices through building code.

24) There are many national organizations, states, and local governments that are voluntarily pursuing their own green building initiatives. How does your organization recognize and/or accommodate these existing state and local initiatives?

Answer: USGBC is a mission-oriented nonprofit with a vision of a sustainable built environment within a generation. We believe that a rising tide raises all boats, and that consensus development, together with measurement and verification of the results, is essential to collaboration toward achieving our vision. As such, we work collaboratively with many organizations with harmonious values and vision, not only through the advancement of LEED, but also through our 77 local chapters, our Greenbuild conference, and our expansive educational programs and publications. USGBC serves or has served on the development committees for ASHRAE's Standard 189p and NAHB's green home standard. Additionally, we have worked collaboratively with Enterprise Community Partners on their Green Communities Program and with the American Society of Interior Designers (ASID) on the development of the REGREEN Guidelines for green remodeling – just to name a few examples.