# GREEN BUILDINGS OFFER MULTIPLE BENEFITS: COST SAVINGS, CLEAN ENVIRONMENT, AND JOBS

**(111–51)**

## HEARING

BEFORE THE

SUBCOMMITTEE ON
ECONOMIC DEVELOPMENT, PUBLIC BUILDINGS, AND
EMERGENCY MANAGEMENT

OF THE

COMMITTEE ON
TRANSPORTATION AND
INFRASTRUCTURE
HOUSE OF REPRESENTATIVES

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# U.S. House of Representatives
## Committee on Transportation and Infrastructure

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July 14, 2009

**SUMMARY OF SUBJECT MATTER**

**TO:** Members of the Subcommittee on Economic Development, Public Buildings, and Emergency Management

**FROM:** Subcommittee on Economic Development, Public Buildings, and Emergency Management Staff

**SUBJECT:** Hearing on "Green Buildings Offer Multiple Benefits: Cost Savings, Clean Environment, and Jobs"

### PURPOSE OF THE HEARING

The Subcommittee on Economic Development, Public Buildings, and Emergency Management will meet on Thursday, July 16, 2009, at 2:00 p.m. in room 2167 of the Rayburn House Office Building to review the benefits of "green" buildings and the General Services Administration's (GSA) unique opportunity to bolster the new "green" economy.

The Subcommittee will examine "green" job training that will help assist GSA in servicing green buildings. The Subcommittee will also examine the requirements of the Energy Independence and Security Act of 2007 (EISA) (P.L. 110-140) not only for GSA, but also for private sector facilities. EISA mandated a reduction in energy consumption in most Federal agencies and is used as the basis of guidance provided to GSA building managers regarding energy efficiency and conservation.

### BACKGROUND

The GSA handles an extensive real estate portfolio. GSA owns more than 1,500 Federal buildings totaling 176.5 million rentable square feet of space. GSA leases 177.5 million rentable square feet of space in almost 7,100 leased properties. The functional replacement value of the GSA portfolio is about $41.7 billion. GSA's utility costs are expected to be between $475 and $500 million in 2009.

## I. GSA Green Building and Construction

GSA has an impact not only on the real estate industry, but also on the energy industry through the consumption of energy in Federal facilities. Energy efficiency and conservation promote a healthy environment and help to protect our limited natural resources. The Federal approach to energy efficiency and conservation incorporates many "green" building concepts, such as heating and cooling, use of solar panels, cold-climate windows, warm-climate windows, landscaping, weatherization, compact fluorescent bulbs, use of energy star products, and outdoor lighting. All of these measures impact the consumption of energy and have a significant impact on energy policy.

## II. The American Recovery and Reinvestment Act

The American Recovery and Reinvestment Act (Recovery Act) (P.L. 111-5) appropriated $5.55 billion for GSA construction and alteration projects, with a focus on "green" building initiatives. On March 31, 2009, the GSA Public Building Service Spending Plan was released and highlighted the spending in the Recovery Act that was dedicated towards transforming Federal buildings into high performance green buildings. The total amount allocated was $4.3 billion to over 200 projects across the country. The purpose of these funds is to make Federal buildings more energy efficient and, where possible, to use renewable energy generation.

The Public Building Service Spending Plan includes both full and partial modernization projects. The array of projects being deployed by the Public Building Service include the installation of meters for electricity, water, and steam; photovoltaic roofs; cool roof membranes; building tune ups and re-commissioning; heating, ventilating, and air conditioning (HVAC) retrofits; water conservation projects; and other energy projects.

As GSA moves towards a more "green" building inventory, the Subcommittee will continue to examine GSA's ability to manage and operate these newly modernized buildings. Today's hearing will also examine how the Recovery Act is encouraging training for new "green" jobs and how the new "green" economy will potentially affect the commercial real estate market.

## PRIOR LEGISLATIVE AND OVERSIGHT ACTIVITY

The Subcommittee has previously held several hearings specifically on sustainability and green buildings. On May 11, 2007, the Committee on Transportation and Infrastructure held a hearing on "Administration Proposals on Climate Change and Energy Independence". Acting Architect of the Capitol Stephen Ayers and Chief Administrative Office Daniel Beard testified at this hearing regarding energy efficiency and climate change mitigation initiatives in the Capitol Complex.

On June 20, 2007, the Committee on Transportation and Infrastructure ordered reported H.R. 2701, the "Transportation Energy Security and Climate Change Mitigation Act of 2007". The bill included several provisions to promote energy efficiency of the U.S. Capitol Complex and in Federal buildings under GSA's jurisdiction, custody, and control. The following provisions from H.R. 2701 were incorporated into EISA: sections 431 through 441 are devoted to High Performance Federal Green Buildings; section 436 specifically directs the Administrator of General Services to establish in GSA an Office of Federal High-Performance Green Buildings and to

develop more energy efficient "green" commercial buildings; section 421 creates the Department of Energy Commercial Office of High-Performance Green Buildings; and section 422 established a zero energy commercial building initiative.

On April 1, 2008, the Subcommittee on Economic Development, Public Buildings, and Emergency Management held a hearing on the Capitol Complex Master Plan (Plan) and the Capitol Visitor Center, with a focus on transportation, security, greening initiatives, energy, and maintenance. The Plan contains a sustainability component that calls for implementing sustainable operations practices and procedures to reduce the environmental and carbon footprint of the Capitol Complex using renewable and alternative forms of energy, like photovoltaic, wind power, and fuel cells. In addition, the Plan would create and implement policies to encourage green purchasing. Within the Plan, the Sustainability Framework Plan also calls for energy, water, and waste audits for the facilities of the Capitol Complex to promote efficiency, while also pursuing cleaner sources of fuel to reduce the Capitol Complex contribution to air pollution in the Washington, D.C. metropolitan area.

On April 17, 2008, the Subcommittee held a hearing on greening initiatives for Washington, D.C. and the National Capital Region. The hearing focused on current trends and future initiatives regarding facility management, which increasingly includes concepts of sustainability and how "green" buildings contribute to sustainability. The hearing also focused on all aspects of the "green" building process, including construction, renovation, alteration, operation, and maintenance. Finally, the hearing examined several recently constructed "green" buildings in the Washington, D.C. metropolitan area.

WITNESSES

**Mr. Kevin Kampschroer** KAM
Acting Director
Office of Federal High-Performance Green Buildings
General Services Administration

**Dr. Drury Crawley** CRA
Lead Mechanical Engineer
Office of Building Technologies
U.S. Department of Energy

**Mr. Ray Uhalde** UHA
Senior Advisor
United States Department of Labor

**Mr. James L. Helsel, Jr.** HEL
Treasurer
National Association of Realtors

# HEARING ON GREEN BUILDINGS OFFER MULTIPLE BENEFITS: COST SAVINGS, CLEAN ENVIRONMENT, AND JOBS

**Thursday, July 16, 2009**

HOUSE OF REPRESENTATIVES
SUBCOMMITTEE ON ECONOMIC DEVELOPMENT, PUBLIC BUILDINGS AND EMERGENCY MANAGEMENT,
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
*Washington, DC.*

The Subcommittee met, pursuant to call, at 2:00 p.m., in Room 2167, Rayburn House Office Building, the Honorable Eleanor Holmes Norton [Chair of the Subcommittee] presiding.

Ms. NORTON. I want to welcome all of you to today's hearing with particular appreciation to our distinguished witnesses for their testimony. The Subcommittee will examine plans for green buildings and the benefit to energy conservation and climate change in today's world.

Since becoming Chair of this Subcommittee, I have been plain that one of my priority goals is to maximize the GSA's outsized real estate and property portfolio to make the Agency the green buildings leader in the Country. My first hearing as Chair focused on the greening of Washington, D.C. and the national capital region because GSA is the leader in the office building market here.

The GSA has long engaged in energy conservation efforts, well before climate change issues became prominent, because the Agency has understood the energy value and savings to the taxpayer. However, with a new Administration taking unprecedented leadership on conservation and climate change, we are seeking ways to build on the progress we began in the 100th Congress.

We began that progress, of course, with the pathbreaking Energy Independence and Security Act of 2007. I am pleased that, among other things, the bill authorized high efficiency light bulb replacements, a photovoltaic provision, and the creation of an Office of High-Performance Green Buildings for the first time that is required to coordinate with the Department of Energy, which is focusing on green issues in the private sector. I am pleased that today we will hear from both the GSA Office of High-Performance Green Buildings as well as from the Department of Energy.

As important as these breakthrough initiatives were, they seem timid in light of GSA's potential impact, especially on leasing but also on its own inventory and on the economy and climate change in the Nation. The President was of the same mind when he worked with our Subcommittee to place in the Stimulus Package

$5.5 billion, most of it for repair and rehabilitation of GSA's badly deteriorated inventory. Much of it should be used on energy conservation. In addition, we achieved through the Stimulus at least the bulk of the funding that was needed for the first building in the new Department of Homeland Security headquarters compound to be located on the old Saint Elizabeth's west campus.

The DHS headquarters provides a unique opportunity for the Government to build an entirely green set of office buildings, the largest construction in GSA's history. With a little imagination, the potential for energy conservation at the new headquarters is bountiful.

Green building activities generally cover products and practices that conserve energy and water, promote clean indoor air, protect natural resources, and reduce the impact of a building on a community. Examples include insulation such as double paned windows that reduce or conserve the heating loads of buildings and positioning buildings in order to reduce the need for cooling or heating the building. Green building includes reduced flow toilets and low water plants and landscaping. Green building improves the indoor environment with use of non-toxic caulks and adhesive, non-formaldehyde cabinets, and the use of filters. Green building protects natural resources by promoting the use of products with recycled content like carpet, tile, and wallboard while promoting the use of rapidly renewable products like bamboo flooring and natural linoleum. Green building protects waterways like the Anacostia River and the Chesapeake Bay by promoting practices that reduce the impact of structure on the environment such as mitigating the effects of stormwater runoff by using green roofs, cisterns, and permeable pavers; locating buildings close to mass transit; and including bike racks and storage units.

With GSA in the throes of redoing its existing inventory, or at least part of it, in all 50 States, the District of Columbia, and all the territories and with its emphasis in that work on energy conservation, along with its work now on the new headquarters and the Agency's own position in the leasing market, the Subcommittee is especially interested in new frontiers not only in green thinking but particularly in green action steps that can be taken now.

We are interested in greening and conservation practices in the work we will be undertaking, for example in reusing water and energy in various types of green roofs, especially for our existing buildings. We are interested in the difference and value among various LEED designations in energy savings technology and in reducing practices that harm the environment in constructing and leasing near waterways.

We, of course, want to draw on the rapidly developing data that allow us to compare cost to benefit and allow us to know cost reductions that are actually resulting. Equipped with the largest footprint in the private leasing market in the United States and with one of the most consistent presences in the construction market, GSA must not let these opportunities slip away. It is has resources at a level it has not had before at one time to do its work.

Our goal is to invigorate the Federal leadership role in green technologies, greening strategies, and high energy standards in all new construction, major replacements, and repairs. Using its new

resources, one of a kind, GSA must now become the trend setter it is capable of being, particularly in spin-off and green job creation and job opportunities during today's recession.

We are very pleased to welcome today's witnesses and hear their testimony. We are just as pleased to hear from our Ranking Member, Mr. Diaz-Balart.

Mr. DIAZ-BALART. Thank you very much, Madam Chairwoman. I want to thank you again for your leadership in holding this hearing today to examine green buildings and the Green Building Initiative. I want to thank the distinguished panelists for being here as well.

The Energy Policy Act of 2005 and also the Energy Independence and Security Act of 2007 set standards for Federal buildings and required them to meet certain conservation goals. For example, these laws require energy consumption in Federal buildings to be reduced by 30 percent in 2015 and their use of fossil fuel generated energy to be reduced from 55 percent in 2010 to zero in 2030. They are very ambitious goals. Similar zero net energy consumption goals for the commercial sector are also encouraged in these laws.

The Department of Energy was also tasked to work with the private sector to identify and develop cost-effective technologies in order to reach those ambitious goals. The Office of Federal High-Performance Green Buildings was established within GSA and it was to coordinate with the Department of Energy on those efforts, to coordinate green building activities within the GSA, and to develop standards for Federal buildings across the board.

Evidently the statutory framework enacted by Congress envisions increased conservation not only in the public sector but also in the private sector. Obviously, to carry out these efforts, a number of Federal agencies need to coordinate. This is in addition to partnerships with private sector organizations such as the U.S. Green Building Council, which established the LEED certification used to designate the efficiency level of commercial buildings.

It is also very important to highlight the fact that the requirements set by the 2007 Act actually go much further than just promoting energy conservation, however. I have mentioned this in other hearings, that the Act sets very strict requirements on Federal buildings related to the reduction of energy, water, and material resource use; improving indoor environmental quality, including acoustic environments; and also considering the indoor and outdoor effects of buildings. Again, it is more than just conservation.

Now, while steps are being taken to meet conservation goals including the use of LED lighting systems, advanced metering, insulation, weatherization, and a number of other technologies, the requirements under the Act extend well beyond conserving energy. I think it is important to note that. So I really look forward to hearing from the witnesses today about all of those requirements needed for a green building and about identifying where GSA is on meeting those requirements of the 2007 Act. Again, they are very broad requirements.

In addition, the American Recovery and Reinvestment Act, the so-called Stimulus Act, passed earlier this year. It included $5.5 billion for the GSA Federal Building Fund and designated $4.5 billion for "measures necessary to convert GSA facilities to high-per-

formance green buildings." Now, as I have stated many times before, I clearly support efforts to reduce energy consumption and to examine ways in which the Federal Government can help minimize the environmental impact of its facilities. That is obviously a very meritorious and worthwhile goal. I have also stated before, however, that I believe that such efforts must be first scientifically based and proven. Technologies must be scientifically proven and based and done in such a way that they support American industries and—here is the big one—create jobs.

I expressed concern in previous hearings that the focus of GSA funding, including of the Recovery Act or the Stimulus Act, is on greening Federal buildings instead of creating jobs. The two objectives clearly, in my view, are not mutually exclusive. But particularly with that stimulus funding, the priority has to be creating jobs. They are not mutually exclusive but that has to be the priority. We cannot lose that perspective.

I do hope, as Acting GSA Administrator Paul Prouty indicated before this Committee in April, that these projects will, according to him, stimulate job growth in the construction and real estate sectors and long term improvement in energy efficiency technologies.

We have seen it. We have read it in the news. It is common knowledge that Recovery efforts have not worked. The bill has not worked. We were promised that unemployment would be capped at 8 percent if the bill passed. We are now at 9.5 percent. In my State of Florida, it is 10.2 percent. We were promised the creation of 3.5 million jobs when in fact we have lost 2 million jobs since the bill was enacted.

If I was concerned before, I think there is more reason now to be concerned about making sure that we emphasize creating jobs. Obviously something went clearly wrong, drastically wrong, dramatically wrong with that bill, the implementation of the bill, or the creation of the bill.

I am very pleased however, to have witnesses here today who may be able to outline for this Committee how many jobs have been created through these efforts. Again, I am a strong believer that construction does help create jobs. What industries have been supported? How we can reach both improved energy efficiency, which as I said before is very meritorious and needed, as well as job creation and job growth? So I look forward to hearing from the witnesses on these and other issues.

I once again want to thank the Chairwoman for her leadership and for making sure that we continue to not only do oversight but continue to lead on these issues that are greatly important to our Nation. Thank you, Madam Chairwoman.

Ms. NORTON. Thank you very much, Mr. Diaz-Balart.

We are pleased to have other Members present. I want to ask if they have any brief opening statements. Mr. Walz of Minnesota?

Mr. WALZ. I will yield back my time, Madam Chairwoman, so we can hear the witnesses.

Ms. NORTON. Thank you, Mr. Walz.

Ms. Fallin?

Ms. FALLIN. Thank you, Madam Chairwoman. I am not going to be able to stay for the whole hearing so I wanted just to make a

couple of quick comments. I am going to submit my questions for the record and they can be answered later. But I just want to make a couple of quick comments.

Ms. NORTON. So ordered.

Ms. FALLIN. Thank you so much. Ranking Member, I appreciate your time here today, too. I appreciate all of our people who have come to testify on the very important subject of green buildings and how we can assist the GSA and private sector facilities in becoming more energy efficient and cost-effective.

I am very hopeful that through this hearing we can gain insight into what programs we currently are seeing that are successful and what programs we see that may need some improvement. I am also very interested in how the GSA is implementing the cost-effective technology acceleration program put forth by the Energy Independence and Security Act.

I have had some particular questions from some companies in my State of Oklahoma, very specifically from Climate Master in my district, that wanted to gain some information about a particular section in the Energy Independence and Security Act that has been implemented rather slowly. I have an interest in how we can use geothermal heat pumps, which I think are both cost and energy efficient, to meet some of the energy goals that are implemented in this legislation.

I think all of us in this room agree that using efficient technology can lead to greater cost savings as well as significant benefits to our environment. As we decide which energy efficient ways to construct and run these buildings using our taxpayer dollars, we should also ask ourselves if we are saving taxpayers and businesses as much money as possible by delivering energy in an efficient manner and using the latest in technologies.

As we proceed with this hearing, Madam Chairwoman, I would just like to have the GSA—and I may not be here at the time but for the record I will submit my questions—but I just would like to know how we are progressing in geothermal heat pumps to meet some of the goals in the Energy Independence and Security Act. I wonder if we can at some point in time have a list of the buildings that the GSA is considering putting the geothermal heat pump technology in, which ones have been selected, and how we are working with the industry in these particular sections.

That is really all I wanted to add today. Thank you, Madam Chairwoman.

Ms. NORTON. Thank you, Ms. Fallin. Mr. Carnahan of Missouri?

Mr. CARNAHAN. Thank you, Madam Chairwoman and Ranking Member Diaz-Balart, for holding this important hearing on the benefits of green building.

I am also co-founder with Congresswoman Judy Biggert of the High-Performance Buildings Caucus. We have advocated not just for green buildings but for high-performance buildings.

High-performance buildings incorporate the holistic systems approach of energy efficiencies, water savings, use of recycled and recyclable materials, life cycle analysis, and other environmental attributes into designs that are accessible, safe, secure, resilient, and oftentimes historically preserved. These high-performance buildings are not just examples of raw technical ingenuity, they are also in-

herently designed to decrease consumption and thus the overall cost of the building over the course of its lifetime.

I believe the Federal Government should lead by example in the way we construct and manage our Federal building stock by investing in high-performance buildings. We not only help bring about much needed economies of scale for these technologies but we also support highly skilled construction workers, builders, architects, and maintenance engineers, just to name a few.

By designing and building high-performance buildings, we reduce energy consumption and our carbon footprint. We save both water and raw materials. We save demolition and construction debris from going into landfills. Most importantly, high-performance building construction creates good paying green jobs that give workers the valuable skills they need to excel in a clean energy economy.

I would like to give special thanks to the High-Performance Building Congressional Caucus Coalition who, at my request, produced detailed recommendations for producing high-performance Federal buildings. These recommendations focus on requiring true life cycle analysis for the acquisition of Federal buildings and requiring total building commissioning using building information modeling and integrated project delivery. I would also like to ask unanimous consent that these recommendations be submitted for the record.

To the witnesses before us today, I want to thank you for taking the time to be here before this Committee. We look forward to working with you and hearing your testimony.

Ms. NORTON. Without objection, so ordered.

[The referenced information follows:]

**HIGH-PERFORMANCE BUILDING CONGRESSIONAL CAUCUS COALITION**

--www.HPBCCC.org--

**Producing High-Performance Federal Buildings**

As Congress evaluates opportunities to impact the energy use of Federal buildings, the Executive Committee of the High Performance Building Congressional Caucus Coalition (www.hpbccc.org) developed the following recommendations which, if implemented through upcoming energy legislation, will provide an effective transition to reduced energy consumption, enhanced sustainability, improved building operation and maintenance, and more efficient use of national resources in the Federal building stock.

Achieving energy reduction, enhanced sustainability, improved operation and maintenance, and effective use of resources in the federal building stock requires addressing the diversity of goals associated with high performance buildings including: accessibility, cost-effectiveness, function and operation, historic preservation, productivity, safety and security, and sustainability.

Efforts to enhance the energy and sustainability of Federal buildings must proceed within the context of traditional design requirements for safeguarding life, health, property, and public welfare. In order to avoid unintended consequences to building user's health and life-safety, energy efficient/sustainable design guidelines and standards recommended for federal building projects should take into account existing building and fire code requirements, avoid creating conflicts with those requirements, and where necessary, include recommendations for coordinating modifications to such safety-related codes and standards.

***Require True Life-Cycle Analysis and Decision-Making for the Acquisition of Federal Buildings.***

The American Institute of Architects (AIA) defines life-cycle cost analysis as, "any technique which allows assessment of a given solution, or choice among alternative solutions, on the basis of considering all relevant economic consequences over a given period of time." One of the major impediments to innovation and significant reductions in energy consumption in the Federal building stock is the separation of financial accounting for acquisition from operations. That is, there is a congressional approved budget for acquisition and a totally separate budget for yearly operations. Often the responsibilities for these budgets are in two separate organizational elements with different leadership and reporting responsibilities. This means that any investment in innovation that increases first (acquisition) cost while substantially reducing long-term cost (operations) is not considered. This fundamental dichotomy (caused by parallel separations in internal management and accounting procedures) creates a misalignment between setting the goals for a high-performance building and achieving those goals.

Making full life-cycle costs of a building project part of the life-cycle analysis and decision-making processes will provide a major step toward the acquisition of true high-performance Federal buildings.

***Require Total Building Commissioning for the Federal Building Stock.***

All Federal buildings should be required to utilize total building commissioning, re-commissioning, retro-commissioning, and post-occupancy-evaluations to include the documentation of owner performance requirements, design intent and justification, verification and validation of actual building performance, including the comprehensive training of operations and maintenance staff through the adoption of ASHRAE *Guideline 0:2005 The Commissioning Process*. The requirement to include documentation of lessons learned from post-occupancy-evaluations would provide significant increases in quality control for "green" buildings, including the validation of design strategies and decisions to improve building performance, the verification of actual building performance, the documentation of design intent to be used by building operations staff, and the development and implementation of a comprehensive training program for operations and maintenance staff.

***Require Integrated Project Delivery including Whole Building Design, Procurement, and Construction for Federal Buildings.***

Integrated Project Delivery (IPD) is an approach that brings together the relevant parties (designer, builder, owner, contractors, operations and maintenance teams, etc.) as well as the necessary systems, business structures, and practices at the beginning of portfolio development and continues through the life of the building. This collaborative approach harnesses the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, construction, and occupancy. The requirement for a collaborative process will help owners meet the increasingly aggressive goals for energy and carbon reduction, facilitating the complex interaction of systems and context in order to achieve significant energy-use reductions in projects.

Integrated delivery will strengthen the project team's understanding of the owner's desired outcomes, thus improving the team's ability to control costs and manage the budget, all of which increase the likelihood that project goals, including schedule, life-cycle costs, quality, and sustainability, will be achieved. Integrated delivery allows constructors to contribute their expertise in construction techniques early in the design process resulting in improved project quality and financial performance during the construction phase. Utilizing an integrated delivery approach changes the typical fee structure to allow for participation of all parties throughout the design process. Provisions must be considered to allow implementation of this important practice.

***Require Building Information Modeling and Support Building Data Interoperability for Federal Buildings.***

A Building Information Model (Model) is a digital representation of the physical and functional characteristics of a facility. It serves as a shared knowledge resource for information about a building, forming a reliable basis for decision-making throughout the life-cycle of the building from inception through deconstruction. A basic premise of Building Information Modeling (BIM) is collaboration by different stakeholders at different phases of the life-cycle of a facility to insert, extract, update, or modify information in the Model to support and assist in the decision-making of each stakeholder. The Model is a shared digital representation founded on open standards for interoperability.

Non-value added effort, or waste, is a significant problem in Federal buildings. Much of the waste comes from the inaccuracy of transferred information, resulting in information having to be re-gathered multiple times throughout the life of the building. As much as 57% of time, effort and material investment in construction projects do not add value to the final product according to a study by the Construction Industry Institute (CII) and Lean Construction Institute (LCI). The private sector building industry is finding benefit in BIM implementation and is pushing forward at a rather rapid rate for this traditionally conservative industry.

The scope of BIM ranges from the smallest building component expanded to the world or portfolio view, from inception onward in the life-cycle of a facility, and includes all stakeholders who need facility information from the designers to the occupants.

Federal agencies should adopt and implement the National BIM Standard so that the collection, maintenance, and use of building information become an integral part of the entire life-cycle of Federal buildings.

***Require Comprehensive Education and Training and Higher Levels of Competence in the Federal Building Design, Property Management, Operations and Maintenance, and Procurement Communities.***

Surprisingly, a large number of high performance building systems do not work as designed, largely because they do not receive proper building management, operations, and/or maintenance. Education and training must be conducted for all Federal employees with a focus on their particular roles within the organization—whether as project managers, building occupants, facilities management personnel, or procurement officers. Cross-agency and cross-discipline training should be promoted to share experiences and more effectively utilize limited resources. All senior Federal real property managers must receive the requisite education and the proper training and tools to do their jobs effectively. Requiring relevant personnel certifications can assure employees have the up-to-date body of knowledge to fulfill their responsibilities.

Ongoing training and education is essential to counter employee turnover and keep employees abreast of best practices. Procurement and portfolio managers in particular should receive a broad level of training with modules on life-cycle costing, specifying appropriate criteria in requests for proposals, available energy saving technologies, and a range of energy savings contracts and opportunities.

***Require the Collection, Storage, Dissemination, and Utilization for Federal Building Performance Data.***

The Federal sector encompasses a vast array of building types. However, there is no national database containing information on the stock of U.S. Federal facilities, their energy-related building characteristics, and their energy consumption and expenditures. Such a program would require the Federal agencies to collect and monitor their resource consumption data, compile it together with other agencies, allow open analysis and comprehensive decision-making, and use it to provide a framework for progressing toward significant resource savings required in existing legislation. This Federal building performance database and clearinghouse would provide for the accurate and actual measurement of energy use in specific Federal buildings, verify the actual building performance of specific Federal buildings, serve as a more accurate and appropriate baseline for Federal building energy performance in future legislation, allow for an improved analysis of different types of Federal buildings in order to better evaluate actual sector building use, and document the energy and environmental impact of building products.

The database and clearing house would thus provide a cradle-to-grave accounting of the energy and material flows into and out of the environment that are associated with Federal buildings and their systems, assemblies, materials, and components, allowing informed decisions to be made to create truly high performance Federal buildings.

The Federal Energy Management Program (FEMP) was established to help federal agencies reduce building energy use and procure renewable energy. Because FEMP's budget has been cut over the years (when energy was not a priority), it now lacks the authority or resources to provide this critical mission. Legislation is needed to restore FEMP to its original stature within DOE and among the federal agencies and authorize appropriations commensurate with its responsibilities in assisting agencies with the implementation of Executive Orders 13123 and 13423, EPACT 05, EISA 07, and other tasks as needed. Such tasks include collecting, storing, and utilizing data on actual building energy consumption and related greenhouse gas emissions government-wide and providing training on a wide range of topics, from product procurement to integrated project delivery and the whole building design approach. FEMP should coordinate with GSA's Office of Federal High Performance Green Buildings.

As Congress considers legislation focused on implementing High-Performance Federal Buildings, the membership of the High-Performance Building Congressional Caucus Coalition stands ready to offer technical expertise and guidance on the steps necessary to reach the nation's goals.

**High-Performance Building Congressional Caucus Coalition Executive Committee**
American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE)
Air Conditioning Contractors of America (ACCA)
Air Conditioning, Heating and Refrigeration Institute (AHRI)
American Institute of Architects (AIA)
American National Standards Institute (ANSI)
Building Owners and Managers Association (BOMA)
The Green Building Initiative (GBI)
International Code Council (ICC)
International Facility Management Association (IFMA)
National Electrical Manufacturers Association (NEMA)
National Fire Protection Association (NFPA)
National Institute of Building Sciences (NIBS)
U.S. Green Building Council (USGBC)

Ms. NORTON. We are fortunate to have here the ultimate leader on these matters, the Chairman of our full Committee, Mr. Oberstar, whom I ask if he has any opening remarks.

Mr. OBERSTAR. I thank you, Madam Chair and Mr. Diaz-Balart, our partner in these endeavors. Thank you for the considerable endeavor you have put in and the time that you have committed to maintaining watch over our portion of the energy bill. This is a down payment on the continuing oversight this Committee will conduct with the portions that we included in the energy bill to pass the House in 2008 and with our portion of continuing oversight of the Recovery Act.

The Federal Government has a great opportunity to take a leadership role, as Ms. Norton's opening statement cited. I think the questions raised by Ms. Fallin are very pertinent and very important. I look forward to your responses. But we are way behind the curve of other countries on the greening of our economy and on doing what the Federal Government, the national Government, can and should be doing.

Over 25 years ago, the province of Ontario had a program in which the province surveyed all of its government buildings and evaluated their energy needs and requirements, their cost, and the savings that could be achieved. It also mounted a program for communities, businesses, and home owners. They conducted energy audits all throughout the province of Ontario and made recommendations to home owners, business owners, and local governments to improve the energy efficiency of their facilities. They saved enormous amounts of money.

Ontario is a big, sprawling province that covers the land territory of seven U.S. States. They have a unique encounter with winter, as my district does. The glacier retreated 15,000 years ago but every December it stages a comeback. So it is very important for Ontario and for all of Canada to be energy efficient, particularly in the wintertime. Well, we have that responsibility here.

The purpose of this hearing and subsequent ones will be to measure the effectiveness of the GSA's management of our 350 to 360 million square feet of Federal civilian office space and those 174,000 vehicles that GSA operates annually to assure that we are leading, not just following but leading the way in energy efficiency.

Thank you, Madam Chair. I look forward to the witness testimony.

Ms. NORTON. Thank you, Mr. Chairman. I appreciate your leadership throughout your work in this Committee and especially on this new transportation bill. We are a very green Committee, not just a green Subcommittee.

I am very pleased now to hear from the witnesses in the order in which they appear.

Mr. Kampschroer is the Acting Director of this new Office of High-Performance Green Buildings in the GSA. Mr. Kampschroer?

**TESTIMONY OF KEVIN KAMPSCHROER, ACTING DIRECTOR, OFFICE OF FEDERAL HIGH-PERFORMANCE GREEN BUILDINGS, GENERAL SERVICES ADMINISTRATION; DRURY CRAWLEY, LEAD MECHANICAL ENGINEER, OFFICE OF BUILDING TECHNOLOGIES, U.S. DEPARTMENT OF ENERGY; RAY UHALDE, SENIOR ADVISOR, U.S. DEPARTMENT OF LABOR; AND JAMES L. HELSEL, JUNIOR, TREASURER, NATIONAL ASSOCIATION OF REALTORS**

Mr. KAMPSCHROER. Thank you, Madam Chair, Ranking Member Diaz-Balart, Chairman Oberstar, and Members of the Committee. My name is Kevin Kampschroer and, as you mentioned, I am the Acting Director of the Office of Federal High-Performance Green Buildings in the U.S. General Services Administration. Thank you for inviting me today to discuss the benefits of green buildings on cost, the environment, and jobs.

GSA, through its Public Buildings Service, is one of the largest and most diversified public real estate organizations in the world. We collaborate with other Federal agencies not only as our clients but also as partners in developing, implementing, and evaluating Federal green building programs through such initiatives as the ENERGY STAR program.

High performing green buildings provide the best value not only for the taxpayer but also to public through both life cycle cost benefits and positive effects on human health and performance. A recent study of GSA's earliest green Federal buildings shows energy use is down by over 25 percent and occupant satisfaction is up by the same amount as compared with commercial office benchmark data.

More importantly, the top third of those buildings we studied, which use an integrated design approach, deliver significantly better results with 45 percent less energy consumption, 53 percent lower maintenance costs, and 39 percent less water use. Other studies of private green buildings show that operating costs are 8 to 9 percent lower and building values are 7.5 percent higher. They have 3.5 percent less vacancy and yield a 6.6 total return on investment, an enviable thing in today's economy.

Further, their initial capital cost is not significantly higher. Studies in 2004 and confirmed again in 2007 document that green building aspects tend to have a lesser impact on cost than the many other myriad decisions that enter into building a new building.

But sustainable design is not just about cost. Good sustainable design offers value in environmental and societal benefits. For example, a planted or green roof not only saves costs by lowering the roof temperature and thus reducing the amount of cooling needed, it reduces the environmental impact by reducing power usage and the associated air pollution. The cooler roof temperature also combats the smog-forming heat island effect and even lowers the costs for neighboring buildings. Finally, planted roofs absorb stormwater, reducing water pollution caused by runoff. In cities like Washington, D.C., which has a combined stormwater and sewer system, this reduces water pollution both locally and downstream in the Chesapeake Bay.

The careful use of materials can reduce energy consumption during the manufacturing process and protect the health of occupants. Careful construction techniques can reduce the amount of construction waste that reaches landfills by 95 percent or more. Reuse of existing structures can reduce total resource consumption as well as preserve our Country's heritage. Careful siting can make buildings perform better both from environmental and human perspectives. Proximity to transportation, for example, reduces pollution and improves occupants' quality of life. The key to this is holistic, integrated consideration of all the factors that influence buildings, including perhaps the most important one which is the decision whether to build at all.

Much of the focus to date has been on sustainable design. Without design, we don't achieve the goals. For example, the Energy Policy Act of 2005 requires buildings to be designed to be 30 percent better than the current energy code. We need, however, to have at least as much emphasis on actual building performance. Beginning in 2010, GSA will require new building leases over 10,000 square feet to have an ENERGY STAR rating, which provides a valuable ongoing performance measure.

But as has been mentioned before, energy is not the only component of sustainability. The industry needs to expand its performance measures in other areas as well. Buildings exist in context. They are parts of neighborhoods, communities, and cities. They are also tools for businesses and organizations. One of the key policy changes of the Energy Independence and Security Act of 2007 was to clearly articulate that a high-performance green building must not just perform well mechanically but must perform to improve the health and enhance the performance of the occupants.

A key broad measure of environmental impact is greenhouse gas emissions. Measuring the collective effects of an organization's greenhouse gas emissions allows more informed decisions about every aspect that affects the buildings. We need to look at the way we buy materials for the building, travel to and from the building, use the building, and how the building is operating. When we look at both what the building is doing and what is happening inside the building, we can make even better improvements than looking at the building alone.

The Federal Government can, through its example, influence and accelerate the adoption of sustainable building practices and technologies across the Country. We can help do that through publicizing the quantitative results. The increased transparency of Recovery Act transactions and reporting on results are key to that influence. We are also working with the Department of Energy to establish broader benchmarking tools that will be open to the public and to businesses.

The jobs created across the design, engineering, manufacturing, construction, and operations industries will bolster the green economy. These jobs will provide practical experience in high-performance technologies, green construction, and building operations. GSA has identified over 50 different trades and professions that will participate in the accomplishment of GSA building projects.

Virtually all aspects of construction are changed in some way by sustainable practices and principles. This ranges from such basic

things as demolition work, where we mentioned the demolition recycling, the re-use and recapture of materials in the buildings, to avoid things going to the landfill and avoid the purchase in the first place, all the way to more high technology and obviously green economy components such as photovoltaic solar power systems, new lighting systems, which we are replacing in over 100 buildings, building controls, and advanced or smart meters. All of these require people with new training, new skills, and new contributions to the economy.

But it is not just in construction that new green jobs are created. Building operators in the Government and private sector are unable to find enough well trained people to run and maintain high-performance buildings. Buildings can easily slip into poorer performance without proper maintenance. The aggregate result is an unnecessary increase in energy consumption. GSA is already in conversation with the Building Owners and Managers Association, the International Facility Managers Association, and others about the shortage of sufficiently trained building operators. We believe that GSA's Recovery Act projects can provide jobs along this emerging career pathway that will persist to the future.

Thank you again for this unprecedented opportunity. All of us at GSA are excited by the contribution you have allowed us to make.

I am available to address any further questions you may have. Thank you.

Ms. NORTON. Thank you, Mr. Kampschroer.

Dr. Drury Crawley is a Lead Mechanical Engineer for the Office of Building Technologies at the U.S. Department of Energy. Dr. Crawley?

Mr. CRAWLEY. Thank you, Chairwoman Holmes Norton, Ranking Member Diaz-Balart, and Members of the Subcommittee. Thank you for the opportunity to appear before you today to discuss the U.S. Department of Energy's Building Technologies Program and the enormous potential for energy savings in the building sector.

At the Department, I lead the team working through the Commercial Building Initiative to achieve net zero energy commercial buildings. Our team has been working closely with Kevin Kampschroer and his team at GSA on these issues for a number of years.

As a resident of the District of Columbia, I am particularly pleased to be able to provide this information to Chair Holmes Norton.

In 2008, the Nation's 114 million households and more than 74 billion square feet of commercial floor space accounted for nearly 40 percent of U.S. primary energy consumption, 73 percent of electricity consumption, and 34 percent of direct natural gas consumption. This gave us energy bills totaling more than $418 billion and caused 39 percent of carbon dioxide, 18 percent of nitrogen oxide, and 55 percent of sulfur dioxide emissions in the U.S. Additionally, construction and renovation has accounted for 9 percent of the gross domestic product and has employed 8 million people last year.

The Department's Building Technologies Program develops technologies, techniques, and tools as well as minimum performance standards for making residential and commercial buildings more

energy efficient, productive, and affordable. The Program's goal is to enable net zero energy buildings at low incremental costs by 2020 for residential buildings and by 2025 for commercial buildings. Achieving these Program goals could potentially result in consumer savings of nearly $3.4 trillion by 2050.

We know that buildings impact the economy beyond the building footprint. In electricity use, for example, flipping on a light switch means fossil, nuclear, and renewable energy must meet that demand. Buildings also impact land use through supporting infrastructures such as roads, bridges, street lighting, wires, and pipes. For example, consider water usage. While building use does not directly impact water, the water used for cooling generation plants and electricity production is very large.

Thermoelectric power withdrawals accounted for 48 percent of total water use and 39 percent of total freshwater withdrawals for all categories in 2000. As a result of energy savings through our Program's efforts, we estimate we can avoid freshwater withdrawals of almost 2.5 trillion gallons per year by 2030.

The Commercial Building Initiative was authorized in the Energy Independence and Security Act of 2007 and was launched in August of 2008. That Commercial Building Initiative, or CBI, guides and coordinates our public and private partnerships, looking to advance the development and market adoption of net zero energy commercial buildings all towards a goal of net zero energy use by 2025. We are engaged with building industry leaders through energy alliances and research partners to move us towards that goal. This engagement includes commercial building energy alliances where we are working with commercial building owners and operators to significantly reduce energy consumption and carbon emissions. Currently we have alliances for retailers, commercial real estate, and hospitals in place with more under development. We have been working with commercial building national accounts, which are largely commercial building owners' portfolios of many similar buildings.

We have been working with our technical experts at the national laboratories to construct buildings that can achieve savings of 50 percent or more in new buildings or retrofit savings of at least 30 percent. We are also looking to select a building industry group, a consortium to help us disseminate the information on the new technologies and opportunities to the commercial building community.

The Department's Building Technologies Program is using up to $343 million in Recovery Act funds to expand and accelerate research and development activities, including advanced building systems research projects focusing on system integration and control of both new and existing buildings; residential building design and development; work expansion to increase home owner energy savings through retrofit and new home designs; the Commercial Building Initiative, where projects are accelerating; and partnerships expansion for exemplary energy performance with major companies that own, build, manage, or operate large portfolios of buildings.

The building and appliance market transformation work will also pursue a deeper penetration. The solid state lighting research and development area will be rapidly advancing energy efficient solid state lighting development and manufacturing.

In conclusion, I want to thank you for the opportunity to appear before you today. I am happy to answer any questions. Thank you.

Ms. NORTON. Thank you very much, Dr. Crawley.

Mr. Uhalde is a Senior Advisor at the United States Department of Labor.

Mr. UHALDE. Good afternoon, Chairwoman Norton, Ranking Member Diaz-Balart, and Members of the Subcommittee. Thank you for the opportunity to speak with you about green construction.

President Obama and Secretary Solis have made the creation and expansion of good green jobs a top priority, especially for economic revitalization and sustained economic growth. Green jobs can benefit the American worker by offering good wages, pathways to long term career advancement, and prosperity.

At the Department of Labor, we are working to support green jobs through investments in quality labor market information about green jobs, investments in training and reemployment services to support the job growth in green industries, and encouraging registered apprenticeship in green industries such as construction and building retrofitting.

The Recovery Act provided $500 million to prepare workers to pursue careers in energy efficiency and renewable energy industries. On June 24th, Secretary Solis announced five grant competitions for green jobs training. Four of the competitions are designed to serve workers in need of training through various national, State, and community entities and outlets. The fifth competition will fund State workforce agencies to collect, analyze, and disseminate labor market information about careers in green industries. The deadlines for each of these competitions are staggered throughout the fall.

The Department of Labor is working in other ways to promote green jobs. We are partnering with other Federal agencies to support the creation of jobs and to develop pipelines of skilled workers in the energy efficiency and renewable energy industries.

The Department's Employment and Training Administration plans to promote training in green industries, including green construction, through its regular programming programs such as YouthBuild, Women in Apprenticeship in Non-Traditional Occupations, and the Job Corps.

The Department of Labor is also prioritizing green jobs in our fiscal year 2010 budget request. We propose the creation of a $50 million Green Jobs Innovation Fund to help workers access and participate in green career pathways.

The Department's Bureau of Labor Statistics, in consultation with other Federal agencies, is working to define green jobs to capture the full range of labor market information in this rapidly evolving area. The Department funded a report by the Occupational Information Network, called ONET, to investigate the impact of the green economy on occupational requirements in current jobs and to identify new and emerging occupations. The study identified 17 occupations in the green construction sector such as welders and insulation workers where the demand for such workers would increase because of green investments but skills and tasks would remain largely the same. The study also identified another 19 occupations in green construction such as plumbers, roofers,

sheet metal workers that would result in significant change in their work and work requirements for these existing occupations.

The ETA is also recently added green building practices to the existing Residential Construction Competency Model to include home energy audits and waste management.

We are coordinating many of these efforts with our Federal partners to ensure dislocated workers, for example, are connected with jobs and that waste is minimized. For example, the Department is partnering with the Department of Housing and Urban Development on public housing retrofitting and with the Department of Education on training for weatherization work. The Department has begun initial talks with the General Services Administration to help in the greening of our Federal buildings by supporting apprenticeship and pre-apprenticeship programs in this effort.

The Department is looking at good, sustainable jobs. The Bureau of Labor Statistics data show that construction and extension operations and occupations pay a median hourly rate of $18.24 per hour compared with $15.50 for all occupations. The increased demand for green construction and retrofitting work, coupled with the demand for green building materials, is anticipated to speed the increase for manufacturing workers as well.

In conclusion, the Department will continue to work with the broad range of green building stakeholders to ensure that the benefits of green jobs are widely shared.

Thank you again, Madam Chairwoman and Subcommittee. I look forward to answering questions.

Ms. NORTON. Thank you very much, Mr. Uhalde.

Mr. Helsel is Treasurer of the National Association of Realtors. They actually have a leading green building here in the District of Columbia, which I hope he will reference in his remarks. Mr. Helsel?

Mr. HELSEL. Chairwoman Norton, Ranking Member Diaz-Balart, Chairman Oberstar, and all the other Members of the Subcommittee on Economic Development and Public Buildings of the Transportation and Infrastructure Committee, thank you for this opportunity to speak before you and testify on the multiple benefits of green buildings.

My name is Jim Helsel and I am the 2009 Treasurer of the National Association of Realtors. I have been a Realtor specializing in the commercial sector for more than 34 years. Currently, I am a partner with RSR Realtors, a full service real estate company in Harrisburg, Pennsylvania. I testify today on behalf of 1.2 million Realtors who are involved in all aspects of the real estate industry.

In 2002 and 2003, I served as chairman of NAR's Real Property Operations Committee. I oversaw the development and creation of NAR's Washington, D.C. headquarters, which also became the first privately owned; newly constructed LEED certified building and the first to earn the LEED silver designation in our Nation's capital.

NAR is uniquely qualified and honored to offer testimony on the importance of green buildings. In addition to certifying a green building, NAR has taken a number of other important steps to raise pubic awareness about the benefits of green buildings in the marketplace. For example, NAR has established a green designa-

tion program to offer advanced training and certification for real estate professionals. We have also advanced important green building issues including the greening of local multiple listing services. By including data fields in the MLS with information about real properties' green attributes, we are responding to consumer demand for more information about building efficiency. We have also partnered with the Federal agencies to promote green buildings. For example, NAR and the Department of Energy worked together on a joint Energy Savers brochure to provide consumers with the facts about reducing energy use and saving money.

We support the Subcommittee's efforts to lead by example with green investment in public buildings. These investments will help demonstrate new technologies and learning that result in lower cost options in the long run. NAR believes voluntary and incentive-based approaches such as tax credits will better spur consumer demand for energy efficiency. Moreover, there is also a need for information and education. We look forward to working with the Subcommittee to build on these approaches in the future.

NAR's headquarters was the first privately owned green certified building, as I mentioned earlier, in the District of Columbia. Located blocks from the U.S. Capitol, the building was first occupied in October 2004 and was awarded the Silver LEED rating by the U.S. Green Building Council. NAR believes the best way to promote change in our society is to lead by example. The NAR building is our effort to do just that.

As chairman of the NAR committee responsible for the development of the building, I knew we had a unique opportunity to demonstrate realtors' belief in green principles. For that reason, we set a goal to become LEED certified. While the building's LEED certification is a worthy goal in itself, it is the steps needed for certification that are creating a positive impact for the environment.

We began by cleaning up a Brownfields site with a long history of commercial use. An abandoned gas station previously occupied the site and we cleaned the site of contamination from leaking fuel tanks. The high-performance glass wrapped building wisely uses the daylight to significantly reduce energy uses. Now, 50 percent of the building's energy comes from renewable energy sources. The landscape of the building uses native and adaptive plant species to reduce irrigation demands.

Low flow faucets, lavatory motion sensors, and waterless urinals have all helped achieve a 30-percent reduction compared to buildings of similar size. The building is located near Metrorail stations and transit bus lines that have allowed us to achieve a high rate of transit use: 70 percent of our building occupants ride public transportation to work. In addition, showers have been installed to encourage biking to work.

All these accomplishments are highlighting the building as part of an education campaign of its sustainable features.

Just as NAR built a green structure to lead by example, so now NAR's policies support a voluntary, incentive-based approach to energy efficiency. We believe this will help build momentum in the private sector to adopt green trends. This provides a win-win by allowing for vigorous economic growth while improving the environment.

The role of the Federal Government to encourage green development should also lead by example. Through the development of green Federal buildings, the public sector can create best green practices that will transfer to the private sector.

During this time when the current real estate market is fragile and just beginning to show signs of recovery, additional onerous cost in the form of mandates could hamper our economic recovery and hurt the spread of green development. Realtors believe the Federal Government can do more to promote sustainable development by keeping the market free of mandates. We encourage the Federal Government to offer incentives such as tax credits.

Realtors have shown that building green can be both proactive and a profitable process. Our experience has shown that current programs have been allowed to thrive, shift, and mold to meet specific conservation needs in geographic areas. NAR supports a national green building program that is flexible and market driven that encourages continued growth and sustainable construction that protects options for consumers in all markets; and that preserves, protects, and promotes the health of our environment.

We stand ready to work with the Congress on the best way to implement green principles that balance needs in the marketplace with those of the environment. We look forward to working closely with your Subcommittee as legislation is considered.

Again, thank you for this opportunity.

Ms. NORTON. Thank you very much, Mr. Helsel.

What I am going to do is I am going to ask just one or two questions of each witness and then go to the next person. There may be votes. I may even have to go because the District appropriation is there. If necessary, we will come back. We will see how far we can get. There will be some time, though, I think before any votes come forward.

Mr. Kampschroer, as you can imagine, this office has been particularly interested in your new Office of High-Performance Green Buildings, so much so that we saw to it that it was in the first groundbreaking energy bill. You couldn't be coming online at a more auspicious time. Never in the history of the General Services Administration has it had so much money at one time to do good.

It has got 22 buildings here in the District alone. They are all across the United States, of course. I will begin here. They are in my Ranking Member's State. They are in every State of the union. They are in all four territories. I know they have been carefully chosen.

Now, we have heard your discussion of what your office does. Now we need to know, given the fact that you have this opportunity with so many resources, precisely what you are doing. What kinds of technologies are being required in the new construction, for example? What kinds of strategies are being used? We need to know if they are being used in all 22 buildings here and all across the United States. We understand it depends upon what is happening in the building.

We are trying to get an idea of some examples of the involvement—if there is involvement—of your office with the unprecedented repair, renovation, and construction now underway. Would you give us some of those examples? Let us know how your office

is involved, if it is directly involved, in the actual use of the stimulus funds the Congress has appropriated for the work of this Subcommittee.

Mr. KAMPSCHROER. Thank you. We are indeed directly and pretty intimately involved in the allocation of resources, the selection of projects, and the consideration of what goes into those projects.

I think one of the more interesting things that we have done since the passage of the American Recovery and Reinvestment Act is to create a series of standardized specifications for various technologies to be included in buildings. We have been working with the Department of Energy and several of the national laboratories under the Department of Energy to develop those.

Most particularly, I will highlight what we are doing with roofs. Every roof that was in serious need of replacement in the next two years we examined for four different possible technologies: integrated photovoltaic membranes, crystalline panels of photovoltaic energy production, cool roof technology generally, and planted roofs. All of them have standardized specifications that we have worked out with the Department of Energy as well as with our legal council. These are being used in every contract across the Country, both here in the District as well as all across the Country.

In lighting, we have worked with the Department of Energy, the Pacific Northwest National Laboratory, and the National Electrical Manufacturers Association to develop a series of seven different technical specifications for different lighting systems. What we are trying to get across is the idea that lighting technology in the last 10 years has changed dramatically. The typical approach that you hear about from sort of Joe's Garage Manufacturer and Lightbulb Replacement Company is that all you do is you go in and you replace the lamp. You take out a 32 watt lamp and put in a 28 watt lamp and you save something.

But what has happened is that in many of our office buildings you have lighting conditions that were designed on standards that were developed before the personal computer was even invented. We need to completely rethink the way lighting is done in the buildings.

We need to split the systems, have just a little bit of light in the ceilings, and recognize that actually what has happened in our buildings is that we have too much light. Office buildings in this Country have 400 times more electric light today than they did in 1900. Our eyes haven't gotten 400 times worse. We need to really harvest the daylight that is there.

I remember vividly the Chairwoman coming into one hearing, dramatically opening the windows behind the chair, and saying we could really use a little bit more of the light. Of course, we were then seeing the CNN camera crew at the other end wince as their cameras no longer could focus on the Members. But that is very, very possible in today's environment.

What we are finding is that even today, compared to the retrofits we did in the 1990s, we can reduce consumption of energy by half from those even good standards back then. We can also improve the working environment for the people there, reducing the amount of glare on the screens, recognizing that most of us spend most of

the day working on devices that produce their own light so we don't need to add nearly so much.

Then we need to be working carefully with the Chief Information Officers of those organizations to make sure that they are using the appropriate technologies to reduce the energy consumption in the management of the devices on people's desks. So those are a few of the examples of the combination of technology.

The other thing I did want to mention is that we are systematically instituting a long term measurement process. We are working, for example, with every photovoltaic installation that we have to populate the Department's of Energy database that measures long term production and reliability of photovoltaics. That way, we know what technology works and what technology works a little bit better as we go forward. We will be using several different technologies so this is particularly important for them.

At the same time, we start every project by going back and looking with a highly qualified engineering team, again, one of our standard technical specifications, at every piece of equipment in the building that could and should be commissioned. Again, we are following the rules that are laid out in the Energy Independence and Security Act for re-and retro-commissioning, using that as the basis for going forward and not only designing changes to the building's systems but also measuring as we go forward. We want to make sure that those savings are achieved.

Ms. NORTON. It looks like you are involved, Mr. Kampschroer. That is what we want to be sure of. These are important to note.

Mr. Crawley, you have heard some of what Mr. Kampschroer is doing. I was interested in your testimony discussion of research, especially as I heard Mr. Kampschroer's testimony. Here we have two offices—the GSA certainly needed its own office given its own inventory and its own needs—but I am interested in the relationship of these offices to research.

Let me indicate what my bias is. I am and always have been a strong supporter of the work we are doing here. But I have my doubts about the impact we are going to have even if we got everyone in the Country to do what they are supposed to do. The instinct of the national population is to believe in inevitable progress and that you are not supposed to make sacrifices. Therefore, in my own thinking about greening and climate change, I am far more interested in technology.

I drive a hybrid car. I don't know how D.C. is so long in getting a plug-in car. Even that, it seems like we should be beyond batteries by this time. We have only begun to fight, as they say. But at least that is an example of where people could switch immediately based simply on a technological change. That has been within our grasp for a very long time and we just have only begun to use it, certainly to any significant degree, in this Country.

So I think we have got to press people as hard as we can to do all the things we are doing. I was raised to turn off lights and the rest of it. But to have a kind of cosmic impact that we better begin to have if we are serious about climate change, we have got to have a view of how bad it is, how it shot up so quickly, and then what is really available to us.

Now, Mr. Kampschroer is looking at advanced lighting and heating and the rest. On page two, you list areas of research of the very same kind with ventilation and air conditioning. With the kind of limitation on funds that we have and the deficit that we have, I would be particularly interested in how much actual sharing, particularly in the research area, can be done. The last thing we need to do is have one office duplicating the other, especially when it comes to frontier research of the kind it is going to take to have any difference, if at all, in the short term on climate change. I would like that difference to come while there is still an Earth, a planet here.

So could I ask you about how you know whether or not Mr. Kampschroer, who works, for example, in the commercial office area that hugely overlaps with yours, whether you know even what he is doing? How do you envision working with him so that you and Mr. Kampschroer aren't spending Federal dollars doing the same work on ventilation or heating, particularly given the advanced science, advanced techniques, and frankly the advanced and costly personnel it takes to make any kind of breakthroughs? How do you avoid duplication?

Mr. CRAWLEY. I think we are already avoiding duplication. Mr. Kampschroer and my office have been coordinating for several years, even before the Energy Independence and Security Act asked us specifically to coordinate and to work together. Particularly with the Recovery Act funding, we have been supporting his work. Specifically, the expertise of our labs and our other consultants provide technical support.

He mentioned lighting. We were able to produce specifications for the office sector, taking the knowledge we already had from our research, giving it to them directly, and understanding their needs.

GSA has also been very supportive in the work that we have been doing. They are, as we have already heard, a leader in this area. They have helped us in establishing our energy alliances. In the commercial sector, Kevin and his team have been very supportive in helping us establish best practices since they know what works well and what information we can get out into the private sector. Also, those alliances are a way for us to learn what research needs to be done. Are there technologies in the market today that can meet those needs? If not, then our research will support GSA and our other Federal agency partners that we are working with today.

Ms. NORTON. I very much appreciate that. The funds will be scarce. Did you want to say something, Mr. Kampschroer, on that?

Mr. KAMPSCHROER. If possible. One of the other things I did want to mention is that when the national laboratories and the Department of Energy are looking for locations in which to do research in actual operating buildings, GSA typically will work with them to supply those buildings. Thus, we make the use of actual operating buildings.

We just actually completed with Lawrence Berkeley National Laboratory a study on different kinds of filter materials for cooling systems in a building that we operate in Cottage Way. So they do the research and we provide the place in which to do the research.

Ms. NORTON. So you are the laboratory?

Mr. KAMPSCHROER. Yes. The guinea pigs, you might say.

Ms. NORTON. I like that. Indeed, it seems to me the GSA ought to have to do virtually no research. You have at your disposal all of the Energy labs and the advanced science, perhaps more so than any civilian agency. For that matter, I would hope that the Defense Department, which has more money rolling around than anybody, would be useful to us all.

I want to ask Mr. Uhalde about these green jobs because I am real mixed up about green jobs. I want to make sure this doesn't become a racket.

I remember when we had our first big Stimulus hearing asking the unions and the manufacturers about—particularly, was I interested in the workforce—how interchangeable the workforce was and the rest. I certainly recognize that at a certain level there would be a certain kind of training. I must say that they assured us that the workforce was interchangeable. I am sure that you have journeymen and the rest who are already doing this work.

It occurs to me that much of the work does not or should not, in fact, take a lot of training. When we use the term "green jobs," it sounds very mysterious because it covers a multitude of either sins or skills that are not spelled out. So I am interested in the levels of jobs that we are calling green jobs. They would go all the way up the scale, all the way up to the electrician and the engineer.

Would you start at the lowest level and make me understand the skill level that is necessary and whether it is so terribly much to do? What kind of training would it take? Help me understand what I mean—which I do not know—by lowest level. Then, to the best of your ability, go on from there to where you think you hit a threshold where considerable training is necessary. Then what are you talking about? Is it on the job training, school training, and the rest? Thank you.

Mr. UHALDE. Thank you, Madam Chairwoman. The study that I cited in my testimony, the Occupational Information Network, did identify many occupations that we currently know and are very familiar with. They, in some sense, have what has been referred to as a green patina. There are aspects of the occupation and knowledge that are changing because of energy efficiency and renewable energy emphases.

For example, you could have workers who worked in the auto industry in stamping plants who now can be working in the wind turbine manufacturing sector. They are continuing to work in a stamping plant are but stamping out metals for wind turbines. Similarly, being able to assemble wind turbines on the ground, maybe wind turbine assemblers are assemblers that might have been working in another field. It is the nature of the product that makes it a green job as opposed to the actual skills.

But we are also learning, like in construction, that there are just certain competencies that need to be paid attention to that weren't before. We need much more attention to waste management and disposal as well as the identification and treatment of renewable waste products.

Ms. NORTON. But isn't that a management as opposed to a worker issue?

Mr. UHALDE. But then the worker has to be given the knowledge and has to be able to be sensitive to the fact that they have to pay attention to these.

Ms. NORTON. But you don't have to be a rocket scientist.

Mr. UHALDE. We are not talking many, many years or even months in many cases. For example, we are interested in career advancement, so maybe weatherization tasks, that is the energy auditing that is required and then the remediation and installation of weatherization products, and weatherizing residential neighborhoods might be considered at the entry level of a career latter in this. We have recently spoken with community action programs who are doing a lot of the weatherization work. The training and certification can be a matter of three or four weeks for energy auditors in that work area.

Ms. NORTON. Is there anybody that certifies any of these people who are all going to now say they can do green job training?

Mr. UHALDE. Well, what they certify in this case is weatherization, both energy auditors and into the area of remediation and installation of weatherization.

Ms. NORTON. It is important what you said about how you are usually referring to the job as opposed to some set of skills. I recognize that when we get into some of the areas we have been discussing, obviously, you are talking about some specialties, people already have the skills but need to get a little more knowledge and information. I just want to make sure that everyone understands that a lot of this work, and I think the majority of this work, is not very advanced.

Mr. UHALDE. That is correct. Some of it is not and it is as I said, putting a green patina on existing occupations. But others like environmental technicians and stuff are very much growing occupations. There are two year community college programs and certificates. They are very important as augmentations to engineers and water quality technicians and so forth.

Ms. NORTON. We want to encourage people to pursue those growth occupations. We, of course, are particularly interested in the Stimulus funding for jobs that can be done now. That is the reason for my question. You don't have to go to school to get many of these jobs or you go to school for a short time and it is worth that training.

Mr. Helsel, when your building was going up, I thought it was sent from heaven. I can tell you as a native Washingtonian, that strip of land, if anything, was seen as a throw-away strip. There was a little park on one end but it was so oddly shaped that no one would have thought, frankly, that what would ever replace it would be a building. Its shape did not invite a building. But you have changed the entire environment by placing a building there.

I would be particularly interested in why you chose this space. Since the building has been up, I remember I went to the opening of the building, almost ten years ago, is it?

Mr. HELSEL. It was 2004, ma'am.

Ms. NORTON. You may be able to talk to us about savings you have already seen and when they began to kick in. I understand, for example, there has been some water reduction but there may

be others. If you could, speak about this first green building in the Nation's capital.

Mr. HELSEL. Thank you, Madam Chairwoman. First, I would say that when we set out to find a new home for the National Association of Realtors, we did so with a number of criteria. One was that we wanted to be fairly close to the Capitol. We wanted the legislature to see that we were serious about doing what we wanted to do, which was to be in the Nation's capital. That occurred when people were still not sure how much they wanted to build after 9/11, frankly. We started this process right after 9/11. When the building went into service in 2004, it was significantly after that. It was after a lot of work.

We also wanted to go to an area where we thought we could help the neighborhood. As you have said better than I could, that neighborhood needed some work done in it. I think it was with a little bit of help from people like you in the District, from the District of Columbia itself, and from the Realtors that we saw the advantage of taking a site that maybe some people did not want to touch by virtue of some things like Brownfields.

We thought we could not only help the environment and the neighborhood geographically, but we could do something that the Realtors could be proud of as well. We could say look what we have done for our Country as it relates to environmental issues and things like that. So there were a number of things that went into that.

I will be honest with you: When we started the process, we didn't start the process thinking we would go with a LEED certified building. It was shortly after we got on site, purchased the land, and began to do work that we decided that was the right thing to do. We made the decision at that point.

To your question that relates to savings, I think I said in my testimony that we save somewhere in the neighborhood of about 30 to 31 percent in water savings a year. We gather water off the roof and off the flat surfaces of the property, which we keep in underground tanks. We use that for rewatering of plants and things like that both on the rooftop terraces as well as on the surface of the land around the building. We also do things like waterless urinals. We have flow restrictors on a lot of things. We have done a lot of things like that from a water standpoint that have been very beneficial. It is about 30 or 31 percent.

We also did some things with electric that were interesting. There was a lot of discussion a little bit earlier about lighting with buildings. We actually have taken our building and, as some of you know, the building is enveloped in glass. We have taken not just the natural ambient light from the outside but we have also decided that we can't just have ambient light. We need to be able to adjust lighting based on what people need in their workstation areas. That building is set up more in workstations than it is in private offices, though there are both. So we use light sensors in the building.

You will find that the lights in those buildings rise or fall in terms of brightness based on the ambient light that comes in from the outside, which has been a great savings from an electrical standpoint. You don't see the difference; you don't notice the dif-

ference when you are sitting in your cubicle. But it occurs on a daily basis, whether it is cloudy, whether it is light, whether you are on the east or west side of the building. We have done some things like that that have been helpful as well.

I would say, if you said to me what is the overall savings we gain on an annual basis, probably somewhere between 12 and 15 percent over the operational costs of what it would have been had we not gone LEED certified. It varies a little bit depending upon the year, depending upon what happens with weather inside and outside. No matter how well we have enveloped the interior of the building, the exterior weather certainly affects what happens. So from a practical standpoint, I am comfortable saying 12 to 15 percent on an annualized basis. That figures in as well the 30 percent on water so it is kind of a blended rate, if you will.

Ms. NORTON. So these systems are paying for themselves?

Mr. HELSEL. They are. Our estimates were when we built the buildings that most of the systems would repay themselves in either three to five years or five to seven years. That is not totally true of everything but it is a good average for what we did.

Ms. NORTON. That payback is so demonstrative; it is so compelling that I don't see how you could build an office building without it today. Of course, you didn't know in 2004 what we know today.

Mr. Kampschroer, I heard you testify as well as Mr. Crawley, but let me ask Mr. Kampschroer about what we are doing. Then I am going to go straight to Mr. Diaz-Balart.

You talked about over-lighting. Now, you have got this magic opportunity with the DHS building. I hadn't even heard of this in an office building where there are kind of self-adjustments based on the lighting.

We just got in the Capitol a system where, if you step into a hallway, they can feel you or see you and then the lighting comes up a little bit. That is where we are. I don't think anywhere in the Capitol is the light adjusted based on the kind of outside lights you have and the rest of it.

So I am going to ask you, when you are doing lighting, have you any knowledge of this system installed in 2004 when you are doing the 22 buildings here and the buildings across the United States with the over-lighting? Are you using these light sensors, for example, that were just described by Mr. Helsel, who was one of the first LEED buildings?

Mr. KAMPSCHROER. Yes, we are. In fact, it is part of our standard specifications that we use variable ballasts. For every light fixture or light luminaire in the ceiling that is within 15 feet of the exterior window, they have an adjustable ballast that performs exactly was just described.

Ms. NORTON. On their own, self-adjusting?

Mr. KAMPSCHROER. Self-adjusting. Furthermore, we even have one installation that we are using as part of our standard specifications when we can where the lighting is tied to individual occupancy. You just described walking into a room and the room lights go on. What we are talking about here is the individual desk being tied into the control system so that if I am not sitting at my desk, the lights automatically go off no matter what is going on, person by person. Then furthermore, we allow the individual person to

override what the controls say. If they happen to be doing work where they need more light, they can turn it on. Or, as frequently happens in my office, I override the controls and they go off.

Ms. NORTON. Excellent. I just wanted to make sure we were at least current with 2004 and Mr. Helsel.

Mr. Diaz-Balart?

Mr. DIAZ-BALART. Thank you, Madam Chairwoman. I think this has been fascinating. It is just amazing cutting edge technology, which obviously is very exciting.

By the way, Congresswoman Fallin did, I think, submit some questions to the Chairwoman. If you all could have a chance to look at those and make sure that she gets a response, we would greatly appreciate that. Thank you. We just have to take care of that house cleaning part first.

I am going to go back to, frankly, a very basic issue. I keep harping on this but it is pretty evident why I keep harping on it. I don't have to tell you all where we are in the economy.

This Congress and the Administration charged another $780 billion on our children and our grandchildren because it is money that we don't have. With interest rates, it is over $1 trillion to create jobs. That was the explicit reason for that bill. That was, remember, on top of $1 trillion for TARP. That was on top of half a trillion dollars for the Omnibus. That was on top of the billions and billions to keep the auto industry from going into bankruptcy, which didn't work because they went into bankruptcy anyway.

We know that despite all of that, unemployment is now at 9.5 percent, not at the 8 percent we were told it would be capped at. Millions of Americans are working part time jobs or less hours because there are no full time jobs available. So I am not apologetic about going back to this one issue, which is jobs.

Now, I have two questions on that. I heard both in written testimony and in the testimony today that the Bureau of Labor Statistics is now working to define green jobs. So here is a question that kind of jumps out at you: How are Labor, GSA, and other agencies even measuring the number of jobs created by this funding if we don't even have a measurement of what those are and how to define them? How was Labor able to determine the type of training needed for these green jobs when we don't even have a definition of what those green jobs are yet?

Mr. UHALDE. Mr. Diaz-Balart, when I said the Department's of Labor Bureau of Labor Statistics is working to define green jobs, they have requested in their 2010 appropriation funds to be able to systematically identify and count over time on a quarterly basis green jobs, both the industries and then occupations, and the number of people working in those occupations. This will be over time, across the Country. We want to be able to identify by geography where these are and what the concentrations and distribution of those jobs are.

But in terms of doing, for example, the job training that we have put out, we have a working definition of green jobs that we are using and that people are using. We had a discussion just a moment ago and you heard about certain craft and trade occupations that are developing green aspects to them, but also that there are applications of current jobs in new industries. For example, if we

are hooking up smart grid systems around the Country in west Texas, the Dakotas, and elsewhere, the line installations and stuff are contributing to more inexpensive and efficient energy production by hooking to wind turbines and the like. But much of the work that is being done is by line installers and repairers that have existed before.

So what we will do over time is to decide whether and how to define these as green jobs or not and how many to count. But in practice, what the Recovery Act has done is incentivize more of that activity. For now, we need more workers to train in those areas.

Mr. DIAZ-BALART. Let me ask you, do we have any idea of how many jobs, just jobs, green and otherwise, have been created with the funds from the Recovery Act in your areas and how many are projected? This is something that the Chairwoman has always been very emphatic about, making sure that we can track those.

Mr. UHALDE. Well, we don't have the estimates of green jobs. But the Administration, early on for the Recovery Act, estimated that 3.5 million would be created or retained by the last quarter of 2010.

Mr. DIAZ-BALART. I understand that. They also said that unemployment would be capped at 8 percent. We are way beyond that. We have lost 2 million jobs since the bill passed and unemployment is now way above the 8 percent.

But that is not my question. My question is do we know how many jobs in your areas with the Stimulus money have actually been created?

Mr. UHALDE. We are going to count and report. We just got our first report from our Department of Labor expenditures. The first report, I think, for almost all of Government is July 15th. So all the States have reported as of yesterday their first expenditures on that. We will start doing that on a monthly basis starting this month.

Mr. DIAZ-BALART. Great. Thank you. Thank you so much. Thank you, Madam Chair.

Ms. NORTON. Thank you very much. The Ranking Member is right. He mentioned a favorite of mine, which is jobs. It is also a favorite of the Administration. It is the whole point of the Stimulus funds. The second priority, of course, was energy conservation.

Going to jobs, let me tell you, Mr. Kampschroer, I had a discussion with a high official a couple of weeks ago at GSA after I had labored to get specific funds, albeit only $3 million, placed into the stimulus package for pre-apprentice and apprenticeship programs. There was no action, even though some of this work isn't begun, that he was able to tell me had been taken. I began to rattle off common sense things to do without knowing what to do.

Meanwhile, at the last big hearing that the Chairman had here on Stimulus jobs, I asked the Department of Transportation, which has a comparable labor force, what it was doing. I asked them if necessary to work with GSA. The Federal Highway Administration now has more money—$20 million, that is not a lot either—but it has got a two-pronged approach going. It has solicited proposals. Its Office of Civil Rights has jurisdiction.

Let us be clear why. This industry, the construction industry, was once and is no longer, I am pleased to say, the most segregated industry in the United States. It was not because they set out to be that way, but because they had a father/son/nephew way of doing jobs. People who weren't nephews or sons, mainly women and people of color, simply were not in the industry at all. The courts took action. The Federal Government, along with the industry and Labor, set up a very good labor management Government enterprise. It was abolished in 1980 after it got a generation of no appreciable systematic addition of minorities and women to this workforce.

Meanwhile, the workforce is aging out. Before the collapse of the economy, there were actual shortages of journeymen, for example, in most of the trades. So I was heartbroken to hear that the GSA had been so slow. They know my priority on this issue. They also know I worked very hard to get them the biggest project in the Stimulus package.

So I have got to ask you, where is GSA on its decision about how to incorporate the funds that were specifically appropriated to the GSA for pre-apprentice and apprenticeship training of people who have not had access to such training in the Country?

Mr. KAMPSCHROER. Thank you. First of all, our memorandum of understanding between ourselves and the Department of Labor has been completely executed at the beginning of this month.

Ms. NORTON. You're what? I am sorry.

Mr. KAMPSCHROER. We have a memorandum of understanding between ourselves and the Department of Labor which identifies who is doing what within our programs to identify both apprenticeship and pre-apprenticeship programs, to make sure people are properly certified to do them, and how best to apply the funds across the Country. We are currently identifying projects and locations on the spending plan that we submitted earlier.

Where registered apprenticeship programs already exist, we expect a complete report on that by the end of next week. For every project that we identify on the list, the construction contractors will be required to maintain the apprenticeship program throughout the duration of the construction of those buildings. We have already developed contract language and provisions to encertain those contracts modeled on those that have already been successful in the national capital region of GSA.

We are meeting with the Department of Transportation on the 31st of July to find ways of optimizing our resources and contract vehicles to more effectively implement apprenticeship programs in GSA and to see if we can't have some kind of cross-fertilization between the two agencies.

We have hired a consultant to help identify State and community based organizations that currently offer pre-apprenticeship programs including on the job training, classroom training, and work/life training that assist us in developing new pre-apprenticeship programs in areas that are deemed most needy across the Country and are located where we have Recovery Act funded projects. We expect the initial report on how we are going to design that by, again, the end of next week.

That is sort of the nutshell version of where we are today. We would be happy to provide further detail if you desire.

Ms. NORTON. The Chair expresses her profound disappointment in what I have just heard. If you had a lot of money, I could understand the bureaucratic approach you have taken of first let us consult with the Department of Labor. The Department of Labor knows a lot and it has a lot of money to do what it is going to do. You got three million lousy dollars.

The notion of treating that $3 million as if there needs to be some Government-wide consultation as opposed to forming a taskforce of some kind to consider, because you know exactly why these funds were put in and you know the embarrassment to the Country when people go out on these jobs and see that there are not people trained to do the jobs, it makes sense for you to have consulted with Labor, but I don't see how that could have kept the GSA from looking at its own, given the small amount of money and the need to spend it with the summer coming up. That is the prime building season and you have now wasted half of it while you consult.

Let me tell you, I don't know why the Department of Transportation has been able to get up and running so much more quickly, but it may be because the Civil Rights people were in charge. They understood why this money is in there in the first place. There are millions of Americans who aren't trained to do this work, even at the lowest levels. Pre-apprenticeship is necessary in order to get them even a foothold in the apprenticeship.

The national capital region program is irrelevant. It is a certified apprentice program. I am grateful for it. But it is a program merely to make sure that if you are an apprentice on a Federal job here, you are a certified apprentice. It keeps jackleg apprentice programs from occurring in the national capital region. It has absolutely nothing to do with the $3 million, which are training funds. Even looking at that program shows me that the Agency has not paid attention to the purpose of the funds.

It is very, very disappointing to me. It was not easy to get these funds. I am not going to go on longer except to say that I already spoke with a high level official. With so few funds, all this consultation is make-work. If he identified the Agency's goals and then went to the Department of Labor and said these are the kinds of places we are thinking about going and we are thinking about going there because there is a critical mass—why would you want to do it in the first place if you are only doing a tiny bit of Federal work—but there is a critical mass of work to be done here and we don't want to duplicate what Mr. Uhalde has much more money to do, just as you are coordinating with Mr. Crawley, at that point, when you understood what you were doing and the options available to you, it make all the sense in the world to make sure you weren't duplicating what you were doing.

This has to be done by, yes, consultants. But this is a pittance of money.

Let me tell you how disappointed I am and what I am going to do about it: I would like the appropriate officials to meet personally with me, Committee staff, and my staff in my office no later than next week. Next week, I won't set the date. I have no idea what

is the best date even for me. But whatever date that is, that is the best date for GSA to come in. There has got to be something on the ground.

We are talking about on the job training. Most of the money should go into pre-apprenticeship programs. That program has to do a lot with making sure that you clear the decks of people who don't even understand that an apprentice program, to be successful in it, you have got to be able to get up and be to work at 7:00 in the morning. You have to work in the heat of the day and you have got to be able to go to work when it is very cold. A lot of it has to do with training an entirely new workforce of people who have not been exposed.

To the extent that we are sitting around trying to see how many boxes to check off before we begin to spend what amounts to two cents, that is all we got, and we are now into the middle of July and we are not even started in one place even though this area right here is rich with opportunities? Yes, they have got to be spread all over. Staff told me there was even some consideration of taking this $3 million and daubing in here, there, and around the Country. If you only have $3 million, you have got to look at where it can be most beneficially spent given the Congressional intent and the amount of money. So to act like you can do 50 States, the District of Columbia, and the four territories with $3 million is so pitiful that I am angry, frankly.

You ought to know I would be angry. I have called you personally. So I want the meeting in my office. I want your preliminary thinking. Talk with the Department of Transportation. Find out how they were able to do it so quickly. Don't come in as a blank check about which Federal office you are now talking about. Come in with some ideas of your own. We will work with you. There has got to be a program of some kind.

Let me be clear: What is today? What is the date of today?

Mr. KAMPSCHROER. The 16th of July.

Ms. NORTON. Guess what? August the 1st, there has got to be some apprenticeship work being done with that $3 million. So get yourself geared up.

This was February. You knew there was going to be a pre-apprenticeship program before February, before the bill was even passed.

The Ranking Member has talked about where the jobs are. Well, that is a fair question but it takes time for the jobs to roll out. There is a lot of pressure to get the jobs out. But it doesn't take a lot of time to put a training program in place that does not require anything but the preparation for people for on the job training.

I am profoundly disappointed and will not stand it another moment, not another moment. Be in my office next week and on the ground somewhere by August the 1st.

Mr. Carnahan?

Mr. CARNAHAN. Thank you, Madam Chairwoman. I am pleased to be here and to see the work that this Committee is doing with regard to green buildings. I wanted to, again, thank the members of the different Departments and the representative from the realtors for being here.

I wanted to start off with a question for Mr. Kampschroer. Unfortunately, some high-performance building systems can cease working as they have been designed over time, largely because they don't receive proper building management operations or maintenance. You have touched on this point during your testimony. We have talked about this before.

Do you have any estimate on what percentage of facility managers within GSA are properly certified?

Mr. KAMPSCHROER. I don't have a good percentage because there isn't a standardized, nationwide certification program that really deals with this technology. One of the things that GSA has done in this area is that we have worked with Penn State University to develop a program for GSA employees. In the last couple of years we have trained nearly 700 people in various aspects of high performing buildings.

But we do recognize that this is an industry-wide phenomenon. I mentioned in my statement the Building Owners and Managers Association and the International Facility Managers Association. There are also private firms like the Hines Development Company who have internal training programs. They have indicated their willingness to work with us on some kind of more significant certification program.

But I think that this is an area that the industry as a whole is lacking in. It is one of the reasons that, for example, in the Energy Independence and Security Act there is a requirement to recommission buildings every four years. We found that in four years, as you mentioned, buildings get out of tune as it were. One of the things that we are doing to ensure that doesn't happen with this unprecedented opportunity is to make sure that as we put in the smart meters we have constant monitoring systems going on. So, at the very minimum, we can find out with early warning systems when things are going out of tune and apply some greater expertise in there.

But I think it is an area where we could incorporate community colleges. We could really look at a longer term program that would yield not just green jobs but also a career path that doesn't exist today. There are all kinds of levels of work in buildings, from changing filters, which requires, as the Chairwoman says, very little training, to actually retuning and making sure that the control systems in buildings are tuned. That, in many cases, requires significant programming and engineering experience to understand what you are doing and to make sure that it continues to work.

Mr. CARNAHAN. So, if I understand this correctly, the 700 you mentioned are facility managers that have had at least some level of training that the GSA has sponsored internally.

Mr. KAMPSCHROER. Yes.

Mr. CARNAHAN. How many facility managers are there nationwide? I am trying to get an idea of how many people have been through this kind of training.

Mr. KAMPSCHROER. That is the significant majority of the people who are GSA employees. But we should recognize that about 96 percent of this work is actually done through contract.

We are at the moment changing our contract specifications to increase the requirements for training and certification of training.

But that hasn't gone into place yet. That is a thing that we need to be doing more of. We have recognized that and we are tying, again, to work with the institutions to figure out what the best requirements are that are both available and achievable but also effective.

Mr. CARNAHAN. Tell me what kind of time line the Agency is on to get those kind of mechanisms in place.

Mr. KAMPSCHROER. If I could, I would get back to you with that when I have the accurate information. I don't have that with me.

Mr. CARNAHAN. If you could provide that to me and the Committee, that would be very useful. I appreciate your acknowledgment of this in terms of the operational expertise and training for buildings as we are improving their performance.

The next question I had was for Mr. Crawley. You mentioned the High-Performance Green Building Consortium under the Commercial Buildings Initiative at DOE as a DOE/private sector effort to advance technologies. But I understand that DOE has yet to recognize the participating groups. Can you give us an update on the status of those partnership programs?

Mr. CRAWLEY. Yes. There was a solicitation from the Department out six or eight weeks ago. That closed on Tuesday of this week. We will be looking to make a selection in the next few weeks.

Mr. CARNAHAN. What would be the process beyond that point?

Mr. CRAWLEY. At that point, the consortium that is selected through the competitive solicitation is actually contractually working with the Department. We will be working with them to set a program of work over the next few months and the contract is put in place. Recognized corsortia will also be put on our website.

Mr. CARNAHAN. Thank you. I will look forward to seeing that up and going.

Back to Mr. Kampschroer, I would like you to share with us what has been your experience with using energy saving performance contracts and how we can increase their use within the Government sector. We have heard some success stories about those being used here and overseas in terms of Government entities being able to basically at no up front cost be able to have these companies come in and retrofit buildings. Part of the cost savings from the energy use is passed on to the Government entity and part goes to the companies that are doing the work. I want to see what kind of opportunities there are to use this mechanism to begin to retrofit our buildings.

Mr. KAMPSCHROER. Thank you. Energy savings performance contracts and their twin with utilities, the utility energy savings contracts, have been used in GSA for more than a decade. We currently have 52 active energy savings performance contracts and utility energy savings contracts across the Country with a total investment amount of over $200 million and an annual BTU savings of one million million BTUs through the use of energy savings performance contracts.

The Department of Energy has recently established a new contract with a greater number of firms, 16 firms, under the Super ESPC contract. Those are for large jobs. GSA, though its schedules program, is establishing some of the energy performance features

into the schedules that we already have for energy contracts that will deal with the smaller jobs that other agencies may have.

We are currently negotiating energy savings performance contracts that are in conjunction with Recovery Act spending where we have decided where the best use of the Federal dollars is. Then firms are being solicited to do additional work with private financing so that we get the best total energy conservation in the building.

The key to all of this is solid negotiation with good technical backup. We use technical backup from the Department of Energy as well as some that is privately contracted directly with GSA to ensure that we have got the best engineering reports on hand. For Recovery Act projects, as I mentioned before, we are doing an independent commissioning of the building first, which gives us even better baseline information before we even go into negotiations with the energy services companies.

We have also dealt directly with the Association of Energy Service Companies to try and encourage them to propose not just the short and easy low hanging fruit, or as Secretary Chu says the fruit on the ground, but rather to really give us the proposals that stretch the limits of capabilities that are available in the technology but that also will give us the most durable benefits over time.

Mr. CARNAHAN. Is this being done, in terms of vetting these firms and getting them involved, is that being done centrally here or is that being done throughout the various GSA regions in the Country?

Mr. KAMPSCHROER. The individual contracts are negotiated in the various regions around the Country. However, the contracts are reviewed in the national office before award for two overriding reasons. First of all, we want to make sure that the engineering is adequate and we have gotten the best possible deal for the Government. Number two, we want to make sure that the asset value is actually being increased by the performance of these contracts and that we have the appropriate measurement criteria as we go forward.

I have one other point. The pre-qualification of all of the firms was done nationally by the Department of Energy in the ESPC program. So every firm we deal with is already pre-qualified and has a negotiated contract. So we are in essence issuing task orders under a master contract.

Mr. CARNAHAN. Thank you.

The next question is really to all the participants. It is related to what I believe is a fundamental problem with how we manage the construction and maintenance of our Federal building stock. As you all know, we have a Congressionally approved budget for acquisition and a totally separate budget for yearly operations. Often the responsibilities of these budgets are in two separate organizational elements with different leadership and reporting responsibilities.

This means that any investment in innovation that increases our acquisition cost, while substantially reducing the long term cost of operations, is not considered. This is a fundamental dichotomy. I

believe it creates a misalignment between setting goals for high-performance buildings and achieving these goals.

There is no short answer for this but I would like to ask each of you to comment on this dichotomy and whether you have any thoughts on how this can be better coordinated. We will start with Mr. Kampschroer. We will go from you and then to your left.

Mr. KAMPSCHROER. This really is a no short answer question. I wish I knew the answer to it because then I would be advocating it right here and now. I suspect it is going to require a combination of the Executive Branch and the Legislative Branch working together to figure out a different way to handle the dichotomy that you point out.

One of the things that has happened that I think improves the situation, and it actually came from this Committee into the Energy Independence and Security Act, was the lengthening of the time over which we can make life cycle cost analyses from 25 to 40 years. That enables us to make better sets of decisions, especially for those pieces of technology that have a longer life span as well as for those components of buildings like the envelope, windows, roof, and so on that last longer but increase capital. As Ms. Fallin mentioned, geothermal ground source heat pump systems, which have a significantly higher capital cost, certainly pay off in lowered operating costs and lower energy consumption over time.

I am not exactly sure, in a nutshell, what the right answer is. But it is some way of linking the two budget activities.

I think another key is changing the measurement systems for the people who are in charge of projects. If today we measure only the budget and the schedule of the capital, you are inherently not going to measure the long term effects of the building. We have to have that feedback loop of the long term effects to make sure that in fact decisions that are made during the course of the project are those that will yield the greatest overall benefit and not the greatest short term or initial cost benefit.

One of the things that we have proposed to bridge that gap in GSA's budget this year was a line item in the budget that would allow us to apply it without regard to the original budget cost to, say, a project that started without a geothermal system, for example. We could say that actually this makes a lot of sense and it should have been designed in originally. It wasn't in the original budget so let us add it in. This gave us sort of a flexible funding mechanism that could be applied to projects, regardless of the initial budget, to improve the long term benefits. That is in this year's appropriation request.

Mr. CARNAHAN. Thank you.

Mr. CRAWLEY. Thank you. The dichotomy you are talking about for the Federal sector is also there as well for the private sector. We see a lot of organizations that have that same problem where the operation budget is separate from the capital budget. So it is very difficult for them to make decisions.

The ones that are most successful have combined those. I am thinking of a national grocery store chain where the people responsible for construction of new stores, and they were building many new stores every year, also were responsible for the operation maintenance of those stores. So they knew the decisions they made

in construction would make an impact. They were also responsible for reporting to the CFO and their chairman on operating costs. With very low margins in the grocery sector, an energy impact was taken very seriously because it affected their bottom line.

Like Mr. Kampschroer, I don't think there is a simple answer. But the ones that are looking at it in a comprehensive bottom line aspect when they make a capital dollar investment today including what are the long term operating aspects of that and can they improve, are really the ones that are being more effective.

Mr. CARNAHAN. Thank you. Mr. Helsel.

Mr. HELSEL. I agree there is a dichotomy and no, I am not sure I agree with Mr. Kampschroer approach on this issue. I think there is a dichotomy. I absolutely agree with him there.

I will tell you what we do in the real estate business. We are really talking about managing real property right now, as I understand it. We look at both our operating budget and we look at our capital budget. We decide what we can do with the capital budget based on what the operating budget is allowing us to do based on how much money we make, frankly, on a building. Private industry would say that works well if you watchdog your buildings well. If you don't watchdog your buildings well, it doesn't work so well.

So the dichotomy that Mr. Kampschroer speaks of is absolutely correct. Unfortunately, it falls between several different agencies within the Federal Government, which makes it very difficult to try and work those things out.

But there are other groups who could also, I think, enter into there who can help Mr. Kampschroer work on that. It is a huge project. It is not going to happen overnight. I agree with him in terms of the difficulty and the long term look at how things will occur.

But I can tell you that, and I will be rather self-serving when I say this, there is a group called the Institute of Real Estate Management which provides the preeminent designation for property management in the United States. It is called the CPM designation. I didn't hear Mr. Kampschroer suggest that they were helping GSA do that job or that they have contacted them. It is not an unfair comment or meant to disagree with Mr. Kampschroer. I just think there are other groups in the private industry who do this on a day to day basis.

Typically, I find private industry manages real property better than some of the governmental agencies with which I have done work. I just shake my head because I don't understand how they do it. I am not sure that is the case with GSA. My experience has not been with GSA, in fairness to Mr. Kampschroer. It has been with State agencies.

Mr. CARNAHAN. I would be interested in getting more information about that program and also seeing if there are ways the Government can learn from what you are doing in the private sector.

Mr. HELSEL. We will make sure you get the information.

Mr. CARNAHAN. Thank you very much. Thank you, Madam Chair.

Ms. NORTON. Thank you, Mr. Carnahan.

Mr. Crawley, you may recall that my interest is in making GSA not even a leader, but the leader. The Government, it seems to me,

can't go about telling everybody else what to do if it owns a comparable set of buildings and isn't doing it itself. So I would like to ask you whether in your coordination with GSA you find that the goal of the Government through the GSA, speaking only to the GSA, is to exceed private sector standards in the statute and in practice? Or are we simply trying to meet them? Or are we even trying to meet them?

Mr. CRAWLEY. In our work with GSA, we very much have seen that they are looking to get the best results that they can within the constraints provided.

Ms. NORTON. Mr. Crawley, that is what everyone is trying to do. I am asking about goals. I am not asking are they achieving them. They are limited in part by what we give them in funds and the rest. But we have got a statute here that says, Mr. Helsel, there are certain kinds of things you ought to be doing now. You have got the GSA. All you have to do is look at both of them. I am asking are the goals of the GSA to exceed Mr. Helsel's standards or not?

Mr. CRAWLEY. Yes, they are.

Ms. NORTON. It seems to me that Mr. Helsel, who was a leader and whose realtors have been leaders, ought to be trying to catch up with GSA. That is what the Subcommittee is going to be looking to see. The standard you are setting has to look at the office building sector all over the Country, for example.

Is it not true that office building sector is more responsible for our carbon footprint than any other part?

Mr. CRAWLEY. It is the largest part of the commercial building sector.

Ms. NORTON. No, I am saying commercial buildings as opposed to residential buildings and cars. Which creates the biggest carbon footprint?

Mr. CRAWLEY. Currently, the residential sector and the commercial sector are about equal, both around 20 percent.

Ms. NORTON. We are the largest in the commercial building sector?

Mr. CRAWLEY. Yes.

Ms. NORTON. Now, that means we have an enormous capacity because we are now tipping into more leasing than owning. We have enormous capacity, beyond what Mr. Kampschroer is trying to do with his own inventory, to change the Country. The gold standard for leases is to get yourself Federal lease.

I ought to first ask Mr. Kampschroer, to what extent does leasing require the standards that we have set for ourselves in our own inventory as an item in the RFP, which the GSA uses in deciding who rehabilitates, who constructs, et cetera?

Mr. KAMPSCHROER. I mentioned earlier that beginning in 2010 we will require every building that we move into greater than 10,000 square feet to have an ENERGY STAR rating within the most recent year of operation.

Ms. NORTON. Say that again. By when?

Mr. KAMPSCHROER. By 2010.

Ms. NORTON. That we construct?

Mr. KAMPSCHROER. That we lease.

Ms. NORTON. That we lease?

Mr. KAMPSCHROER. Yes, every building over 10,000 square feet that we lease. There are a few exceptions that are specific in the law. But we have been out publicizing that relatively new requirement.

Ms. NORTON. And that means that those buildings will have to have what?

Mr. KAMPSCHROER. An ENERGY STAR rating, which means that they would have to submit information to the Department of Energy and be certified by a professional engineer. It means that they would be in the top 25 percent of efficiency for buildings that are available in the private sector.

That is a significant change because in this Country, unlike many developed countries, the standard is not to submeter electrical costs to the tenant. Here it is just sort of lumped into the overall rent rate. In most of Europe, Australia, New Zealand, Canada, and Japan, the tenants actually pay directly for the electrical cost and there is a different kind of relationship that you develop with the tenant as the result of that. What the ENERGY STAR rating does is it starts to put us on a similar kind of footing where both we and the tenant are motivated to make changes.

I should also note, too, that if you compare GSA's current inventory, even before the effects of the Recovery Act, our inventory operates at about 26 percent less energy consumption than the commercial comparables. This is in large part due to the long standing emphasis on energy conservation, certainly since the late 1970s, that has been in law. That has affected our decisions and also the investment that the Government has made in energy conservation activities over time.

Ms. NORTON. Indeed. As I noted in my opening statement, GSA is new to energy conservation. But with Mr. Helsel at the same table with Dr. Crawley, who deals not only with our public sector but of course with our private sector, you see here an owner that moved ahead of the breakthrough energy bill. I know that your office deals perhaps primarily with the private sector in not only homes but office buildings, Mr. Helsel, but have you had any relationship with the Department of Energy programs? Do you know about those programs?

Mr. HELSEL. I have not personally had any. I know the National Association of Realtors has put together some pamphlets and some training pieces of material that are good for the consumer. In fact, I mentioned them. Somewhere inside of my testimony, I mentioned where we have actually worked with the Department of Energy to help educate the public on how they could reduce energy costs and things like that. So that is the extent of what I can tell you now in relation to what we have done with the Department of Energy.

Ms. NORTON. Mr. Crawley, would you indicate what kind of relationship your office would have with a typical building owner in the local jurisdictions across the United States?

Mr. CRAWLEY. With a typical building owner, we don't have a lot of direct activity. We have been working with a number of organizations through our energy alliances. The Commercial Real Estate Energy Alliance, with which GSA and Mr. Kampschroer's office are involved, involves over 40 organizations. The leading owners of commercial real estate in the Country came together to help us de-

termine what research needed to be done but also what changes in practices and procurement we could help them with through specifications and other work.

Ms. NORTON. In this city, I have often had the impression, of course, this city may well not be typical and in fact in many ways it is not, that the private sector has long ago understood what was to be gained by energy conservation. The Federal Government may have had a lot to do with that, as a matter of fact, because of our leasing here.

But to what extent is there a consciousness that they are sitting on top of some real money in the private sector if they are not investing in energy efficient systems? Take aside the recession where people can't invest in anything. Is there a consciousness so that you see a rapid movement on the part of building owners into saving themselves some money, let us say, since the terrible rise in energy costs here?

Mr. CRAWLEY. We are seeing that. The leaders in the market are making changes in their buildings. They are beginning to see energy as a real cost center that they can take advantage of to improve their bottom line. Even in the recession they are seeing it as an opportunity to save money and cut costs.

Ms. NORTON. But of course, Mr. Helsel, they don't have quite the funds and they can't go to the banks today to make the initial investment. So what do they do?

Mr. HELSEL. Well, what you just said is true. But I will tell you, much to Dr. Crawley's point, that now more than ever the private industry is looking at how we can save dollars everywhere. They will look at the cost savings and the benefits of doing something now when times are tough, when we are losing tenants, when we can't refinance, and do things like that. We are taking extra time and effort to find where we can save dollars. Energy is the first place we look.

Ms. NORTON. You sometimes have to do it low-tech first because this does take some initial investment, doesn't it?

Mr. HELSEL. You are correct. But I would say that the impetus on everyone, including the private sector, is as strong or stronger now than it ever was. If there is money to be spent somewhere on a building right now, one of the first places we look is how we can save energy.

Ms. NORTON. Mr. Uhalde, I think that people need to understand more about these green jobs. You, in your testimony on page five point, to May 2008 wages and you say that construction and extraction occupations pay a median hourly rate of $18.24 as opposed to $15.57 for all occupations. Is this journeyman pay you are talking about? You say research shows that green construction jobs may be well paying. But then, as you go on, you do not indicate that these rates are for green construction jobs. I have to assume that they are construction industry jobs?

Mr. UHALDE. That is correct.

Ms. NORTON. If a person were to be trained to be an apprentice or a journeyman today, would that normally mean that those who were doing the training would incorporate some green training based on the way in which the Country is moving?

Mr. UHALDE. That is correct. The building and trades and all the apprenticeship programs now are currently building in the latest aspects of green construction into those apprenticeships.

Ms. NORTON. Mr. Kampschroer, I apologize that you happen to be the face of GSA here today and so you had to take the scolding for the Agency. Normally, I like to not scold the messenger. But the responsible figure is Mr. Guerin, whom I personally called, not you. So I do want to indicate for the record that Mr. Kampschroer has no role. Although I would like to you come to this meeting next week because you have had to think beyond the obvious. It was Mr. Guerin that I personally called, which I why, frankly, I am angry. I personally called him. I don't personally call the Agency. Once in a blue moon, I call the staff and say would you make sure people know.

The matter of these jobs is a personal embarrassment to me. We happen to be the capital city. Well, they couldn't avoid it if they were going to do rehabilitation, if they were going to build in the Federal sector. They can't avoid my jurisdiction so of course a lot of it is happening here.

I don't have a lot of issues with what is being done here. I have every indication that the Department of Homeland Security in fact recognizes it has a special responsibility building in the lowest income section of the city. I am pleased with what DHS is doing there.

But I am not pleased that there may be another mid-sized city like this city, like Baltimore, for example, which isn't getting attention now even though that is another Federal sector. And that is why I am very concerned. This was like six months ago that this bill was passed. I will not take another second of it. Sorry.

Actually, GSA was here last week. I do not know why in the world in my haste I did not mention this, and I apologize that I did not, but I called before last week to indicate my serious concern about having to go all the way to the Speaker to say whatever you do, do not put any money out here and then have people in these cities—I know you are going to get a lot of money, but I have got to be able to say to women and minorities and other people who have not been trained that this is the beginning of what we are trying to do, to give you a foothold in the construction industry.

We have got millions of unemployed journeymen. So understand where my concern is. Those are people already prepared to take the jobs. So they have got to be hired instantly, and I want them to be hired. They have been out of work longer than any key people here.

So here we came up with this notion that the reason we do not see many of you is we have had a generation of people not trained. But we do have apprenticeship programs, do we not? We have them at the Department of Labor and, yes, even in the funds we have and funds in the highways part of the bill.

We have been thoughtful enough to understand that we had an obligation, and I am going to see that it is met beginning October 1st. If they have been sitting on their hands and have not thought about it, we are going to help them to think. I cannot express enough anger than when the Chair of the Subcommittee calls that

it does not make a bit of difference to get people moving, even when she indicates one approach to kind of start you off.

So with apologies to you, Mr. Kampschroer, I note that another building that I worked to get ever since I came to Congress, the Department of Transportation building, is the only truly spanking new building here in the District of Columbia and it did not receive a LEED rating. I could not believe it. It is a massive building on M Street. So I have to ask you, why it is not a LEED? How can I know that everything being built in the United States with Federal funds by GSA will be LEED, including the Department of Homeland Security Headquarters?

Mr. KAMPSCHROER. The simple answer is that we signed a contract for the Department of Transportation building before we established the requirement to have leased new constructed buildings——

Ms. NORTON. When was the contract signed?

Mr. KAMPSCHROER. In 2002.

Ms. NORTON. Before you did what? I am sorry.

Mr. KAMPSCHROER. Before we established the requirement that buildings that we lease that were constructed specifically for the Federal Government had to meet the LEED silver standard after that.

Ms. NORTON. So you could not make it actually LEED, realizing that the standard for leasing—it is a pity, people are like how could you possibly be leasing this? This has nothing to do with you. It has to do with Congress and the way it appropriates money and deals with real estate. How could you be leasing a headquarters? You just built it. It will be there for eternity. But that is what you had to deal with and, therefore, you had to deal with the requirements.

Okay, it could be a LEED building. But you have long experience in energy conservation. It seems to me it ought to be pretty close to LEED. Is it or is it not, the DOT building?

Mr. KAMPSCHROER. My understanding from the people who constructed the building is that it is close to a LEED certification. What has not happened is the documentation necessary to know exactly what that is.

Ms. NORTON. I am sorry. You said what?

Mr. KAMPSCHROER. My understanding is that it is close to a LEED certification but we do not have the documentation to know for sure. What we are doing with leasing, and especially with agencies here, we have, for example, the EPA buildings in Crystal City. The two buildings there are both LEED gold. We have, in fact, more LEED certifications of various levels in buildings that we lease than in buildings that we own to date.

Ms. NORTON. Say that again.

Mr. KAMPSCHROER. We have more buildings that are leased that are LEED certified at various levels than buildings that we own.

Ms. NORTON. Because they are newer?

Mr. KAMPSCHROER. In many respects. They can operate a little bit more quickly than Federal construction can. But they both have the same requirements right now.

Mr. NORTON. Mr. Kampschroer, some building manager, somebody has got to know how much of what conserves energy is in that

building. I am sure there are some things in this building. I would like within 30 days to know what the energy conservation features of the DOT building are. I would like to know whether or not you could go back and see if the building could be LEED certified. Based on your prior experience, you already understood, GSA, what should go in the building. I need to know how energy efficient this brand new building is, which is a headquarters building.

It cannot move out of the District. We are going to be in there for perpetuity just like the Justice Department, and I need to know how close it comes to being a LEED building and what its basic features for energy conservation are.

Mr. KAMPSCHROER. I would be happy to provide that.

Ms. NORTON. What are the staffing goals? We have heard about your office and you seem deeply knowledgeable. If we are serious about your office, you will need staff. What are the planned staffing levels?

Mr. KAMPSCHROER. The current planned staffing levels, we are in fact classifying and recruiting even as we speak, are to have approximately seven or eight people in addition to myself focused on the Government-wide responsibilities and four or five people focused on the GSA responsibilities relating to high-performance green buildings.

Mr. NORTON. I do not know how to judge that. How many people are in the office now?

Mr. KAMPSCHROER. Three.

Ms. NORTON. Had you worked in this field before?

Mr. KAMPSCHROER. Yes. Actually, prior to this job I was working with the energy programs of GSA, as well as the environment programs and the research program within GSA, which is modest applied research focused on those things that are not within the ambit of the Department of Energy or anyone else doing major research. Before that, I was the research director of GSA and worked on development of some basic research into how buildings affect human performance. For that I worked in the Office of Portfolio Management, sort of the basic asset management functions of the agency.

Ms. NORTON. I appreciate that the Agency, particularly because this has all occurred before it has a new head confirmed, has put into the office someone like yourself who has deep background in this area.

Would we even consider building a courthouse today that was not LEED certified?

Mr. KAMPSCHROER. We would not. It has been a requirement since 2000 that, beginning with buildings in 2003, they be LEED certified. Today the requirement is LEED silver.

Ms. NORTON. Mentioning gold and silver, what did you say?

Mr. KAMPSCHROER. The requirement today is that the minimum requirement is LEED silver and every contract has an expressed goal of achieving LEED gold.

Ms. NORTON. What is the difference in savings to the Government ultimately, roughly speaking? Maybe this is to Mr. Crawley as well.

Mr. KAMPSCHROER. Roughly speaking, based on that study that I mentioned earlier, we can expect savings for gold and platinum

ratings to be roughly double those for certified, which is the lowest level.

Ms. NORTON. Are they so much more costly that you would not almost automatically do them? Let us take the Department of Homeland Security, since we are going to be there. We are going to be at the Department of Transportation forever even though it is a leased building so imagine how long we are going to be at the old Saint Elizabeth site. Why would we not want to go platinum knowing that that will be outstripped in our lifetime and that the savings are already calculable even though it means somewhat greater investment now? Indeed, how much greater investment is there, relatively speaking? So much so that it becomes a real factor or not, a factor considering the savings and the payback?

Mr. KAMPSCHROER. A platinum building, you can certainly measure the additional cost. At the silver level, you can, with good integrated design, achieve the benchmark goal within a typical building budget. It is a question of applying those resources effectively and using the kind of integration of systems, technologies, sitings, and building use.

Ms. NORTON. When you say effectively, what do you mean? Do you mean that it is such a high level of expertise or skill level that it would be difficult?

Mr. KAMPSCHROER. Integrated design is something that the profession got away from in the 1950s, 1960s, 1970s, 1980s, and even 1990s. So what you had delivered in this Country, by and large, were buildings that were designed in stovepipes. Mechanical engineers would typically say it does not matter, you can design the building any way you want and we will build you a mechanical plant that will cool the building. Of course, we ended up creating sick building syndrome by that kind of thinking.

So what is really needed here is a reapplication of things. Let us say Michelangelo knew that everything relates to everything else and the decisions you make on the envelope, on the way the building faces, and on how you move in and out of the building have a long term effect on how healthy the building is but also on how well it performs. And that form of integrated design is something that is coming back into play. But we do not see it all the time. You can look around the Country and not see it in private sector buildings that are being built. So it is still the minority way buildings are being put up.

Ms. NORTON. Well, when you have an opportunity to build three buildings for the Department of Homeland Security, is there any case to be made for anything other than platinum?

Mr. KAMPSCHROER. It is a balancing act of cost and performance at the platinum level.

Ms. NORTON. How much? I need to know. Maybe Mr. Crawley can answer as well. Since we know the payback can be very substantial and the building is going to be there forever, what percentage more? Is it 15 percent more to construct a platinum building? Is it 50 percent more? Give me just some rough ballpark figure between you and Mr. Crawley that you can agree on.

Mr. KAMPSCHROER. Platinum buildings are pretty few and far between right now, so I am not sure that we have——

Ms. NORTON. What is a platinum? To be platinum, what would you have to have?

Mr. KAMPSCHROER. You would have to have everything working together in the building to the maximum extent.

Ms. NORTON. Everything has to be——

Mr. KAMPSCHROER. One building I am familiar with that is platinum, actually we have one building in our inventory which is an existing building that was retrofitted under the existing building program. It is actually the first platinum building in the Country. It is an FBI field office in Chicago. The other one is the Genzyme office building in Cambridge, Massachusetts. I am going to give you the Genzyme one because I have physically been through it and it comes to mind. The Genzyme building, compared to a typical specification office building in Cambridge, Massachusetts, was about almost 30 percent premium.

It was worth it to the company because they are a niche developer of pharmaceuticals and their niche is they develop the pharmaceuticals for illnesses that have a relatively small population. So you are talking about a drug with a lot of benefit but maybe to only 10,000 people. So that is their niche.

They have a very strong human focus and so they did a lot of things. There is a very large atrium that goes all the way down through the middle of the building that cascades light through the building, So you have 100 percent of the building that is day-lit. In a standard commercial office building that would be considered floor space that was an opportunity that was lost. So you have a significant cost premium associated with that. They have operable windows throughout the building that are tied into the control system and a double facade since this is in Cambridge, Massachusetts. Again, double the cost for the facade but with significantly greater performance. It does pay out in the total life cycle cost of the building but this is really pushing all of the technology pretty much to the extreme there. That is the kind of example.

As we are going forward on Saint Elizabeth's, we are pushing the developers and the designers of that site to give us the maximum amount within the budget. We are looking to improve considerably from even the original concept. There are a lot of creative things already being done with the site with water management on the site, with low impact development around it, with the way that the roof is treated and the way the water is handled on the roof, and a variety of other things. I am sure we would be happy to give you more details on where we are today. But we are also pushing them to deliver the maximum that the budget will allow.

Ms. NORTON. I very much appreciate it. Is gold next down from platinum?

Mr. KAMPSCHROER. Yes.

Ms. NORTON. Is this going to be a gold building?

Mr. KAMPSCHROER. I would hope so. That is the goal for the building. The developer of the EPA site has gone on record saying he can deliver a gold building for the market comparable rates. So I think that is a very reasonable goal for the building.

Ms. NORTON. It is very gratifying to hear. I want to ask my questions for the others here.

I have a question for Mr. Uhalde on women. When I went to a meeting on another subject during the time that the stimulus was being considered, there was a huge gathering—I do not recall the purpose—of women from across the Country. Before a few Members of Congress were introduced, the person who was introducing the event said that we were doing a stimulus package in the Congress and they did not have any indication that women will get any of these jobs. I was glad I was there because I indicated that there would be certainly a small amount in my package, a larger amount in your Department's package, and that the Administration was fully aware that women and minorities had been left out of the growth of the sector.

In your testimony, you mention a specific program aimed at women. Because if minorities are left out, women are a real afterthought in construction. So would you describe that program for us, please?

Mr. UHALDE. Yes. We have Women in Apprenticeship in Non-Traditional Occupations programs, $1 million. We focus it on apprenticeships and try and ensure with the grantees—I believe we have five or six grantees—that women are able to get the training, get the pre-apprenticeships and into apprenticeship programs principally in the building trades.

We also had $750 million of competitive grants for both green training and health care and high growth occupations. Secretary Solis is very interested in making sure the populations that are left out of high growth occupations get a shot, and that includes women in non-traditional occupations. So we put out the solicitations for grant applications and made emphasis on populations that had been left out traditionally, including minorities, school dropouts, and veterans populations that are under served in some of these, and women as well.

Ms. NORTON. Thank you. You really do have a haul of money and I know you will be careful in the way you spend it. I think you have most of the money for these green jobs and I am pleased with the thoughtfulness you are inclined to in this area. The Administration is going to be watching this very closely.

Mr. UHALDE. Absolutely.

Ms. NORTON. Mr. Kampschroer, we had a hearing in May of 2008 where we questioned GSA about, and it surprised us, energy inefficient products on the GSA's schedules. What is the status of those products being removed from the schedules? We know that occasionally an agency may have no choice but we are talking about products. So I am assuming that these are products where there might be a choice. Where are we on that so that agencies cannot have the choice of making the taxpayers spend more money for energy where there is an available energy efficient selection for them?

Mr. KAMPSCHROER. There have been new guidelines recently issued by the Department of Energy addressing that very issue that you raise of choice and when you should make it and when you should not.

Ms. NORTON. When should you ever make it unless your infrastructure requires you to make it?

Mr. KAMPSCHROER. That is the idea. That is only where you cannot use the other materials. But what we have done internally is

we have, first of all, highlighted the electronic version of all the schedules so all of the energy efficient products appear with a separate kind of designation within the schedules. They are segregated. They are the ones that pop up first when you look for them.

And second of all, we have instituted in the online ordering system within GSA a warning so that if somebody inadvertently orders something for which there is a more energy efficient product, it says you should not be ordering this. Did you know that there is a law that——

Ms. NORTON. That actually is so excellent and so un-government-like and so un-GSA-like that somebody says oops. That is what you expect Mr. Helsel to do. Thank you. Yes.

Mr. KAMPSCHROER. The third thing I wanted to mention is that we are working with the Department of Energy and EPA so that our database of scheduled items has a direct feed from their database of approved items so that when we get the ENERGY STAR designation, we know that it is the most up-to-date designation of those. In fact, we are meeting with Department of Energy next week to keep that project going. Then, when that happens, you know that you can be assured that it is not some supplier alleging that it is an ENERGY STAR device, that it actually is and we know that from the source.

Ms. NORTON. That is really giving the priority that the Subcommittee, the Speaker, the House, the Senate expected. I am very pleased to hear that.

I must ask Mr. Crawley about net zero energy building. I do not understand what that means.

Mr. CRAWLEY. A net zero energy building is a building that produces on-site as much energy as it needs over the course of a year.

Ms. NORTON. Now we are talking.

Mr. CRAWLEY. It is the next generation beyond platinum.

Ms. NORTON. That is heaven.

Mr. CRAWLEY. It will help us get a long way toward the goal of really reducing the impacts and——

Ms. NORTON. Now I recognize that. What is the largest building like that in the United States?

Mr. CRAWLEY. The largest one I know of is about 18,000 square feet.

Ms. NORTON. That is the wave of the future, people. Make your own. I am sorry, go ahead.

Mr. CRAWLEY. There are very few buildings and they are pretty expensive right now. But somebody is paying for them and thinks it is cost-effective.

Ms. NORTON. What is it, kind of a pilot or experimental?

Mr. CRAWLEY. They may be a pilot, experimental or they have found a donor that thinks it is a worthwhile investment over the life of that building.

Ms. NORTON. So where are we? This is the kind of stuff we should have been experimenting with a generation ago. I concede that we did not know very much. One of the big surprises to me is that our science, which is usually so advanced beyond what we are able to do, seems not to have been where I might have expected it to be. I know this is fairly futuristic but I do not see another way

to go. I can see no way to be serious about climate change going the way we are going.

I went with the Speaker to India. We did not go there about, for example, their nuclear issues or Pakistan. This was when we first came into the majority. We went there about climate change. I tell you, they already have goals for a carbon footprint that will come nowhere near ours. We went there to speak to the Chinese. Imagine, having the people who created the carbon footprint that is destroying the planet coming to these two countries and saying why don't you all do your share. It was hard for me to get the words out of my mouth, particularly at a time when we had not even passed our energy bill, the first one that we passed.

So as I think about the position that we are all in—that that would require sacrifice, that it really ought to be you first in Europe and then we will see what we can do instead—China and India are ahead of us in part because what they are bringing online is necessarily more inefficient. They have the benefit of the science of today.

But there is just no way to avoid our leadership role given our role in creating the problem in the first place. So looking at it, that is why I have been so interested in what Mr. Kampschroer and Mr. Crawley are doing and what feeds in to what you are doing.

Short of a shortcut through technology that will say okay, everybody one, two, three, sacrifice, I do not see that mentality even in the most advanced thinking about greening. In fact, I see the kind of mentality I see in the health care bill, which is everybody is going to get everything you get now and even more, and then we are going to put some more people into the mix and it is not going to cost the Government any more and there will be no deficit. I just think that is the kind of thinking that builds up in the world in which there are endless resources.

It took a long time for it to click in that we do not have it. Well, the Malthusian notion we would reproduce ourselves did not come true. I believe putting as much in technology as we can is the only serious answer to short-cutting our problems on the planet before it disappears.

I have only a couple more questions. At the same time I am trying to green the capital region because of the GSA footprint, the District of Columbia, one little city, is doing a lot on its own. We have 98 million square feet in the national capital region. It is a pretty progressive region.

Are there efforts to coordinate with these folks who can build upon this? They help us and we help them, not with money but how we play off of one another?

Mr. KAMPSCHROER. Indeed, there are. One of the areas that we are working with the District of Columbia in is stormwater management. We are, jointly, after the significant flooding along Constitution Avenue in front of the IRS. We have been working with them to find out A, why did that happen so cataclysmically, and B, what can we do about it. We have jointly funded a study which is about to begin to figure out the appropriate solution to that.

We are looking at all of our projects to increase the ability to do stormwater management. In fact, we have 400,000 square feet of planted roofs within the District of Columbia already and over 1

million square feet in the Washington metropolitan region. We are working with the District of Columbia on aspects of building technology so that we make sure that we share the information that we develop in building technology with the District of Columbia and vice versa. I am sure there are others that I just——

Ms. NORTON. I know. I would like to ask that with COG, Council of Governments, there be some coordination to take advantage of the progressive jurisdiction where at least the national capital region is situated.

Let me say to you, Mr. Kampschroer, I would ask you to look at this and get back to me within thirty days. The Federal Government is the biggest ratepayer for water in the District of Columbia. The District of Columbia has just passed a bill, actually some months ago, that is just the way the Country ought to be going. It says that if you have an impervious surface so that your runoff flows into the Anacostia River out to the Chesapeake Bay and into our waters, there is going to be a surface charge. For most homeowners, this is not anything they can do anything about and must contribute to. This is aimed at big folks like the Federal Government and office buildings.

There are a lot of things you can do around your, let us say, parking lot besides repave it, for example, just to catch the water. But we believe, based on the charges that the District of Columbia has begun—the rebate schedule and all has not come out yet—that the Federal Government would have at least $1 million more to pay for impervious surfaces such as parking lots, outer Federal buildings, and the like.

Here is an area where there has not been much reason to look before. But I would ask you to be in touch with those—I am sure there are people at GSA who are already aware of this—and in 30 days give me some idea of how you believe the Federal Government could keep from being the biggest payer into this charge for impervious surfaces.

Mr. KAMPSCHROER. I would be happy to do so.

Ms. NORTON. In the 2009 conference report for the Financial Services appropriation where the GSA appropriation is found, I included a proposal to study the measurable benefits associated with green roofs in the GSA owned and leased inventory. We used the national capital region because of the huge footprint here. Could you give us the status of that study?

Mr. KAMPSCHROER. I cannot because I cannot remember it off the top of my head. If I could get back to you, I would appreciate it.

Ms. NORTON. In thirty days, if you would, Mr. Kampschroer, get back to me.

Here is my final question. I am interested in these energy performance contracts. Would you describe what an energy performance contract is and whether or not GSA has them? What is the average amount that we might reap from such contracts? I do not know if Mr. Helsel has any information on these. He is saying no. But I believe you have some energy performance contracts that work.

Mr. KAMPSCHROER. Yes, we do. We have at the moment 52 active energy savings performance contracts either directly with private

firms or with utilities, as well as 14 that have been completed already and have been paid off.

Ms. NORTON. I am sorry. Would you repeat that please?

Mr. KAMPSCHROER. I would be happy to. We have currently active 52 energy savings performance contracts. We have 14 where they are no longer active because the work has been done and the investment has been paid off.

Ms. NORTON. Where are they located? Across the United States?

Mr. KAMPSCHROER. Across the United States. Several of them are here in this area.

Ms. NORTON. Have you described what an energy performance contract is?

Mr. KAMPSCHROER. I am sorry. I just jumped into the statistics. The energy performance contract is a contract for a long period of time in which private capital is brought to bear to increase the energy performance. The payment to the firm that invests the private capital is made out of the difference between the energy bill before the capital investment and the energy bill afterwards. So the savings from reduced energy consumption pay back the capital investment as well as the operating costs of the building.

Ms. NORTON. Are those generally available across the United States?

Mr. KAMPSCHROER. They are available across the United States. We principally use the Department of Energy Super ESPC program. As well, we are increasing the GSA schedules to have those kinds of features. There are also private sector energy savings performance contracts in some areas of the Country. But it is less prevalent outside the Government than it is in the private sector, and more prevalently offered by utility firms where the public utilities commission has provided that capability with the utilities to do so.

Ms. NORTON. I am just trying to figure out why we would not have them in our buildings in the regions.

Mr. KAMPSCHROER. We do have them across the Country. We are currently negotiating several even as we speak. We are also——

Ms. NORTON. So wherever there is a possibility to have an energy performance contract, we will engage in such contracts?

Mr. KAMPSCHROER. Yes. Our plan is to significantly expand our use of energy savings performance contracts. We had that plan developed before the Recovery Act and we have honestly shifted our emphasis onto making sure that the Recovery Act expenditures go quickly. But we are also looking at the possibility for making sure that in a building where we are doing the building tune up only, we are looking at the possibility of using an energy savings performance contract for doing other systems work in the building so that we will get more for that building than we are even able to get from the Recovery Act funds directly.

Ms. NORTON. That is an important add-on to make sure that this is sustainable for the funds we invest.

As you can see, these hearings for me are perhaps a little atypical. I use them to really educate myself about areas. I find myself kind of a generalist—most Members are—not having deep knowledge about even this area that I have been conversant with ever since coming to Congress. So your testimony has been very impor-

tant to my oversight, to giving me indications of the kinds of things I ought to be doing to be helpful.

I want to thank each and every one of you for the time you have spent with us this afternoon and to say to you how helpful you have been. So thank you very much.

The hearing is adjourned.

[Whereupon, at 5:00 p.m., the Subcommittee was adjourned.]

**OPENING STATEMENT OF**
**THE HONORABLE RUSS CARNAHAN (MO-03)**
**HOUSE TRANSPORATION AND INFRASTRUCTURE COMMITTEE**
**SUBCOMMITTEE ON ECONOMIC DEVELOPMENT, PUBLIC BUILDINGS, AND EMERGENCY MANAGEMENT**

**Hearing on**
Green Buildings Offer Multiple Benefits: Cost Savings, Clean Environment, and Jobs

Thursday, July 16, 2009
2167 Rayburn House Office Building

Chairwoman Norton and Ranking Member Diaz-Balart, thank you for holding this important hearing on the benefits of green building.

As a co-founder of the High-Performance Buildings Caucus, I have advocated not just for green buildings, but high-performance buildings. High-performance buildings incorporate the holistic systems approach of energy efficiencies, water savings, use of recycled and recyclable materials, life cycle analysis, and other environmental attributes into designs that are accessible, safe and secure, resilient, and, in many cases, historically preserved. These high-performance buildings are not just examples of raw technical ingenuity; they are also inherently designed to decrease consumption and thus the overall cost of the building over the course of its lifetime.

I believe that the federal government should lead by example in the way we construct and manage our federal building stock. By investing in high-performance buildings, we not only help bring about much needed economies of scale for these technologies, but we also support highly skilled construction workers, builders, architects, maintenance engineers, to name a few.

By designing and building high-performance buildings, we reduce energy consumption and our carbon footprint. We save both water and raw materials. We save demolition and construction debris from going to landfills. Most importantly, high-performance building construction creates good paying jobs that give workers the valuable skills they need to excel in a clean energy economy.

I would like to give special thanks to the High-Performance Building Congressional Caucus Coalition who at my request produced detailed recommendations for producing High-Performance Federal Buildings. These recommendations focus on requiring true life-cycle analysis for the acquisition of Federal buildings, requiring total building commissioning, using building information modeling and integrated project delivery, just to name a few. I would ask unanimous consent that these recommendations be submitted for the record.

To the witnesses before us today, I want to thank you for taking the time out of your busy schedules to appear before us and I look forward to hearing your testimonies.

Eleanor Holmes Norton

**STATEMENT**
**ELEANOR HOLMES NORTON**
**JULY 16, 2009**
**GREEN BUILDINGS OFFER MULTIPLE BENEFITS: COST SAVINGS, CLEAN ENVIRONMENT AND JOBS**

Welcome to today's hearing with particular appreciation to our distinguished witnesses for their testimony. The subcommittee will examine plans for green buildings and the benefits in a rapidly changing world. Since becoming chair of the subcommittee, I have been plain that one of my priority goals is to maximize the General Services Administration's (GSA) outsized real estate and property portfolio to make the agency the green buildings industry leader. My first greening hearing focused on the greening of Washington D.C. and the national capital region where the GSA is the leader in the office building market. The GSA engaged in energy conservation efforts well before climate change issues became prominent because the agency has long understood the energy value and savings to the taxpayer. However, with a new administration taking unprecedented leadership in conservation and climate change, we are seeking ways to build on the progress we began in the 110th Congress.

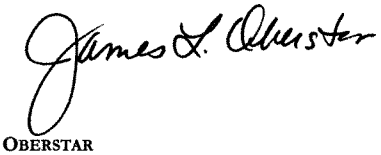
With the path-breaking Energy Independence and Security Act of 2007 (P.L. 110-140), I am pleased that, among other things, the bill authorized high efficiency light bulb replacement; a photovoltaic provision; and the creation of an office of High Performance Green Buildings that is required to coordinate with the Department of Energy, which is focusing on green issues in the private sector. I am pleased that today we will hear from both the GSA Office of High Performance Green Buildings, as well as from the Department of Energy. As important as these breakthrough initiatives were, they seem timid in light of the GSA's potential impact, especially on leasing, but also on its own inventory and on the economy and climate change in the nation. The President was of the same mind when he worked with our subcommittee to place in the stimulus package $5.5 billion, much of it for repair and rehabilitation of GSA's badly deteriorated inventory. In addition, we achieved stimulus funding for GSA's first building in the new Department of Homeland Security headquarters compound to be located in St. Elizabeths West Campus. The DHS headquarters provides a unique opportunity for the government to build an entirely green set of office buildings, the largest construction in the GSA's history. With little imagination, the potential for energy conservation at the new headquarters is bountiful.

Green building activities generally cover products and practices that conserve energy and water, promote clean indoor air, protect natural resources, and reduce the impact of a building on a community. Examples include insulation, such as double paned windows that reduce or conserve the heating loads of buildings, and positioning buildings in order to reduce the need for cooling or heating the building. Green building includes reduced flow toilets and low water-need plants for landscaping. Green building improves the indoor environment with use of non-toxic caulks and adhesives, non formaldehyde cabinets, and the use of filters. Green building protects natural resources by promoting the use of products with recycled content like carpet, tile, and wall board, while promoting the use of rapidly renewable products like bamboo flooring and natural linoleum. Green building protects waterways like the Anacostia and the Chesapeake Bay by promoting practices that reduce the impact of structures on the environment such as mitigating the effects of storm water runoff, using green roofs, cisterns, and permeable pavers, locating buildings close to mass transit and including bike racks and storage units.

With GSA in the throes of redoing existing inventory in all 50 states, the District of Columbia and all the territories, and with an emphasis on energy conservation, the GSA headquarters, along with GSA's rapid ascendency in the leasing market, the subcommittee is especially interested in new frontiers in green, not only thinking, and but in green action, steps that can be taken now; in greening and conservation practices such as reusing water and energy; in various types of green roofs, especially for existing buildings; in the difference and value among various LEED designations; in energy saving technology; and in reducing practices that harm the environment in constructing and leasing near waterways. We also, of course, want to draw on the rapidly developing data on comparisons of cost to benefit and cost reductions that are actually resulting.

Equipped with the largest footprint in the private leasing market in the United States and one of the most consistent presences in the construction market, GSA must not let the opportunities slip away. Our goal is to invigorate the federal leadership role in green technologies, greening strategies and high energy standards in all new construction and in major replacements and repairs. Using new resources, GSA must become a trend setter in spin off green job creation and job opportunities especially during today's recession.

I welcome today's witnesses and an eager to hear their testimony.



**STATEMENT OF**
**THE HONORABLE JAMES L. OBERSTAR**
**SUBCOMMITTEE ON PUBLIC BUILDINGS, ECONOMIC DEVELOPMENT, AND EMERGENCY MANAGEMENT**
**HEARING ON: GREEN BUILDINGS OFFER MULTIPLE BENEFITS: COST SAVINGS, CLEAN ENVIRONMENT AND JOBS**
**JULY 16, 2009**

I am pleased to welcome our witnesses here to testify to about how "green" building will impact Federal construction, the American economy, and job creation. "Green" building incorporates aspects of energy conservancy in new construction, and it focuses on minimizing the impact of a new building on the environment, while using state of the art technology for energy efficiency. The General Services Administration (GSA) has been tasked with converting several hundred Federal facilities to "green" building with funds from the American Recovery and Reinvestment Act (Recovery Act)(P.L. 111-5).

Today, we will hear from the GSA Office of High Performing Green Buildings, the Department of Energy Building Technologies, the Department of Labor and the private sector, about the state of "green" building in the United States and how it will affect facilities management. In addition, this hearing will assess the new "green" economy as it begins to produce new jobs and opportunities. I am interested in how

the Federal government is partnering with the private sector and States in promoting energy efficiency in new construction, and providing training for new "green" jobs.

The Recovery Act provided $5.55 billion for GSA construction and alteration projects, with a focus on "green" building initiatives. On March 31, 2009, the GSA Public Building Service Spending Plan was released, and highlighted the spending in the Recovery Act that was dedicated towards transforming Federal buildings into high performance green buildings. The total amount allocated was $4.3 billion to over 200 projects across the country. The purpose of these funds is to make Federal buildings more energy efficient and, where possible, to use renewable energy generation.

This hearing is the fourth hearing designed to ensure that best, and most environmentally-sound methods are being used in Federal and commercial building construction. The Federal Government has the largest footprint in the private leasing market in the United States, and has one of the most consistent presences in the construction market. Therefore, the Federal Government has an excellent opportunity to show real leadership in "green" building. My goal is to invigorate the Federal leadership role in energy conservation and renewable technologies, and in the use of other "greening" strategies. Such "greening" strategies include photovoltaic

and green roofs, tree planting, and requiring nationally recognized Leadership in Energy and Environmental Design or "LEED" standards, or similar standards in all new construction, and when major replacements and repairs are conducted.

I look forward to receiving testimony from today's panels about how "green" building will affect building construction and the economic landscape going forward.

I thank all of our witnesses for their participation in today's hearing.

**STATEMENT OF**

**DRURY CRAWLEY**

**COMMERCIAL BUILDING RESEARCH TEAM LEAD, BUILDING TECHNOLOGIES PROGRAM**

**OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY**

**U.S. DEPARTMENT OF ENERGY**

**BEFORE THE**

**SUBCOMMITTEE ON ECONOMIC DEVELOPMENT, PUBLIC BUILDINGS, AND EMERGENCY MANAGEMENT**

**COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE**

**U.S. HOUSE OF REPRESENTATIVES**

**JULY 16, 2009**

Chairwoman Holmes Norton, Ranking Member Diaz-Balart, Members of the Subcommittee, thank you for the opportunity to appear before you today to discuss the U.S. Department of Energy's (DOE) Building Technologies Program activities and the enormous potential for energy savings in the buildings sector.

In 2008, the Nation's 114 million households and more than 74 billion square feet of commercial floor space accounted for nearly 40% of U.S. primary energy consumption, as well as:

- 73% of electricity and 34% of natural gas consumption,
- Energy bills totaling $418 billion, and
- 39% of Carbon Dioxide, 18% of Nitrogen Oxide, and 55% of Sulfur Dioxide emissions.

Additionally, construction and renovation accounted for 9% of GDP, and eight million people were employed in the sector.[1]

The Department is committed to improving energy efficiency in buildings from advances in building technologies and systems, to energy codes for new construction, to weatherization retrofits and promotion of efficient appliances. The Administration continues to renew and build upon these efforts. I would like to give a broad overview of the Building Technologies Program and highlight some of its ongoing activities, particularly regarding commercial building technologies and partnerships.

**DOE's Building Technologies Program**

The Building Technologies Program develops technologies, techniques, and tools, as well as minimum performance standards, for making residential and commercial buildings more energy efficient, productive, and affordable. The program's current goal is to create technologies and design approaches that enable net-zero energy buildings[2] at low incremental cost by 2020 for residential buildings and 2025 for commercial buildings. The program expects that efficiency technologies and designs will have application to buildings constructed over the next several years, resulting in incremental reductions in energy use throughout the sector.[3]

The research and development (R&D) activities of DOE's Building Technologies Program are fully aligned toward enabling the widespread construction of net-zero energy residential and commercial buildings by 2020 and 2025, respectively. The Commercial Buildings Integration subprogram conducts systems integration R&D, works with national energy alliances on best practices, engages national accounts with research technical assistance to

[1] DOE, *2008 Building Energy Data Book.*
[2] A net-zero energy building is a residential or commercial building with greatly reduced needs for energy through efficiency gains (60 to 70 percent less than conventional practice), with the balance of energy needs supplied by renewable technologies.
[3] DOE, *2008 Building Technologies Multi-Year Program Plan,* http://www.eere.energy.gov/buildings/publications/pdfs/corporate/myp08complete.pdf.

achieve deep energy retrofits and design of high performance new building prototypes, and provides targeted mass procurement and technology solutions to the industry.

The Residential Integration subprogram works through the Building America public-private partnership to develop high performance residential sub-systems and whole house energy improvements, and testing them on a community scale. In addition, the Residential Integration subprogram is implementing the Builders Challenge to deploy the results of the R&D activity, and is implementing efficiency technologies in new homes and catalyzing cost effective retrofits in homes throughout the Nation.

Equipment and component research is designed to fill identified gaps in technical performance and/or cost reduction needed to fully achieve the net zero energy cost and performance goals of the commercial and residential subprograms. Component and equipment research is conducted on Solid State Lighting; Heating, Ventilation, Air Conditioning, Refrigeration and Water Heating; Solar Heating and Cooling; Thermal Envelope and Windows; and Design Tools.

The Appliances and Commercial Equipment Standards Program develops test procedures and energy conservation standards for residential appliances and commercial and industrial equipment. The Program develops regulations that manufacturers must adhere to in making energy efficiency claims as well as in manufacturing products for sale in the United States. These regulations apply to products manufactured in the United States as well as those imported into the United States.

The Department's Building Technologies Program and its partners strive to integrate energy efficient technologies into the marketplace through technology validation and market introduction activities such as Builders Challenge, Building Energy Codes, EnergySmart Hospitals, EnergySmart Schools, ENERGY STAR®, Solar Decathlon, and the Utility Solar Water Heating Initiative ($USH_2O$).[4]

I would like to underscore the significant potential benefits that would accrue to the Nation if the goals of the Building Technologies Program are achieved, from net-zero energy commercial buildings to efficient appliances for consumers that will contribute to technological advancements and significant energy savings. We typically measure our success in energy savings. These energy savings translate into benefits to consumers through reduced energy bills, cleaner air and water, and the avoidance of greenhouse gas emissions and the potential harmful effects of global climate change. However, we must also be conscious of the potential impact our efforts have on employment. I am happy to report that these goals and the effects on employment, the news is positive.

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[4] More information is available on each of these programs at the following links:
Builders Challenge: http://www1.eere.energy.gov/buildings/builderschallenge.html
Building Energy Codes: http://www1.eere.energy.gov/buildings/energycodes.html
EnergySmart Hospitals: http://www1.eere.energy.gov/buildings/energysmarthospitals/
EnergySmart Schools: http://www1.eere.energy.gov/buildings/energysmartschools.html
ENERGY STAR®: http://www1.eere.energy.gov/buildings/energystar.html
Solar Decathlon: http://www1.eere.energy.gov/buildings/solar_decathlon.html
Utility Solar Water Heating Initiative ($USH_2O$): http://www1.eere.energy.gov/buildings/ush2o/

Achieving the Program's goals of reducing the cost of advanced building technologies and homeowner energy bills will permit consumers to spend these saved dollars elsewhere, stimulating other parts of the economy and potentially resulting in cumulative net consumer savings of nearly $450 billion by 2030 and nearly $3.4 trillion by 2050. In addition, cumulative savings to the electric power industry are expected to be over $300 billion by 2030 and over $1 trillion by 2050.[5] These estimates do not include potential benefits associated with projects funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act).

We have begun to think even more broadly about the impact of our program. The buildings sector is a huge part of our economy. It has suffered in the recent economic downturn, but remains a critical engine of future growth. In 2006, the building construction trades employed over 7.5 million workers. Related trades such as architecture and equipment manufacturing employed another half million.[6] These numbers have decreased, but the Buildings program may have a positive impact on the future employment picture. One recent analysis found that, by the year 2030, DOE's efforts "have the potential to increase employment by up to 446,000 jobs, increase wage income by $7.8 billion, reduce needs for capital stock in the energy sector and closely related supporting industries by about $207 billion and create net capital savings that are available to grow the nation's future economy."[7] These estimates were made prior to the new increased investment on building and home efficiency programs established under the Recovery Act.

Finally, we know that buildings impact the economy beyond the building footprint. In electricity use, for example, flipping on a light switch means fossil, nuclear, or renewable energy power plants must meet that demand. Buildings also impact land use through supporting infrastructure such as roads, bridges, street lighting, wires, and pipes. Consider water usage as just another example. Most building energy use does not directly impact water, yet the water impact of energy production is very large, via generation plant cooling requirements. Thermoelectric-power withdrawals accounted for 48 percent of total water use, 39 percent of total freshwater withdrawals for all categories, and 52 percent of fresh surface-water withdrawals in 2000.[8] As a result of energy savings through our program efforts, we estimate that we can avoid freshwater withdrawals of almost 2.5 trillion gallons a year by 2030.

A 2008 study by Pacific Northwest National Laboratory suggests that a more aggressive, sustained effort in R&D, regulation, and deployment could result in energy savings of 8.5 Quadrillion Btu per year by 2025 – equivalent to the total primary energy consumption of California each year.[9] These energy savings might further result in a cumulative avoidance of an estimated 4.4 Gigatons of $CO_2$ emissions between now and 2025, which equates to over

[5] Budget of the United States Government for Fiscal Year 2010
[6] Buildings Energy Data Book, Tables 1.3.7 and 1.3.8 (http://buildingsdatabook.eren.doe.gov)
[7] MJ Scott et al, Energy Economics 30 (2008) 2283–2301
[8] Source: U.S. Geological Survey Circular 1268, "Estimated Use Of Water in The United States in 2000 (http://ga.water.usgs.gov/edu/wupt.html)
[9] JA Dirks, et al, "Lost Opportunities in the Buildings Sector: Energy-Efficiency Analysis and Results," Pacific Northwest National Laboratory, September 2008, PNNL-17623

10% of the projected cumulative $CO_2$ emissions from the buildings sector over that same period. These energy savings, if realized, would cause total primary energy consumption in the buildings sector to level off over the 2009-2025 study period, to just below 2009 consumption levels.

**Commercial Buildings Initiative**

Launched in August 2008, the Net-Zero Energy Commercial Building Initiative (CBI) is the umbrella initiative that will guide and coordinate public and private partnerships to advance the development and market adoption of net-zero energy commercial buildings (NZEBs). CBI works with researchers at DOE National Laboratories, as well as with public and private partners, to achieve the goal of marketable NZEBs by 2025.

In support of the CBI, DOE's key commercial buildings research includes whole building system integration, indoor environmental quality, control strategies and diagnostics, space conditioning, and process and miscellaneous equipment. Another major area is the development of technology solutions for achieving 30-50% savings at the building system level (lighting, heating, and cooling). The first technology solution, Commercial Lighting Solutions web tool design aid, launched in May 2009.

Working with industry representatives and partners is critical to achieving the goal of marketable net-zero energy commercial buildings by 2025. We are engaged with building industry leaders through energy alliances and research partnerships to move us toward that goal. Key CBI alliances and partnerships include:

- Commercial Building Energy Alliances – Informal associations of commercial building owners and operators who work to significantly reduce energy consumption and carbon emissions. Currently, alliances exist for retail, commercial real estate, and hospitals.

- Commercial Building National Accounts (NAs) – Commercial building owners and operators with large portfolios of buildings that regularly build new buildings and retrofit and renovate existing buildings. The National Renewable Energy Laboratory collaborates with National Account partners in pre-design, design, performance verification, and reporting phases of a process aiming to construct buildings that achieve savings of 50% or retrofit buildings that achieve 30% savings above American Society of Refrigeration and Air-Conditioning Engineers (ASHRAE)/IESNA Standard 90.1-2004. National Account partners can then deploy this knowledge through their building portfolios. In FY 2008, 23 National Account partners agreed to work with DOE. Another 50 National Accounts are planned in FY 2009.

- High-Performance Green Building Consortium – DOE-selected building industry groups that work with DOE to accelerate the commercialization of high-performance building technologies by disseminating information on new technologies within the commercial building community. A high-performance commercial building offers

improved energy, economic, and environmental performance compared to standard practice.

**Building Energy Codes and Standards**

The Department works closely with ASHRAE on its Standard 90.1 and with the International Code Council (ICC) on its International Energy Conservation Code (IECC) in response to Title III of the Energy Conservation and Production Act, as amended (42 U.S.C. 6831 et seq.).

In 2007, DOE challenged ASHRAE to upgrade Standard 90.1 to be 30% more stringent than its 2004 edition by 2010 and has been actively engaged in the ASHRAE standards process by providing technical assistance to support the upgrade of Standard 90.1. ASHRAE reports that it is on track to achieve the 30% goal.

The Department also joined many stakeholders in the IECC process to upgrade the 2006 edition of the IECC by 30% by 2012. Significant progress has been made in the 2009 edition, upgrading it by about 15%. The Department is an active participant in the codes development process by providing engineering, economic and energy analyses of improvements to the code as well as specific code proposals.

**Appliance Standards**

In the 1970s, there was a debate over whether to set energy conservation standards for consumer products, including refrigerators. Many were concerned that standards would be too expensive to meet and would lead to higher prices for consumers. The Appliance Standards Program was established with the passage of the Energy Policy and Conservation Act of 1975 (EPCA), which designated test procedures, conservation targets, and labeling requirements for certain major household appliances. The Act has been amended several times, changing the conservation targets to mandatory standards and adding many additional products to eventually include a broad range of residential and commercial products. As amended, the appliance standards requirements are among the broadest and most stringent of any country in the world. Once the standards passed, manufacturers put their engineers to work developing new products to meet and exceed the standards. Manufacturers were successful and developed new, energy efficient products that often exceeded the requirements.

For example, refrigerators cost less today than they did before DOE's ENERGY STAR®, research, and energy conservation standards programs. Yet, today's refrigerators are larger, have more features and use less than one-third as much energy as those earlier designs. DOE estimates that its programs have contributed to a decrease in refrigerator energy consumption on the order of 0.25 quads compared 1975, even though the number of refrigerators grew by 35%. This energy savings is equivalent to the amount produced by 58 coal power plants.[10]

[10] Source: 1975 to 2005 energy use – DOE refrigerator standards rulemaking data developed by Lawrence Berkeley National Laboratory; 2015 projection – EIA's *Annual Energy Outlook 2005;* number of households – Buildings Energy Data Book Table 2.1.1.

President Obama showed his interest and expectations for the Appliance Standards Program just 17 days after his inauguration. The President visited DOE and set out his expectations for the program in a memorandum to Secretary Chu requesting DOE take all necessary steps to finalize legally required energy conservation standards rulemakings as expeditiously as possible and consistent with all applicable judicial and statutory deadlines.

**Builders Challenge and DOE Residential Energy Efficiency Initiatives**

The goal of Builders Challenge is to build 220,000 new high-performance homes by 2012. These homes improve energy efficiency by at least 30% over a typical new home. To date, more than 1,000 homes have been qualified as meeting the Builders Challenge and 200 builders have agreed to build to meet the Builders Challenge in the future.

DOE efforts focus on significantly increasing energy efficiency in existing homes including promotion of improvements through home performance contracting, which entails comprehensive whole-house assessments. These efforts are implemented by utilities, state energy offices, and not-for-profits that recruit and train home improvement contractors. Qualified contractors conduct a comprehensive assessment using diagnostic equipment. Based on this assessment, contractors offer a prioritized list of solutions; they then complete the needed renovations or work closely with other participating contractors. Common improvements suggested are sealing air leaks and ductwork, adding insulation, improving the heating-cooling system, and upgrading lighting. More than 50,000 assessments and 15,000 installations have been completed since 2002.

**Buildings Efficiency and Economic Recovery**

The Department's Building Technologies Program is utilizing up to $344.3 million in Recovery Act funds to expand and accelerate the development, deployment, and use of energy efficient technologies in all major types of commercial buildings as well as new and existing homes. The activities funded are:

- Advanced Building Systems Research (up to $99.5 million) – These projects will address research focused on the systems design, integration, and control of both new and existing buildings. Buildings need to be designed, built, operated, and maintained as an integrated system in order to achieve the potential of energy efficient and eventually net zero-energy buildings. These projects will move beyond component-only driven research and address the interactions in buildings as a whole, in order to progress development of integrated, high performance buildings and achieve net zero-energy buildings.

- Residential Buildings Development and Deployment (up to $69.7 million) – Expanded work in Residential Buildings will increase homeowner energy savings by supporting energy efficient retrofits and new homes while raising consumer awareness of the

benefits of increased health, safety, and durability of energy efficiency. The projects will provide technical support to train workers and create jobs, developing a new workforce equipped to improve the Nation's homes and will permit a major initiative to provide builders with technical assistance and training through states, utilities, and existing programs to increase the market share of new homes achieving substantial whole house energy savings. To address existing homes, DOE will work with municipalities with a variety of housing types and vintages as well as subdivisions with similar housing stock to encourage a large number of energy efficiency retrofits.

- Commercial Buildings Initiative (up to $53.2 million) – These Recovery Act funds will be used to accelerate and expand partnerships with major companies that design, build, own, manage, or operate large fleets of buildings and that commit to achieving exemplary energy performance. This funding will be used to expand the number of these partnerships from 23 to about 75 through a competitive process beginning in September 2009.

- Buildings and Appliance Market Transformation (up to $72.1 million) – Key activities include preparing the design, construction, and enforcement community to implement commercial building energy codes that require a 30% improvement in energy efficiency over the 2004 code in 2010; and accelerating and expanding DOE's Appliance Standards program to evaluate innovative technologies and develop new test procedures that are more representative of today's energy use and equipment.

- Solid State Lighting Research and Development (up to $49.8 million) – The objective of the solid state lighting activities is to advance state-of-the-art solid-state lighting (SSL) technology and to move those advancements more rapidly to market through a coordinated development of advanced manufacturing techniques. This project will both aid in the development and reduce the first cost of high performance lighting products. Continuing advances can accelerate progress towards creating a U.S.-led market for high efficiency light sources that save more energy, reduce costs, and have less environmental impact than other conventional light sources.

Other Departmental activities funded by the Recovery Act also place significant focus on buildings and building energy codes, such as the Energy Efficiency and Conservation Block Grants (EECBG), Weatherization Assistance, and State Energy programs.[11] EECBG supports activities such as the enforcement of building energy codes; conducting building audits; establishing financial incentives for efficiency; and installing LEDs.

In addition, in response to Recovery Act requirements, governors advised the Secretary that they have taken actions to ensure the implementation of the 2009 IECC or equivalent for residential buildings, and Standard 90.1-2007 for commercial buildings. They must provide similar assurances that the State will implement a plan to achieve 90% compliance with their new codes by 2017. DOE is gearing up to provide technical assistance to States to implement these new codes and to implement, enforce, and evaluate compliance.

[11] See Section 410 of the American Recovery and Reinvestment Act of 2009.

**Conclusion**

The Department is committed to improving energy efficiency through innovative R&D, public outreach, and collaborative partnerships. Improved energy efficiency in buildings generally is a fast, low-risk, and economical way to reduce energy consumption and associated environmental emissions, including greenhouse gases. We look forward to working with Congress to continue to realize short-term energy and cost savings, and to contribute to the goal of achieving net-zero energy residential and commercial buildings in the future.

Thank you for the opportunity to appear before you today, and I am happy to answer any questions.

**Department of Energy**
Washington, DC 20585

September 24, 2009

The Honorable Eleanor Holmes Norton
Chair
Subcommittee on Economic Development, Public
Buildings and Emergency Management
Committee on Transportation and Infrastructure
U.S. House of Representatives
Washington, DC 20515

Dear Madam Chair:

On July 16, 2009, Dr. Drury Crawley, Commercial Building Research Team Lead, Building Technologies Program, Office of Energy Efficiency and Renewable Energy testified regarding, *"Green Buildings Offer Multiple Benefits: Cost Savings, Clean Environment and Jobs."*

Enclosed are the responses to eight questions that you submitted to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

Betty Nolan
Senior Advisor
Congressional and Intergovernmental
Affairs

Enclosures

Printed with soy ink on recycled paper

QUESTION FROM CHAIRWOMAN NORTON

Q1. Like all federal agencies I assume you have a limited budget for research. What are the promising areas for research in the energy or green fields?

A1. DOE has not conducted detailed benefits analysis at the activity level to inform decisions about which green building technologies, other than energy technologies, demonstrate the most promise; i.e., which technologies could deliver the greatest greenhouse gas benefits per Federal dollar invested. In the area of commercial building energy technologies, however, DOE's analyses demonstrate that the most promising commercial building energy efficiency areas include: efficient lighting, efficient HVAC technologies, building controls, and commercial refrigeration.

QUESTION FROM CHAIRWOMAN NORTON

Q2. Please tell us about the goals of the Building Technology Program.

A2. The long-term goal of BTP is to develop conservation technologies, practices, and designs to realize marketable, cost effective net-zero-energy residential and commercial buildings by 2020 and 2025, respectively. BTP is also developing practices and technologies to enable energy-efficiency retrofits for the more than 110 million existing residential buildings[1] and 5 million existing commercial buildings[2] in the U.S. through a combination of technology research, development of accurate and inexpensive energy-use information systems, and extensive interaction with the private retrofit market, the mortgage industry, and other key stakeholders.

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[1] Residential Energy Consumption Survey, EIA 2005, http://www.eia.doe.gov/emeu/recs/recs2005/c&e/summary/pdf/tableus1part2.pdf.

[2] Commercial Buildings Energy Consumption Survey, EIA 2003, http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set1/2003pdf/a1.pdf.

QUESTION FROM CHAIRWOMAN NORTON

Q3. How large is the residential component of your program as compared to the commercial side?

A3. The FY 2010 Budget Request for the Building Technologies Program is $237.7 million. Residential and commercial integration activities are requested at $40 million each. $92.7 million is requested for the Emerging Technologies activity, including work on solid state lighting ($19.2M), HVAC ($9.0M), thermal envelope and windows ($16.0M), solar heating and cooling ($6.5M), and analysis tools ($5.5M). Most of the emerging technologies research can apply to both residential and commercial buildings.

QUESTION FROM CHAIRWOMAN NORTON

Q4. How do you entice the private sector to be a government partner in your programs?

A4. Fortunately, many in the private sector are eager for long-term solutions to the ever-increasing costs associated with operating commercial buildings. Most of these operating costs are directly attributable to energy use. The bottom line value added of improved building energy performance, environmental compliance and stewardship, along with image enhancement, customer satisfaction, and potential employee productivity improvements are all attractive to commercial building owners and operators. The Commercial Buildings Initiative is designed to assist owners and operators to achieve their buildings related energy, environmental and business goals in concert.

The programs introduced to date—the Commercial Building Energy Alliances, the Commercial Building National Accounts, the High-Performance Green Building Partnership Consortia and Supporting Consortium—have been very well received by commercial building owners and operators. DOE solicited "leaders" in their respective sectors to help establish the alliances (Walmart in the Retail Energy Alliance, PNC in the Commercial Real Estate Energy Alliance, and Kaiser in the Hospital Energy Alliance). The involvement of these influential businesses helped to attract interest from both the media and other businesses. Others who were the first to join quickly realized the win-win in collaborating with DOE: simultaneously reducing operating costs and showing commitment to the environment.

DOE will continue to directly solicit involvement of the private sector. In addition, as the partnerships produce more tangible results, such as case studies based on real building projects with National Accounts, DOE will publicize these results in trade journals and business publications, which will in turn build additional interest.

QUESTION FROM CHAIRWOMAN NORTON

Q5. DOE received $344m in recovery funds to "expand and accelerate the development, deployment, and use of energy efficient technologies in all major types of commercial buildings." To date how is that effort going? What has DOE done with its funds?

A5. Within EERE's $16.8 billion Recovery Act appropriation, $1.25 billion was unallocated. DOE decided to dedicate up to $344.3 million of this funding to the Building Technologies Program, to be used as follows:

Advanced Building Technologies (up to $99.5 M)

- Accelerate building technology RD&D through R&D projects, via National Laboratories as well as with the private sector, to develop more efficient technologies.
- Solicitation to private sector, laboratories and universities; National Laboratory competition for directed research in FY 2010.

Residential Buildings (Building America, Builders' Challenge, and Existing Home Retrofits) (up to $69.7 M)

- Complete 15 energy efficient Municipal and Subdivision retrofit projects. These activities will strive to bring homes up to code level.
- Builders Challenge: Achieve an additional 1.5% market share by September 2010 by working with 750 builder partners who build homes 30% more energy efficient than code.
- Solicitations for:
    - Private sector (builders and A&E firms) for retrofit research teams

- Laboratories and existing contractors in October 2009 to continue research under the Building American and Builders' Challenge activities (both of which are focused on new homes)
- National laboratory for the identification and mitigation of barriers to highly efficient residential retrofits.

Commercial Buildings Initiative Acceleration (up to $53.2 M)

- Partner with major companies that design, build or operate large fleets of buildings and that commit to exemplary energy performance in selected new and existing commercial buildings.

Building and Appliance Market Transformation (up to $72.1 M)

- Expand building codes adoption and assist states in the implementation of higher level energy efficiency codes through laboratory support for upgrading building codes and developing training materials and tools for state and local officials.
- Increase the breadth and scope of Energy Star with emerging technologies and develop a more robust certification and validation process.
- Accelerate the pace and scope of Appliance Standards test procedure development.
- Improve the efficiency of commercial buildings' operations by developing training curricula through a solicitation for companies and universities to develop training materials.

- Energy Saving Performance Contract for Forrestal Building for energy efficiency upgrades.
- Energy Smart Schools and Hospitals
- Solar Decathlon

Solid State Lighting (up to $49.8M)

- Accelerate technical goals to increase the efficacy of state-of-the-art SSL to 113 lm/W of white light from a laboratory LED module by FY10.
- Four solicitations (all closed and in merit review) are being conducted (SSL Core Technologies; SSL Core Technologies Laboratory Research Call; SSL Product Development; and Manufacturing).

QUESTION FROM CHAIRWOMAN NORTON

Q6. On page 4 you mention the successful launching of a web tool design aid for Commercial Lighting. Please explain how the web site works and more importantly what is on this web site.

A6. Commercial technology solutions, like the Commercial Lighting Solutions tool, are interactive tools (primarily web-based) through which commercial building designers, engineers and operators can obtain expert holistic guidance on how to improve the efficiency of their building systems. In consultation with DOE, members of the Commercial Building Energy Alliances determine the technologies to target and work with the national laboratories to design and to create a tool which gives customizable best practices and strategies on design, controls, installation, and commissioning of a particular technology.

The Commercial Lighting Solutions (CLS) web tool, released in 2009, provides energy savings projections based on user input and selections for retail buildings. The solutions are designed to meet or exceed energy savings levels needed to qualify for tax incentives. Commercial users and designers can also use the web tool to document performance against energy goals which can support end-user applications for incentives and rebates from utilities and State or regional energy efficiency programs. In FY 2010, the Pacific Northwest National Laboratory (PNNL) plans to upgrade this tool to include additional baselines for retail and office. PNNL will also begin adding solutions for hospitals and schools. The tool can be found at: https://www.lighting-solutions.org

Solutions embodying a similar approach to CLS, but focused on the technologies of daylighting, supermarket refrigeration and packaged commercial HVAC, are planned for development in FY 2010 and deployment in FY 2011.

QUESTION FROM CHAIRWOMAN NORTON

Q7. As you suggest at the bottom of page 5, there was considerable concern that infusing energy performance into appliance performance would raise the cost of the appliance. In fact the opposite has occurred. Please explain.

A7. Since the inception of appliance standards, DOE has found that once new energy conservation standards are set, manufacturers work to develop products that meet and exceed the new standards. To date, new products have often been less expensive because manufacturers have been able to reduce costs by redesigning the more efficient product and/or its manufacturing process. In addition, in some instances, product manufacturing has been moved to less expensive areas, including outside of the U.S.

QUESTION FROM CHAIRWOMAN NORTON

Q8. On page 7 you mention the commercial buildings initiative which will used recovery funds to partner with companies that design, build, and manage large building portfolios. What is the goal of this initiative? What exactly will the funds be used for?

A8. The Net-Zero Energy Commercial Building Initiative (CBI) is the initiative that drives the Commercial Buildings Program's activities. The establishment of this initiative and its accompanying goals were authorized by Section 422 of the Energy Independence and Security Act of 2007 (EISA).

CBI's goals are as follows:

- Develop technologies and tools necessary to improve the whole-building energy performance in new construction by 50% by 2015; and by 70% by 2025, relative to ANSI/ASHRAE/IESNA Standard 90.1-2004. A 70% reduction in whole-building energy use, combined with on-site renewables, would enable the achievement of DOE's commercial net-zero energy buildings goal by 2025.

Recovery Act funds will allow the Commercial Buildings Team to address R&D gaps necessary to achieve these goals. In addition, these funds will sustain the work of the Commercial Buildings National Accounts (companies with a significant portfolio of building square footage, and that regularly construct new buildings) and the Commercial Building Energy Alliances, two public-private partnerships facilitated by DOE in this area.

**Commercial Building Energy Alliances:** These Alliances link commercial building owners and operators, by sector, who want to reduce the energy consumption, greenhouse gas emissions, and operating expenses of their buildings by using the advanced technologies, analytical tools, and capabilities emerging from DOE and the national laboratories. These informal associations function in a number of capacities, including:

- Sharing best practices, energy-use measurement, and benchmarking—in essence, serving as organic, real-time information networks;
- Using field date and feedback to identify R&D needs to guide the Federal research agenda;
- Deploying advanced technology through technology procurements and information-sharing within commercial subsectors;
- Conducting deployment, dissemination, and technical assistance activities to encourage and assist adoption of technologies, practices, and policies;
- Developing training materials and courses for building professionals and trades to be deployed by alliance partners;
- Developing and disseminating public education materials on benefits and cost-effectiveness of high-performance, energy-efficient buildings.

**Commercial Building National Accounts:** The National Accounts teams, comprised of companies and representatives from the national laboratories, are working to construct and retrofit buildings that will achieve significant, energy savings. Recovery Act funds will allow expansion of the number of companies

involved from 23 to approximately 75, and will also enable the addition of private sector A&E firms to the national laboratory teams to build capacity in the marketplace. The resulting projects—and the insight, detailed measurement, and verification that accompany them—will inform development of DOE's R&D portfolio going forward. The projects will provide operational and cost data needed to make a solid business case for investment in high-performance buildings.

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# HEARING BEFORE THE UNITED STATE HOUSE OF REPRESENTATIVES COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE SUBCOMMITTEE ON ECONOMIC DEVELOPMENT, PUBLIC BUILDINGS, AND EMERGENCY MANAGEMENT

## ENTITLED

## "GREEN BUILDINGS OFFER MULTIPLE BENEFITS: COST SAVINGS, CLEAN ENVIRONMENT AND JOBS"

WRITTEN TESTIMONY OF
JAMES L. HELSEL, JR. CCIM, CRE, SIOR, CPM
PARTNER, RSR REALTORS

ON BEHALF OF
THE NATIONAL ASSOCIATION OF REALTORS®

JULY 16, 2009

REALTOR® is a registered collective membership mark which may be used only by real estate professionals who are members of the NATIONAL ASSOCIATION OF REALTORS® and subscribe to its strict Code of Ethics.

EQUAL HOUSING OPPORTUNITY

On behalf of the 1.2 million members of the National Association of REALTORS®(NAR), thank you for the opportunity to share the Realtor community's views on the subject of today's hearing, "Green Buildings Offer Multiple Benefits: Cost Savings, Clean Environment and Jobs." Having built Washington D.C's first LEED Silver certified building, NAR is uniquely qualified to offer testimony on this important topic.

In addition to certifying a green building, NAR has taken a number of other important steps to raise public awareness about green buildings and their benefits in the marketplace. For example, NAR has:

- Developed the GREEN Designation program to offer advanced training and certification for real estate professionals. Like many professionals, continuing education classes and professional designations are a regular part of Realtors®' on-going training. The GREEN designation was developed to help Realtors gain the expertise needed to advise their clients on what to look for and consider when interested in making more eco-friendly building purchases. Launched in November of 2008, more than 3,700 Realtors® to date have taken the 12-hour core course. This is an exceptional take up rate for this type of certification program. Peer reviewed by the EPA and U.S. Green Buildings Council, the program has also been awarded with the ***2009 Award of Excellence*** by the American Society of Association Executives. (Appendix B.)

- Advanced important green building issues, including the "greening" of local MLS's and proper valuation of green buildings. By undertaking pilot programs to include data fields in the Multiple Listing Service property databases with information about real property's attributes (e.g., whether it includes Energy Star appliances), many MLS systems are responding to consumer demand for more information about building efficiency.

- Partnered with Federal agencies and others to promote green buildings. For example, NAR and the Department of Energy collaborated to provide consumers with an "Energy Savers" brochure with the facts about reducing energy use and saving money.

NAR supported the energy efficiency tax credit, block grant and weatherization assistance investments of the American Recovery and Reinvestment Act (ARRA; P.L. 111-5). ARRA also provided the General Services Administration with funding for high performance green building, to demonstrate technologies that result in learning and reduced building costs in the long term. These are all examples of voluntary, incentive-based approaches that will improve energy efficiency and are consistent with NAR policy.

**Leading by Example: The NAR Green Building**

NAR's was the first green certified building in the District of Columbia. Located blocks from the U.S. Capitol, the building was first occupied in October 2004, and was awarded a Silver LEED rating by the U.S. Green Building Council. This $47 million investment is a model to NAR's 1.2 million members of environmentally sustainable real estate development.

NAR's Real Property Operations Committee, chaired by our Treasurer Jim Helsel, oversaw development of the building. Research had shown that LEED buildings used far less energy than the national average. There was also an important opportunity to demonstrate our commitment and lead by example on energy efficiency and environmental conservation.

In the LEED process, a building must meet certain prerequisites and receive a minimum number of points for meeting certain guidelines to achieve a certification. Here is a general description of the process:

- Planning: A project team is assembled to evaluate and articulate project goals and certification level sought. Includes the owner, architect, engineer, contractor and property manager.
- Registration: Registration serves as a declaration of intent to certify a building under LEED.
- Application and documentation: The team assembles documentation for the credits it has chosen to pursue, and upload the materials to LEED Online to start the application review process.
- Submission: The project administrator formally submits the application via LEED Online.
- Application Review: For new construction, the preliminary design and construction and assembled documentation is reviewed for completeness and compliance with the rating system.
- Certification: LEED certified projects receive formal certificate of recognition.

Achievements of the NAR building include:

- *Cleaning of a Brownfield site* – The site of the building has a long history of commercial use. Most recently, an abandoned gas station had occupied the site. In order to make use of the site, contamination from leaking fuel tanks and other sources had to be removed.
- *Renewable Energy* – 50% of the building's energy comes from renewable sources (green power).
- *Use of ultra-energy efficient glass building envelope, daylighting and indoor plumbing efficiency* -- To significantly reduce energy usage, the building is designed with high efficiency HVAC systems and a high-performance glass curtain wall, which has resulted in a 30% reduction in energy use compared to ASHRAE code standards. It also includes motion sensitive lighting designed to reduce spillage of light from the site, reducing light pollution.
- *Reduced water usage* – Our building has achieved more than a 30% reduction in water usage compared with buildings of similar size. It includes a rainwater water catchment system which stores rain water that hits the roof. This water is used to irrigate plants at ground level, reduces storm water runoff as well as peak flows to municipal wastewater treatment facility.
- *High transit usage* – Locating the building near Metro rail stations and multiple city and regional bus lines has allowed us to achieve a high rate of transit usage – 75% of building occupants ride public transportation to work.

Attached to this testimony is a listing compiled from the official LEED score sheet for our building of the features for which the NAR building was awarded points.

**NAR Research Finds Significant Demand for Green Buildings**

For some time, NAR's members and the association itself has been increasingly aware of the importance of energy efficiency to property owners and buyers. NAR research has consistently shown that a) there is a considerable and growing market for green buildings and b) voluntary and incentive-based approaches will do more to spur the demand than inflexible, burdensome mandates.

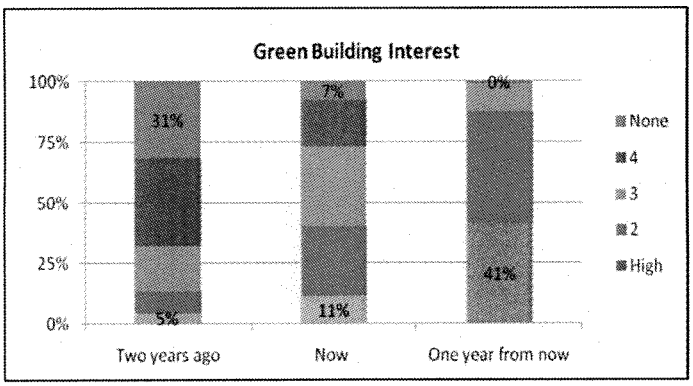
NAR research has consistently shown there is considerable market demand for energy efficient buildings. As part of the 2008 Profile of Home Buyers and Sellers, NAR asked buyers to categorize environmentally friendly features as "not important," "somewhat important" or "very important." For each feature, here is the percentage that considered it to be somewhat or very important:

- Heating and cooling costs – 89%
- Commuting costs – 80%
- Energy efficient appliances – 73%
- Efficient Use of Lighting – 70%

This research did not find any major differences in these preferences when either the income or age of the buyer, price or size of the home, or whether the home was new or previously owned was taken into consideration.

Last March, NAR sponsored in-depth public opinion research on energy efficiency by Hart Research and Public Opinion Strategies. According to this research, not surprisingly, consumers considered energy efficiency to be very important when buying a home: energy efficiency ranked third only to price and location and ahead of the attractiveness, layout, size and age of the property. Most strongly supported and preferred voluntary and incentive-based (over mandatory) approaches to energy efficiency. Also, the vast majority felt that they could use more education about energy efficiency. It should be noted, also, that consumers continued to focus on the economic benefits over the environmental, as their motivation for looking for homes with energy efficient features. Consumers indicated that they are significantly less willing to buy energy efficient homes as the upfront cost increased or where investments could not be recouped in energy savings within 5 years.

Realtors® expect the interest in energy efficiency and a trend toward green buildings only to grow in the future. In a May-2008 survey, 2,000 Realtors® rated interest in green buildings at that time versus two years earlier and one year after the survey. The percent reporting some level of interest (a rating of 1-4 out of 5) increased from 69% (2 years before) to 93% (at the time of the survey). When asked the same question about the market one year later, 100% believed there would be continued interest.




**NAR Supports Voluntary, Incentive-Based Approaches to Energy Efficiency**

As Realtors® respond to growing consumer demand for green housing, like consumers surveyed, NAR supports a voluntary, incentive-based approach to energy efficiency. We believe that such an approach would sustain and spur the trend for green buildings, and make them a more permanent feature in the real estate market. In the

view of Realtors®, **it also provides a "win-win" scenario by allowing for vigorous economic growth while** improving the environment. We note that NAR certified its green building without any encouragement or prodding by the Federal government.

The green building market is already responding to consumer demand. For example, consider this recent **headline in the Miami Herald**: "Increasing demand for energy efficient, environmentally friendly buildings is **bringing business to architects during the construction downturn."** McGraw-Hill Construction is forecasting that the combined annual commercial and residential green building markets will total $62 billion by 2010. Architects, homebuilders, remodelers, real estate agents and all the industries that rely on housing and homebuilding are responding to consumer interest in green issues. They are building and providing products that the consumer wants. And this is happening all without significant assistance (or interference) from the public sector.

The Federal government does provide important public research, capital and economic incentives, such as the current tax credit for energy efficient home improvements which spurs demand and interest. However, NAR believes that government should be limited to this role: By leading the way with green Federal buildings, providing for research that spurs innovation and most importantly, keeping the market fluid and free of mandates, the Federal government can do more to promote the public good than with red tape and mandates that will only hinder the market at a time of economic recovery.

To further spur consumer demand for green buildings, these homes must make financial sense as well as environmental sense, even though their up-front costs may be more expensive than traditional housing. This will require research, education and incentives. NAR believes that as more of these buildings are constructed, they will demonstrate their financial viability over and over again. Simply put, a home that that works well retains value. Energy efficiency comes naturally to the top of the list. Building green is an efficient way to reduce investment risk, because every decision and dollar that is made to reduce energy consumption serves as a buffer from the increasingly unstable energy market.

The recent strength and growth of green building is due in large part to its voluntary nature, because it offers flexibility that is essential for incorporating the principles of sustainable design in innovative ways to construct a home that is both environmentally sound and affordable to homebuyers.

NAR members have shown that green building is both proactive and profitable, primarily because current programs have been allowed to thrive and shift to meet specific conservation needs in a given geographic or market area. NAR supports a national green building program that is flexible and market-driven, encourages continued growth in green construction that protects options for consumers in all markets, as well as preserves, protects, and promotes the health of our environment.

For example, the energy efficiency tax credit, block grant and weatherization assistance investments of the American Recovery and Reinvestment Act (ARRA; P.L. 111-5) will encourage property owners to make improvements and save money on energy bills. ARRA funding for GSA high performance green buildings will help to demonstrate technologies that result in learning and reduced building costs in the long term. These are all examples of voluntary, incentive-based approaches that will improve energy efficiency and are consistent with NAR policy.

**Conclusion**

Again, we appreciate the opportunity to testify on green buildings and their value to the market place. We look forward to working with the subcommittee as it provides oversight in the implementation of the ARRA.

## APPENDIX A:

**NAR's Green Building: Features that achieved Silver LEED Points and Rating**

**Category: Sustainable Sites**

- Erosion & Sediment Control
- Site Selection (in already urbanized area)
- Urban Redevelopment
- Brownfield Redevelopment
- Alternative Transportation: near transit; bicycle facilities; alternative fuel recharging stations
- Design to Reduce Heat Islands: Roof
- Design to Reduce Heat Islands: Exterior landscaping
- Light Pollution Reduction

**Category: Water Efficiency**

- Water Efficient Landscaping (50% reduced water usage)
- Water Use Reduction (30% reduction)

**Category: Energy & Atmosphere**

- Building System Commissioning
- CFC Reduction in HVAC Equipment
- Optimize Energy Performance: model showed 30% reduction
- Green Power - building uses wind power

**Category: Materials & Resources**

- Storage and Collection of Recyclables
- Recycled Content (5%) in building materials
- Local/Regional Building Materials (20%)

**Category: Indoor Environmental Quality**

- Carbon Dioxide Monitoring
- Low-Emitting Materials: paints
- Low-Emitting Materials: carpet
- Indoor Chemical & Pollutant Source Control
- Thermal Comfort
- Daylight: 75% of spaces
- Views: 90% of spaces

**Category: Innovation & Design Process**

- Innovation in Design: Exceed 20% in regional building materials
- Innovation in Design: Green Housekeeping
- Innovation in Design: Educational Outreach
- Innovation in Design: 100% underground parking
- LEED Accredited Professional on development team

PLUS: While not officially a part of the LEED point system, the NAR building includes a storm water storage tank that stores rain water that hits the roof; this water is used to irrigate plants at ground level. This system reduces peak flows to municipal wastewater treatment facility.

**APPENDIX B:**
**NAR's Green Designation: Helping To Build REALTOR® Awareness And Expertise On Green Issues**

NAR and REALTORS® have responded to consumer interest in green issues by developing the Green Designation for Realtors. This designation will allow Realtors to become educated and stay current on the latest green issues and trends, such as energy efficiency, water conservation, and green building materials. More importantly, this designation will allow Realtors to educate clients and prospective purchasers on the benefits of green buildings.

Since the Designation's launch in November 2008:

- Over 3,700 students have completed the Core Course
- Nearly 2,200 students have been designated
- Students are signing up at an accelerated rate – one of the most successful designations in NAR history

Designation Benefits

- National consumer and builder awareness campaigns
- Ongoing education and support through newsletters and Webinars
- A robust-community style Web site featuring numerous resources, including but not limited to, the latest green industry news, designee directory and profile, green industry directory, and social media

Program Highlights

- NAR is actively developing partnerships with major green industry organizations such as the USGBC, NAHB, DOE, and EPA.
- NAR's Green Resource Council is helping advance important green industry issues such as advocating proper valuation of green homes and buildings.
- Green designees are helping NAR evaluate Multiple Listing Services from a "green" perspective and making suggestions on how MLSs can be greener.
- Examples of MLS Boards that have added green data entry fields to their MLSs can be viewed at http://www.greenresourcecouncil.org/greening_the_mls.cfm. This site will act as a central repository for all green MLSs across the country.

**NAR Response to Questions**

**Hearing Before House Transportation & Infrastructure**
**Subcommittee on Economic Development, Public Buildings & Emergency Management**

**Entitled "Green Buildings Offer Multiple Benefits"**

**July 16, 2009**

- Your testimony indicates that the NAR certifies green buildings. What method do you use?

**Response:** While NAR does not itself certify green buildings, our Washington D.C. office building has been LEED certified by the U.S. Green Building Council. For more information on the LEED methods, please see: https://www.gbci.org/ProjectNav.aspx?PageID=131&CMSPageID=117.

- What research do you think the federal government should engage in?

**Response:** The Federal government could help advance green buildings research. Here are critical research questions:

- Why exactly if investing in energy efficient buildings is so cost effective, is consumer demand for such investments so limited? In a 2007 study, McKinsey and Company estimated that 40% of the investment options could be achieved at "negative" cost (i.e., the savings to society would exceed the cost). Why if there is money to be saved in today's U.S. economy, would the property owners not volunteer and take full advantage of net savings?
- If the reason is insufficient financial incentives, which kinds of incentives would most effectively encourage property owners to make improvements: grants, loans, tax credits?
- To what extent is this limited market demand explained by the lack of available, affordable, and quality energy audits? In many states, the property owners must take their chances with a largely unregulated cottage industry of energy auditors who also sell home improvements or are not able to find a professional locally and must pay a premium to make the trip.

**KEVIN KAMPSCHROER**

**ACTING DIRECTOR**

**OFFICE OF FEDERAL HIGH-PERFORMANCE GREEN BUILDINGS**

**PUBLIC BUILDINGS SERVICE**

**GENERAL SERVICES ADMINISTRATION**

**BEFORE THE**

**SUBCOMMITTEE ON ECONOMIC DEVELOPMENT, PUBLIC BUILDINGS, AND EMERGENCY MANAGEMENT**

**COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE**

**U.S. HOUSE OF REPRESENTATIVES**

**JULY 16, 2009**

Good afternoon, Madam Chair, Ranking Member Diaz-Balart and members of this Subcommittee. My name is Kevin Kampschroer; I am the Acting Director of the Office of Federal High-Performance Green Buildings in the US General Services Administration (GSA). Thank you for inviting me today to discuss the benefits of green buildings on costs, the environment and jobs.

GSA, through its Public Buildings Service (PBS), is one of the largest and most diversified public real estate organizations in the world. Our inventory consists of more than 8,600 owned and leased assets with nearly 354 million square feet of rentable space across all 50 states, 6 territories and the District of Columbia. Our portfolio is composed primarily of office buildings and courthouses, land ports of entry, and warehouses. GSA's goal is to manage these assets responsibly while delivering and maintaining superior workplaces at best value to our client agencies and the American taxpayer. And we collaborate with other Federal agencies not only as our clients, but also as partners in developing, implementing and evaluating federal green building programs, for example, through such programs as ENERGY STAR, which is jointly run by the US Environmental Protection Agency and US Department of Energy.

**Cost and Value**

High-performing green buildings provide the best value for the taxpayer and for the public through both life cycle cost benefits and positive effects on human health and performance. A recent study[1] of GSA's 12 earliest green federal buildings shows energy use is down 26% and occupant satisfaction up 27%, compared to commercial office benchmark data. More importantly, the top third of studied buildings, which use an integrated design approach, deliver significantly better results with 45% less energy consumption, 53% lower maintenance costs, and 39% less water use.

A recent report by CoStar, a major real estate transaction information collection company, shows that green buildings, in general, also have lower vacancy rates. According to the 2008 McGraw-Hill Construction SmartMarket Report: Key Trends in the European and U.S. Construction Marketplace, operating costs for green buildings are on average 8 to 9% lower, building values are 7.5% higher, buildings have a 3.5% greater occupancy ratio, and green buildings provide a 6.6% total return on investment.

With the above mentioned long-term operating cost benefits, the life cycle cost of green buildings is lower than the life cycle costs of those that are not. Even the initial capital costs are not necessarily higher, and when they are, only marginally so. A 2007 study by Davis

[1] "Assessing Green Building Performance", K.M. Fowler et al., US General Services Administration 2008, based on: KM Fowler and EM Rauch: Assessing Green Building Performance: A post-occupancy evaluation of 12 GSA Buildings, PNNL-17393, Pacific Northwest National Laboratory, Richland, WA, 2008. The full report and white paper summary can be found at www.gsa.gov/appliedresearch under Research Publications.

Langdon[2] shows that green building aspects tend to have a lesser impact on costs than other building decisions, such as which kind of finishes and amenities the building might provide.

**Environmental Benefits**

Sustainable design is not just about cost. Good sustainable design offers economic, environmental and societal benefits. A planted or "green" roof, for example, can have significant economic benefits, by lowering the roof temperature and thereby reducing the amount of cooling tonnage needed, and even lowering costs for neighboring buildings. A planted roof can reduce the environmental impact of a building, by reducing pollution from the building's power usage, as well as reducing the city's heat island effect. Another environmental benefit of planted roofs is reduced storm water runoff. In cities like Washington DC, which has a combined storm water and sewer system, this reduces water pollution, both locally and downstream in Chesapeake Bay. Finally, societal benefits include physically and aesthetically pleasing effects for building occupants and neighbors, and jobs for workers to install and maintain planted roofs.

The careful use of materials can reduce energy consumption during the manufacturing process and protect the health of occupants. Careful construction techniques can reduce the amount of construction waste that reaches landfills by 95% or more. Re-use of existing structures can reduce resource consumption while preserving our country's heritage. Careful siting can make buildings perform better from both environmental and human perspectives: proximity to transportation reduces pollution and improves occupants' quality of life. The key is holistic, integrated consideration of all the factors that influence building, including consideration of the decision of whether to build at all.

There has been a lot of focus on sustainable design. For example, the Energy Policy Act of 2005 requires buildings to be designed to be 30 percent better than the current energy code. Design is important; without it we cannot achieve the country's energy goals. We need, however, to have at least as much emphasis on actual building performance. California is contemplating standard building performance labeling as a prerequisite for every real estate transaction, and beginning in 2010 GSA will require new building leases over 10,000 square feet[3] to have an Energy Star rating, earned in the most recent year of operation. The value of and Energy Star rating is that is an on-going performance measure.

We also need to expand our measures. Today we typically concentrate on energy use in the building. Buildings exist in context, though; they are parts of neighborhoods, communities and cities. They are also tools for businesses and organizations. One of the key policy

[2] Lisa Fay Mathiesson, Peter Morris, "The Cost of Green Revisited" Davis Langdon, July 2007, http://www.davislangdon.com/upload/images/publications/USA/The%20Cost%20of%20Green%20Revisited.pdf

[3] Except in cases where the tenant stays in the same building, or where the market does not provide a building that meets the agency's functional needs, ot if the lease is in a historic building. These exceptions are in the Energy Independence and Security Act of 2007, sec. 435.

changes of the Energy Independence and Security Act of 2007 was to clearly articulate that a high-performance green building must not just perform well mechanically, but must perform to improve the health and enhance the performance of the occupants.

A key broad measure of environmental impact is greenhouse gas, or GHG, emissions. Once you measure the collective effects of greenhouse gas production by an organization–with buildings as components--you can make more informed decisions and trade-offs. We need to look at the way we buy materials for the building, travel to and from the building, the way we use the building, and how the building is operating. When we look at both what the building is doing, and what is happening inside the building, we can make even better improvements than looking at the building alone. We have found, for example, that when we involve the tenants in building retrofit projects, we discover changes in their operations that can increase energy savings by as much as 50%, and also lower the tenants' cost of operations. In some cases this can actually lower the cost of renovation as well.

The Federal Government can, through its example, influence and accelerate the adoption of sustainable building practices across the country. And we can help do that through publicizing the quantitative results. GSA received $4.5 billion to modernize existing Federal buildings and begin converting GSA assets to High Performance Green Buildings as defined by EISA. The increased transparency of Recovery Act transactions, and reporting on results, are key to that influence.

**Creation of Green Jobs**

The jobs created across the design, engineering, manufacturing, construction and operations industries will bolster the "green economy." These jobs will provide practical experience in high-performance technologies, green construction and building operations.

GSA has identified over 50 different trades and professions that will participate in the accomplishment of GSA building projects. While it may seem that some aspects of construction are unaffected by new technologies, we find that virtually all are changed in some way by the application of the principles of sustainable buildings and delivery. For example, in demolition work, we take particular care to ensure that materials are reused, and recycled, and we have avoided 95% of the traditional construction waste on several of our projects. Even such work as sheet metal work — installing air ducts in buildings — is affected, because we are requiring better work quality to reduce energy losses through leaks.

Several areas are dramatically changed. Our use of integrated photovoltaic solar power systems (PV) increases manufacturing of this technology and reduces reliance on fossil fuels. Installation of PV requires special skills that are a part of the green economy. Lighting systems and controls have improved dramatically over the past 10 years. We will be replacing old lighting systems with new ones, which are based on a much better understanding of the needs of people in modern working conditions, capture more daylight,

and provide better working conditions, but use less energy. Ten years ago, we might have installed a lighting system that used 1.5 or 2 watts per square foot, but today it should be less than half that amount. We are using light-emitting diodes for lighting in certain locations; this is also an emerging technology. We are accelerating its adoption with the Recovery Act funding. Finally, building controls and advanced or "smart" meters are a key component of every project we are undertaking, consistent with EPACT 05. Smart meters provide far more sophisticated data. By using these data, connecting smart meters with building automation systems and creating operating models for the building, the resulting control system and procedures not only reduce energy through the use of smart meter data, but also provide us the means to track usage and make sure that energy savings persist.

GSA's use of Recovery Act funds to implement emerging technologies leads to the creation of green jobs in building operations. GSA has discovered that most building operators in the government and private sector complain that they are unable to find enough well-trained people to run high-performance buildings and keep them running in a high-performance mode. Buildings that are tuned up, commissioned and operating well can easily slip into poorer performance without proper maintenance. The aggregate result is a significant degradation of performance and an unnecessary increase in energy consumption. GSA is already in conversations with the Building Owners and Managers Association, with the International Facility Managers Association and others about the apparent shortage of sufficiently-trained building operators. We believe that GSA's Recovery Act projects can potentially provide jobs along this emerging career pathway.

**Conclusion**

The funds Congress has provided us through the American Recovery and Reinvestment Act are a sound investment in several respects. First, the timely obligation of these recovery funds will stimulate job growth in the green construction and real estate sectors. Second, the money will help us reduce energy consumption and improve the environmental performance of our inventory. Third, the funds, in large part, will be invested in the existing infrastructure, which will help reduce our backlog of repair and alteration needs, thus increasing the assets' value, prolonging their useful life, and ultimately further conserving our country's resources. Finally, these funds will be invested in government-owned assets for the long-term requirements of our federal customers.

Thank you again for this opportunity. All of us at GSA are excited by the contribution you have allowed us to make, and I am available to address any questions you may have.

**FACT SHEET**

SUBJECT: **APPRENTICESHIP PROGRAM INITIATIVE IN THE NATIONAL CAPITAL REGION**

BACKGROUND:

In June 2002, the National Capital Region of the U.S. General Services Administration initiated a new program encouraging prospective contractors to sponsor and establish apprenticeship programs in the major construction projects. The program is intended to increase the pool of skilled craft labor in the area, increase employment opportunities, and improve the quality of training received by apprentices. The Apprenticeship/Labor Trade program offers on-the-job training and classroom instruction to individuals seeking to develop skills in specific craft occupations such as plumbing, roofing, carpentry, masonry, electrical, welding, and HVAC. They can be sponsored by an employer, an employer association, or jointly by management and labor.

GSA is promoting the implementation of the program by including it as a source selection evaluation factor in the solicitations for all major construction projects; typically carrying a 10% weight. GSA's Requests for Proposals require submission of a written plan that specifies the trade work to be performed by entities with registered apprenticeship programs and the projected number of apprentices to be employed.

STATUS:

Under the program, NCR has had 14 construction projects in the Washington DC Metro area with apprenticeship programs. Completed projects are: NOAA Satellite Facility, New Census Bureau Headquarters Office Complex, ATF Headquarters, FDA Consolidation CDRH, FDA Consolidation North Garage, FDA Consolidation Shared Use, Eisenhower Executive Office Building, The Main State Project, FDA Consolidation Building 1, and FDA CDRH Office Building Phase III. Ongoing projects include: NFATC – National Foreign Affairs Training Center (George Shultz), Eisenhower Executive Office Building State Place, Herbert Hoover Systems Replacement Project, FDA Northeast Parking Garage, and FDA Consolidation East Access Road.

The contractors are required to submit quarterly reports on the status of the program, indicating data such as: the number of apprentices currently employed, total number of apprentices employed to date, number of verified individual apprentice agreements on file, the total number of DC resident apprentices, and the dollar amounts invested in the program to date.

As of June 30, 2009, the number of apprentices employed to date totaled 902. 116 of the apprentices are District of Columbia residents. The cumulative total of dollars invested in the program is $807,187.99.

APPRENTICESHIP/LABOR TRADE PLAN SUMMARY REPORT

ATTACHMENT B - REPORTING PERIOD ENDING 06/30/2009

| Project Name | Contractor | Contract Amount | Start Date | Project Completion Percentage | Description of Completed Work | APPRENTICES: Number of Apprentices Projected in Contractor's Proposal | Number of Apprentices Currently Employed | Total Number of Apprentices Employed to Date: | Number of Verified Individual Apprentice Agreements on file | Total No. of D.C. Resident Apprentices Employed to Date | Dollars Invested in the Program to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NFATC - National Foreign Affairs Training Center (George Schultz) | Grunley Construction Co. | $45,391,473.00 | 10/26/2007 | 79% | Building F: Roofing 90%, Fire Suspension System 99%, and Paint 96% complete. Building K: Exeterior Walls and Windows 98%, Roofing 90%, Inalling Drywall 91%, and Stairs 95% Complete | 10 | 13 | 46 | 0 | 5 | $ 25,240.90 |
| Eisenhower Executive Office Bldg. (State Place) | Grunley Construction Co. | $155,384,624.00 | 7/2/2007 | 96% | Mechanical/Electrical Rough-ins completed. Ceramic Tile Installation, Special Space #8, Temporary Auditorium, Temporary Storage Building, and Roof Repairs are in progres. | 30 | 8 | 43 | 40 | 2 | $ 378,535.75 |
| Herbert C. Hoover Building (Systems Replacement Project) | Gilbane/Grunley Joint Venture | $41,697,215.00 | 1/7/2008 | 76% | Electrical - Temporary Power & Lights and Make Safe; Mechanical - Make Safe/Cut-Cap and Stock Materical | 35 | 46 | 71 | 71 | 11 | $ 41,176.00 |
| FDA Northeast Parking Garage and Tunnel Extension | Costello Construction | $23,897,010.00 | 6/19/2008 | 97% | CIP Concrete-ground level through 6th level, in -slab conduit and grounding, sprinkler system, access road to loading dock, setting and terminating equipment, cable barrier. | one (1) apprentice for every 10 journeyman | 4 | 17 | 4 | 3 | $ 27,200.00 |
| FDA East Access Road | Total Engineering, Inc. | $19,153,612.00 | 8/8/2008 | 72.5% | Install sediment and erosion controls; construction of storm drainage system; clear grub, start earthwork operations; asphalt paving, blastwall and bridge work. | 10 | 1 | 6 | 2 | 0 | $ 12,991.34 |
| **TOTALS:** | | | | | | | **72** | **183** | **117** | **21** | **$485,143.99** |

| | |
|---|---|
| Cumulative total of apprentices employed as of period ending 03/31/2009: | 879 |
| Additional Apprentices during this quarter ending 06/30/2009: | 23 |
| Cumulative total of apprentices employed period ending 06/30/2009: | 902 |
| Cumulative number of DC resident apprentices as of period ending 03/31/2009: | 112 |
| Additional DC resident Apprentices during quarter ending 06/30/2009: | 4 |
| Cumulative number of DC resident apprentices period ending 06/30/2009: | 116 |
| Cumulative total dollars invested in the Apprentices during period ending 06/30/2009: | $ 485,143.99 |

**THE HOUSE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE, SUBCOMMITTEE ON ECONOMIC DEVELOPMENT, PUBLIC BUILDINGS AND EMERGENCY MANAGEMENT:**

***Green Buildings Offer Multiple Benefits: Cost Savings, Clean Environment, and Jobs***
**July 16, 2009**

Questions for the Record and GSA responses

**1) As you know, Congress provided the GSA with a total of $5.5B in stimulus funds. Specifically, Congress directed that $4.5B go toward converting Federal buildings to high-performance green facilities. Another $750M is available for building and renovating Federal buildings and courthouses, and $300M must be directed to renovating and constructing land ports of entry. It is my understanding that GSA will select projects based on the speed at which jobs can be created and how much energy efficiency can be gained. Is that correct? How important is energy efficiency when selecting these projects?** (Fallin)

Yes, that is correct. The speed at which jobs can be created and the project's effect on Federal building energy efficiency were principal factors that GSA applied to identify projects for Recovery Act funding. GSA identified the best projects based on two over-arching criteria: Ability of the project to put people back to work quickly, and transforming Federal buildings into high-performance green buildings. The complete list of selection criteria, in descending order of weight is:

- High-performance features, concentrating on energy conservation and renewable energy generation.
- How quickly construction could begin (e.g. creating jobs), with an emphasis on those projects that could begin within 120 days.
- Execution Risk (ensuring that the projects will not fail due to unforeseen conditions).
- Facility Condition. The Facility Condition Index is a standard real estate industry index that reflects the cost of the repair and alteration backlog of a particular building relative to the building's replacement value.
- Improving Asset Utilization, by reducing vacancy or improving the intensity of asset use.
- Return on Investment, as measured by using a project payback period calculation.
- Avoiding Lease Costs, as evaluated by the opportunity cost of leasing in a particular market.
- Historic Significance, following the guidelines resulting from the National Historic Preservation Act of 1966, as amended

**2) The Energy Independence and Security Act (EISA) of 2007 directed GSA to consider using geothermal heat pumps in new and retrofitted GSA buildings. Section 439 of that Act asked you to focus your efforts on using geothermal heat pumps to meet the energy efficiency goals. What is being done by GSA to comply with this section of the law? How are you implementing it?** (Fallin)

In compliance with Section 439 of the Energy Independence and Security Act of 2007, GSA considers using geothermal heat pumps in its new and retrofitted buildings. GSA now has four geothermal, ground source heat pump systems installed in its inventory. At the time the Energy Independence and Security Act was passed, there was one geothermal heat pump facility. This technology can significantly lower operating costs and energy consumption.

GSA is working to implement EISA Section 439. As GSA undertakes major renovations of mechanical systems, the use of geothermal heat pump technology will be evaluated in every case. This technology is particularly effective in historic buildings because it eliminates the need for the extensive restoration work involved in adding cooling towers and installing or repairing ductwork. GSA will use work already performed by the Oak Ridge National Laboratory for the Department of Defense in evaluating site conditions. Although the initial capital investment in these geothermal systems is usually much higher than conventional air-driven systems, and their applications present site limitations, these systems are lifecycle cost effective.

GSA has engaged the services of the geothermal experts at the Oak Ridge National Laboratory, through the Department of Energy, to advise us on the design submissions from firms engaged in both new construction and renovation. Our New England Region hosted an educational seminar on Earth Day for project managers at the U.S. Custom House in Portland, Maine to demonstrate the successful use of geothermal HVAC. We included seminars on geothermal applications in the national construction conference held in July 2009, and we will continue to provide information about geothermal technology to internal and external audiences.

Fourteen years have passed since the Government Accountability Office's Comptroller General's 1995 report that identified lack of understanding of the technology within the construction industry as the largest barrier to adoption. Despite our efforts and industry efforts to educate construction firms, we still encounter resistance from areas that would seem ideally suited to its use. For example, the designers proposed using geothermal heat pumps at a land port of entry in Texas, but the construction management firm said they could find no qualified installers, and that prior local installations failed due to poor construction. GSA is working to overcome barriers to implementation and improve understanding of geothermal's feasibility.

The Oklahoma State Capitol (a non-GSA building) illustrates geothermal heat pumps' benefits: lower energy consumption and operating costs, easier maintenance, increased durability, lower greenhouse gas emissions, and more effective use of real property assets. In accordance with EISA Section 439, we anticipate wider adoption of the technology, not just in GSA's inventory, but also across the entire Federal government.

**3) Can you provide the Committee with a list of all the buildings GSA has considered putting geothermal heat pump technology in, and the ones where it was ultimately selected?** (Fallin)

In compliance with Section 439 of the Energy Independence and Security Act of 2007, GSA evaluates using geothermal heat pumps in its new and retrofitted buildings. GSA has selected and installed geothermal heat pump technology at the following locations:

- U.S. Custom House in Portland, Maine
- Oroville-Osoyoos Border Crossing Station in Oroville, Washington
- U.S. Land Port of Entry in Warroad, Minnesota
- Department of Homeland Security: Citizenship and Immigration Service/ Immigration and Customs Enforcement office building in Omaha, Nebraska

Several other locations are under evaluation for geothermal heat pumps, including the Land Port of Entry in Alexandria Bay, New York and the Department of Homeland Security's headquarters at the St. Elizabeths campus in Washington, DC.

Other, non-GSA Federal buildings have also successfully implemented geothermal heat pump technology, such as the U.S. Environmental Protection Agency's Robert S. Kerr Environmental Research Center in Ada, Oklahoma.

**4) Finally, have you been in contact with the geothermal heat pump industry to get their input on implementing Section 439 of EISA 2007?** (Fallin)

Yes, GSA has been in contact with the geothermal heat pump industry for input on implementing Section 439 of the Energy Independence and Security Act of 2007 in several venues. Most recently, on July 24, 2009, Kevin Kampschroer (Acting Director of GSA's Office of Federal High-Performance Green Buildings) met with industry representatives and described several options for the industry to become more engaged in the major modernization work that is being funding through the Recovery Act. Since the meeting, there has been a continuing exchange of information and ideas. Several other meetings between GSA and the geothermal heat pump industry have been held during the past year.

**THE HOUSE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE, SUBCOMMITTEE ON ECONOMIC DEVELOPMENT, PUBLIC BUILDINGS AND EMERGENCY MANAGEMENT:**

***Green Buildings Offer Multiple Benefits: Cost Savings, Clean Environment, and Jobs***
**July 16, 2009**

Follow-up questions from hearing and GSA responses

**1) Please provide a report identifying projects and locations where apprenticeship program exist.** (Norton)

GSA's Public Buildings Service currently has an active apprenticeship program in GSA's National Capital Region (NCR).

Please see attached:

- Fact Sheet: *Apprenticeship Program Initiative in the National Capital Region*;
- *Apprenticeship/Labor Trade Plan Summary Report*; and
- *GSA Apprenticeship Policy Project Reports* for each of the five projects and locations where apprenticeship programs exist.

**2) What are the energy conservation features of the DOT building? How close is it to being LEED Certified?** (Norton)

The Department of Transportation (DOT) headquarters building's energy conservation features include:

- A planted "green roof" covering 85% of the building's total roof area – over 67,000 square feet. The green roof helps insulate the DOT building from daily and seasonal temperature fluctuations. This conserves energy, particularly in summer months.
- Variable speed heating and cooling pumping systems.
- Variable speed drive fan motors for cooling towers.
- All 100 air handling units in the project are variable speed, variable air volume systems. These systems reduce energy consumption by 15-30 percent compared to a traditional constant volume system.
- Water side economizers that process cold water such that the buildings do not have to run central water chillers during cooler seasons.
- Gas-fired boilers with diesel fuel as the backup.
- Almost exclusively fluorescent interior lighting (over 20,000 fluorescent fixtures).
- "Low-E" (low emittance of radiant energy) glass reduces the load on the heating and cooling systems by efficiently insulating windows.
- State-of-the-art building automation system (BAS) with a web interface. The automation system helps to efficiently meet differing seasonal and occupancy loads, resulting in energy savings.
- A commissioning process to optimize the building's energy performance and ensure that implementation and operation meet the systems' design intent.

A preliminary review of the LEED scorecard in July 2003 indicated that the DOT building, when completed, might score 28 out of 69 possible points, which could have earned a "LEED Certified" rating. The solicitation for offers was issued in 1999, before GSA started requiring LEED certification for its buildings. A LEED Silver rating was recommended for all new GSA construction and major modernization projects starting in 2003. LEED certification was not obtained then because of the absence of a LEED rating requirement in the original contract language.

At this time, considerable and additional costs would be requested by the developer to achieve LEED certification. If the DOT headquarters building were to seek LEED certification, LEED-EB (LEED for Existing Buildings) would be the only option, based on actual performance through building operations and maintenance.

**3) How can the federal government avoid being the largest payer under the new DC law that levies a service charge upon owners of impervious surfaces that drain into the Anacostia River?** (Norton)

In May of 2009, the District of Columbia announced that it was changing the method of calculating its charge for commercial and government properties' water output. The new formula is based on each property's impermeable horizontal surface area. GSA is still evaluating whether such a tax can legally be imposed on federal property. However, GSA has a robust program already in place to minimize surface runoff, and plans to strengthen its program even further, so that the federal government will minimize the amount that may be assessed under the new impervious surface law.

GSA's National Capital Region (NCR) already has several hundred thousand square feet of green roofs, and has developed a program for installing high absorption landscaping, including an experimental garden in a courtyard at EPA's headquarters in the Federal Triangle.

Our most comprehensive effort yet will be at the St. Elizabeth's campus, where GSA is developing the Department of Homeland Security's new 6 million square foot headquarters complex. All new buildings will have green roofs. The first major new construction, the 1.14 million square foot Coast Guard headquarters, will have a series of landscaped courtyards and other absorptive features that will capture and reuse almost all runoff from the site. The remaining runoff will be captured in a decorative holding pond at the base of the hill.

Similarly, at Southeast Federal Center, The Yards (a mixed-use development by Forest City Washington on 44 acres of federal property) will feature absorptive landscaping and porous paving, green roofs, and other features that will substantially reduce runoff.

Finally, should the tax be found to be applicable to federal property, GSA anticipates that the DC Water and Sewer Authority and the District Dept. of the Environment will develop a formula to giving credit for the federal government's stormwater management initiatives. NCR has met with city officials to discuss this. City officials have indicated that they will work on such a credit system, but that it will take them approximately two years to finalize and implement the credit system. Although officials have indicated that the first payment will not be due until October 2010, GSA is proactively minimizing surface runoff from its properties.

**4) What is the status of the report on green roofs in DC that the Appropriations bill required GSA to provide? (Norton)**

GSA recently sent out a request through FedCenter and the Interagency Sustainability Working Group, to identify agencies that lease space with planted "green roofs" in the DC Metro area willing to participate in a green roof study. Some replies have already been received, and GSA will evaluate respondents' roofs for the study.

GSA's National Capital Region, in conjunction with GSA's Central Office, has completed an inventory of the planted roofs within NCR's inventory. NCR has 26 planted roofs, totaling 765,568 square feet. GSA is researching: green roofs' installation dates (some date back to the 1930s and '40s); performance issues over their lifespan; replacement and maintenance history; and causes for replacement or maintenance. This information is necessary to determine the full scope of a study of the measurable benefits and challenges associated with green roofs.

**5) When will building operation contractors be trained how to maintain efficiency through proper maintenance? (Carnahan)**

GSA's facility operation and maintenance contractors are contractually required to have trained and qualified technicians (and certified, where relevant) to operate and maintain the equipment and systems.

When a contractor is working on an existing facility that undergoes equipment upgrades or when additional equipment and systems are added, training is required, and is provided through the construction contractor performing the upgrade or installation in accordance with the GSA Facilities Standards document.

The GSA Facilities Standards for the Public Building Service (P100) currently provides for the requisite training for new construction and modernization of GSA facilities. Some relevant sections include:

- **1.2 General Design Philosophy.** GSA requires detailed instructions from the designer stating the operational/maintenance procedures and design intent for all building systems. These instructions developed during the design phase are incorporated into the comprehensive training for operation and maintenance personnel.
- **5.16 Building Automation Systems (BAS): Level of Integration.** When planning highly integrated BAS systems, the necessary training will be required for the operating staff.
- **7.4 Commissioning.** The construction contractor must verify that training for building operating staff includes information on what to do for each mode of operation.

In July 2008, GSA issued a national Standard for Building Operations and Maintenance, which is being included in all new and renewed operations and maintenance contracts. The new Standard includes increased qualification requirements for GSA's contractors. For example, contractors are now required to use technicians certified by the InterNational Electrical Testing Association (NETA) when working on switchgear equipment.

Requirements in the Standard for Building Operations and Maintenance related to maintaining efficiency through proper maintenance include:

- **C.8.1 Minimum staffing and ability to contact and communicate with the COR.** The onsite technicians must have sufficient skills to immediately respond to a variety of service requests involving multiple trades, including the operation of building control and energy management systems.
- **C.9.2 Components of the Building Operating Plan.** GSA's operations and maintenance contractors must submit a building operation plan, which must include operating strategies to maximize efficiency and minimize energy consumption.
- **C.11. Monthly Progress Reports.** GSA's operations and maintenance contractors must submit monthly reports that: review energy performance trends

as of the end of the performance month and describe likely causes for significant changes from the same month 1 year prior, if applicable; and explain any significant deviations from established system performance standards, if applicable.

- **C.21.5 Energy Conservation.** The Contractor must operate equipment and systems as efficiently as possible without compromising service to the tenants. Failure to operate equipment prudently (e.g., unnecessarily setting demand peaks, simultaneously heating and cooling, operating equipment when not needed, overriding set point unnecessarily, or failing to correct underlying conditions) may result in deductions under the Payments clause. The Contractor must develop a Building Energy Conservation Use Plan. Where data is available, the Contractor must report monthly energy use as compared to the previous year and provide the reason for energy increase greater than 3 percent compared to the same period of the previous year. The energy use report also must identify measures to conserve energy, any operational or physical changes to the system, plant, or equipment, and optimization opportunities to reduce energy consumption or cost. The Contractor is expected to make full use of available analytical tools (e.g., interval meter data, BAS trend data) to diagnose problems and identify operational improvements.

**TESTIMONY OF**
**RAYMOND UHALDE**
**SENIOR ADVISOR TO THE SECRETARY OF LABOR**
**U.S. DEPARTMENT OF LABOR**
**BEFORE THE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE**
**SUBCOMMITTEE ON ECONOMIC DEVELOPMENT, PUBLIC BUILDINGS AND EMERGENCY MANAGEMENT**
**UNITED STATES HOUSE OF REPRESENTATIVES**

**JULY 16, 2009**

Good afternoon, Chairperson Norton and Members of the Subcommittee. Thank you for extending an invitation to speak with you about the benefits offered by the creation of green buildings and efforts to make existing buildings more energy efficient.

Supporting a green economy is a top priority at the U.S. Department of Labor. President Obama and Secretary Solis have made the creation and expansion of good green jobs a top priority and believe that green jobs will be a key driver behind America's economic revitalization and sustained economic stability. Green jobs will benefit the American worker by offering good wages, pathways to long-term career advancement, and prosperity.

At the Department of Labor, we are working to support green jobs primarily through investments in the development of quality labor market information about green jobs, investments in training and reemployment services to support the job growth in green industries, and encouraging Registered Apprenticeship in green industries, which include occupations in construction and building retrofitting.

Currently, the Department is making significant investments in the energy efficiency and renewable energy industries, which are closely related to the construction

of new commercial and residential buildings, as well as the retrofitting of existing buildings.

An initial step is the investment of $500 million provided under the American Recovery and Reinvestment Act (Recovery Act) to prepare workers to pursue careers in energy efficiency and renewable energy industries. On June 24, 2009, Secretary Solis announced five grant competitions, which will provide for research, labor exchange and job training projects. Four of the competitions are designed to serve workers in need of training through various national, state and community outlets: Energy Training Partnership Grants; Pathways Out of Poverty Grants; State Energy Sector Partnership and Training Grants; and Green Capacity Building Grants. The fifth competition is for State Labor Market Information Improvement Grants that will fund state workforce agencies to collect, analyze and disseminate labor market information and to educate individuals about careers in green industries. Through these investments, the Department is partnering with other Federal agencies to support the creation of jobs by developing a pipeline of skilled workers in the energy efficiency and renewable energy industries. Where possible, the Department's Employment and Training Administration (ETA) encourages applicants for these grants to connect their workforce development strategies to other Recovery Act funded projects that create jobs or impact the skill requirements of existing jobs.

In addition to the significant investment under the Recovery Act, ETA plans to promote training in green industries, including green construction, through its regular programs. For example, ETA is encouraging green construction through its YouthBuild program. This program helps disadvantaged youth gain high school credentials and skill

training that leads to employment, while building or rehabilitating affordable housing for low-income or homeless families in poor communities. ETA is providing YouthBuild grantees with technical assistance in green construction techniques, knowledge of, and ability to work with sustainable building products, solar panel installation, and weatherization techniques to ensure that YouthBuild participants are prepared for the green economy and high- wage careers associated with it.

The Department also plans to expand our efforts to place and encourage retention of women in apprenticeship programs in green industries through its Women in Apprenticeship and Non-Traditional Occupations Act (WANTO) program, a program jointly administered by ETA and the Department's Women's Bureau. In recent years, grants awarded under this program have focused on projects to improve the recruitment, selection, training and employment of women in the construction industry.

Further, the Department's Office of Job Corps is taking steps to incorporate green technologies in the future construction and repair of its nationwide network of Job Corps centers. Job Corps also plans to develop and implement green jobs training into the construction curricula at all centers.

The Department is also supporting green job training, skill development, and capacity building through the development of new initiatives. For example, ETA is currently proposing in its Fiscal Year 2010 budget request, the creation of a Green Jobs Innovation Fund which would utilize $50 million to help workers access green training and green career pathways. This proposed initiative would include a variety of strategies, such as: 1) enhanced pre-apprenticeship and Registered Apprenticeship programs in green industries and occupations; 2) competitive grants for Green Career Pathways

through post-secondary education and training to reach low income communities, persons with limited English proficiency, and other under-skilled youth and adults; and 3) incentives for partnerships that connect effective community-based organizations in underserved communities with the workforce system and employers to promote career advancement in green industry sectors.

The Department has undertaken several initiatives to enhance knowledge about emerging green industries. The Department of Labor's Bureau of Labor Statistics (BLS), in collaboration with other Federal agencies, is working to define "green jobs". In the Department's recently issued Solicitation of Grant Applications green jobs have been described as jobs in "energy efficiency and renewable energy industries". This description was useful for guiding our initial investments, but does not capture the full range of labor market information in this rapidly evolving area. The development of a definition of green jobs will facilitate the Department's ability to capture and provide high quality labor market information to governments, businesses, individuals and other stakeholders.

Also, the Department funded a report by the Occupational Information Network (O*NET) titled *Greening of the World of Work: Implications for O*NET-SOC and New and Emerging Occupations*. The purpose of the report was to investigate the impact of green economy activities and technologies on occupational requirements for current jobs and to identify new and emerging occupations. Green construction was one of the sectors studied. The O*NET study identified 17 occupations in this sector, such as welders and insulation workers, where the primary impact would be increased demand as a result of green investments, and notes that while "the work context may change, the tasks

themselves do not." Another 19 occupations in Green Construction were identified as ones requiring "Green Enhanced Skills," where green activities and technologies result in a significant change to the work and worker requirements of an existing occupation, such as plumbers, roofers, and sheet metal workers.

Finally, ETA has recently added green building practices to their existing Residential Construction Competency Model. Specific competencies include efficiency competencies, such as the ability to perform home energy audits, and waste management which includes the ability to identify construction materials that can be reused or recycled rather than disposed.

Research shows that green construction jobs will be well-paying jobs. The May 2008 Occupational Employment and Wage Estimates published by BLS indicate that construction and extraction occupations pay a median hourly rate of $18.24 as opposed to $15.57 for all occupations.

The labor market information provided by the Department will be crucial to the private sector as businesses adapt to the emerging green economy. It is anticipated that continued efforts in the public and private sector to reduce energy consumption and other environmental impacts within commercial and residential buildings (such as the Energy Star program sponsored by the Environmental Protection Agency and the Department of Energy) means that occupations dealing with the manufacture of retrofitting products and their installation will continue to be in demand. This increased demand for green retrofitting work coupled with the demand for green building materials is anticipated to increase the need for workers in manufacturing industries as well.

Apprenticeship programs working with industry already have begun to update their curriculum to incorporate an emphasis on green technologies, processes and materials. For example:

- Service Employees International Union has developed green building classes that cover energy usage, water conservation, green cleaning and maintenance.
- Home Builders Institute and the National Association of Home Builders (HBI/NAHB) have developed various green courses including Green Building for Building Professionals, Green Project Management and Advanced Green Building Science.
- Laborer's International Union of North America has created a comprehensive weatherization training program comprised of courses that teach the skills needed to become a weatherization technician, energy auditor or supervisor. Other courses in the program cover general construction, safety and environmental hazards, and life and employability skills.

Industry stakeholders are also working to link pre-apprenticeship and apprenticeship programs to improve both consistency and quality while establishing clear expectations for the training provider and the participant:

- The United Association of Plumbers and Pipe Fitters (UA) is an apprenticeship partner in the American Federation of Labor and Congress of Industrial Organization's new Emerald Cities Initiative that seeks to launch comprehensive building energy efficiency initiatives in urban centers across the country. Helmets to Hard-hats as well as UA's Veterans in Piping

- HBI/NAHB is developing green interim credentials for both its pre-apprenticeship and apprenticeship programs.

To encourage these types of efforts, ETA is conducting a grant competition to fund the development and implementation of apprenticeship standards. These grants will support the expansion of apprenticeship programs in high-growth fields, including green industries.

The Department is coordinating many of its efforts with Federal partners to ensure that investments are strategically targeted and that waste is minimized. One such effort is Labor's partnership with the Department of Housing and Urban Development (HUD) to bring job training and employment opportunities to public housing residents. Through this new partnership, residents of public housing will be able to more easily find training programs and sustainable employment in the green job sectors created by the Recovery Act. In addition, Secretary Solis and Energy Secretary Steven Chu have been working together to properly leverage Recovery Act investments and to coordinate their efforts to ensure that workers hired for new jobs in weatherization receive proper training.

During a recent visit to job training sites for youth and veterans in California, Secretary Solis visited the Department of Labor's Federal regional office in San Francisco, which is located in one of the greenest Federal buildings in the nation.

Secretary Solis believes that it is important that the Department lead by example and has begun initial talks with the General Services Administration (GSA) to help green our Federal buildings. The Recovery Act provides $4.5 billion to GSA to convert Federal

buildings into high performing green buildings, including $3 million for Registered Apprenticeship and pre-apprenticeship programs in construction, repair and alteration of Federal Buildings. The Department is working collaboratively with GSA to support these apprenticeship and pre-apprenticeship programs. Investing in energy efficient upgrades to Federal buildings around the country will create jobs while substantially reducing American energy use and cut the Federal government consumption.

In conclusion, Department of Labor will continue to work with green building stakeholders at all levels, public and private, to ensure that the economic and environmental benefits of green jobs are widely shared. The Department is pleased to be able to participate in today's hearing, and is available to assist the Committee in any way it can as it continues to examine this issue. This concludes my prepared remarks, and I would be pleased to answer any questions you may have.

## DOL ANNOUNCES GREEN JOBS GRANTS – $5 MILLION AVAILABLE FOR GREEN CAPACITY BUILDING

The American Recovery and Reinvestment Act of 2009 (The Recovery Act) was signed into law by President Barack Obama on February 17, 2009. The Recovery Act designates $500 million for projects that prepare workers for careers in the energy efficiency and renewable energy sectors described in Section 171(e)(1)(B) of the Workforce Investment Act (WIA). The purpose of these grants, which fund both green job training and research projects, is to teach workers the skills required in these emerging energy efficiency and renewable energy sectors. These efforts will lead program participants to job placement while leveraging other Recovery Act investments intended to create jobs and promote economic growth.

On Wednesday, June 24, 2009 the Department of Labor's Employment and Training Administration (DOL ETA) published a Notice of Availability of Funds and Solicitation for Grant Applications for **Green Capacity Building**. A summary of the Solicitation for Grant Applications for **Green Capacity Building Grants** follows.

**Background and Strategic Vision**

- The DOL ETA will promote economic recovery by supporting the training needs of workers and employers in high growth and emerging industries and assist individuals impacted by the recession by providing training and placement into employment, including the transition of auto and auto-related workers to jobs in the green energy sector.
- Grants offer an opportunity to demonstrate how partnerships between the public workforce system and other public and private systems, including labor-management partnerships, education institutions, community and faith-based organizations and research institutions can meet the workforce needs of the energy efficiency and renewable energy sectors.
- Successful organizations and partnerships will ensure that supportive services are integrated with education and training programs so that individuals can have access to a comprehensive array of supportive options. These organizations and partnerships will assist individuals in entering career pathways leading to economic self-sufficiency.
- Efforts will lead program participants to job placement while leveraging other Recovery Act investments intended to create jobs and promote economic growth.

**Green Capacity Building Grants**

- **Purpose:** This SGA supports capacity building for organizations to provide training for entry-level positions leading to career pathways and/or additional training in the energy efficiency and renewable energy industries described in Section 171 (e)(1)(B) of the Workforce Investment Act of 1998 (WIA). Funds are available for projects that build the capacity of DOL-funded training programs to ensure that targeted groups are prepared to meet the needs of our country's expanding green industries. Only active DOL-funded grantees specified in Part III of this SGA are eligible to apply.

- **Funding Available:** The Green Capacity Building Grants contains approximately $5 million in grant funds authorized by the Recovery Act.

- **Eligible Applicants:** Eligible applicants are limited to the following DOL grantees who received funding through the SGA number indicated in the parentheses: Indian and Native American Program

(SGA/DFA PY 07-04), National Farmworker Jobs Program (NFJP) (SGA/DFA PY 06-04), Prisoner Re-Entry Initiative (PRI) (SGA/DFA PY 08-03 & SGA/DFA PY 07-05), Senior Community Service Employment Program (SCSEP) (SGA/DFA PY 07-02 & SGA/DFA PY 05-06), Women in Apprenticeship and Non-Traditional Occupations (WANTO) (SGA/DFA PY 07-08 & SGA/DFA PY 06-01), Advancing Registered Apprenticeship into the 21st Century: Collaborating for Success (SGA/DFA PY 08-11), YouthBuild (SGA/DFA PY 08-07 & SGA/DFA PY 06-08), and Young Offender Grants (SGA/DFA PY 08-09, SGA/DFA PY 06-10, & SGA/DFA PY 06-14).

- **Grant Amounts**: DOL ETA intends to fund between 50 and 100 grants ranging from approximately $50,000 to $100,000.

- **Deadline**: The closing date for receipt of applications under this announcement is August 5, 2009. Applications must be received no later than 4 p.m. (Eastern Time).

- **Green Industries and Occupations:** Grantees will implement research and training programs that will help prepare individuals for careers in any of the seven energy efficiency and renewable energy industries defined in Section 171(e)(1)(B)(ii) of the WIA, which include: the energy-efficient building, construction, and retrofit industries; the renewable electric power industry; the energy efficient and advanced drive train vehicle industry; the biofuels industry; the deconstruction and materials use industries; the energy efficiency assessment industry serving residential, commercial, or industrial sectors; and manufacturers that produce sustainable products using environmentally sustainable processes and materials.

  Additionally, DOL ETA is interested in applicants contributing to our understanding of green industries and jobs that clean and enhance our environment. Applicants may propose strategies that focus on training or labor market information and exchange related to those occupations from among the following industries: transportation; green construction; environmental protection; sustainable agriculture including healthy food production; forestry; and recycling and waste reduction.

  Section 203(b)(2) of the Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 595, defines "renewable energy" as "electric energy generated from solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project." "Energy efficiency" can be broadly defined as programs aimed at mitigating the use of energy, reducing harmful emissions, and decreasing overall energy consumption.

- **Working with Other Recovery Act Programs**: DOL is partnering with other federal agencies to support the creation of jobs by developing a pipeline of skilled workers in the energy efficiency and renewable energy industries. Where possible, ETA encourages applicants to connect their workforce development strategies to other Recovery Act funded projects that create jobs or impact the skill requirements of existing jobs. ETA recommends that applicants review other parts of the Recovery Act, with a focus on the activities funded through the Department of Energy (Energy), the Environmental Protection Agency (EPA), the Department of Housing and Urban Development (HUD), the Department of Transportation (DOT), the Department of Education (Education) and others.

U.S. Department of Labor

Assistant Secretary for
Employment and Training
Washington, D.C. 20210

The Honorable Eleanor Holmes Norton
Chairwoman
House Transportation and Infrastructure
Subcommittee on Economic Development,
Public Buildings and Emergency Management
585 Ford House Office Building
Washington, DC 20515

Dear Chairwoman Norton:

Enclosed is the response to questions for the record following the testimony of Department of Labor Senior Advisor Mr. Ray Uhalde. Mr. Uhalde testimony before the House Transportation and Infrastructure Subcommittee on Economic Development, Public Buildings and Emergency Management hearing on July 16, 2009, was entitled "Green Buildings Offer Multiple Benefits: Costs Savings, Clean Environment, and Jobs."

Since the hearing date in July, Mr. Uhalde has left his position at the Department of Labor. I apologize for the delay in submitting our response and thank you for your questions. Please contact Laura MacDonald in the Office of Congressional and Intergovernmental Affairs at 202-693-4600 with any questions.

Sincerely,

Jane Oates
Assistant Secretary

Enclosure

**Questions for the Record**

**House Subcommittee on Economic Development, Public Buildings and Emergency Management hearing: "Green Buildings Offer Multiple Benefits: Costs Savings, Clean Environment, and Jobs"**

**July 16, 2009**

**Congresswoman Norton**

**Question 1(a) What is the purpose of the newly created Green Jobs Innovation Fund?**

The purpose of the proposed Green Jobs Innovation Fund is to award competitive grants to projects that help workers receive job training in green industries and access green career pathways. If funded as proposed in the Administration's FY 2010 budget, the initiative will complement and extend the competitive grant awards made through the funding available for training in high growth and emerging industry sectors under the American Reinvestment and Recovery Act of 2009 (Recovery Act).

The Employment and Training Administration (ETA) is considering several strategies to help workers access green training and green career pathways, including:

(1) Enhanced pre-apprenticeship and Registered Apprenticeship programs. This program would recognize and expand green pre-apprenticeship programs and link these programs to Registered Apprenticeships, community college curricula, and other qualified training programs. The pre-apprenticeships would target underrepresented and disadvantaged populations.

(2) Green Career Pathways. Through competitive grant awards, the Department would support post-secondary education and training partnerships that offer green career pathway programs to low-income communities, persons with limited English proficiency, and under-skilled individuals.

(3) Incentivizing innovative partnerships. Through the use of competitive grants, the Department would incentivize innovative partnerships that connect community-based organizations in underserved communities, the workforce system, and employers to promote career advancement opportunities in green industry sectors and occupations. The grants would provide training in green job skills to targeted populations, including individuals with limited English proficiency, disconnected youth, high school drop-outs, and people with disabilities. This training will help ensure that disadvantaged populations are better connected to One-Stop services, including on the job training,

Registered Apprenticeship programs, post-secondary level training, and integrated "earning and learning" models.

**Question 1(b): I noticed in your testimony that some funds are directed toward "pre-apprentice" programs. What pre-apprentice programs currently exist and how will these funds enhance those programs?**

Generally speaking, a pre-apprenticeship program is designed to impart basic skills that might help an individual to be selected by an apprenticeship program sponsor for participation in a registered apprenticeship program. They also can introduce the basics of a skilled occupation to someone with little or no experience in that specific occupational area. Although individual programs vary, many provide core industry skill training including tool identification, industry math/science, industry specific training such a blueprint reading and safety; soft skills such as work readiness; and supportive services.

There are a variety of definitions and approaches for "pre-apprenticeship" program. Similarly, there is no single structured approach to "certify" that any particular pre-apprenticeship program helps individuals meet the entrance requirements for a registered apprenticeship program. The Department will use a portion of the Green Jobs Innovation funds to certify pre-apprenticeship programs and link these programs to Registered Apprenticeships, community colleges, and other qualified occupational training programs. The aim is to encourage agreements between pre-apprenticeship programs and Registered Apprenticeship program sponsors to facilitate the "transfer" of pre-apprenticeship learning and work experience into "credit" towards the completion of a Registered Apprenticeship program -- similar to articulation agreements used between Registered Apprenticeship programs and institutions of higher learning. The Department anticipates that a more structured approach to certified pre-apprenticeship programs, which will be developed in consultation with our stakeholders, will result in greater access to Registered Apprenticeship programs for under-represented and disadvantaged populations.

Additionally, a portion of Green Jobs Innovation funds may be used to help develop occupationally specific pre-apprenticeship curricula by national labor organizations, labor-management organizations, employer associations, and employers that sponsor Registered Apprenticeship programs. Funds also could potentially be used to conduct education and outreach on certified pre-apprenticeship programs with Registered Apprenticeship program sponsors, community colleges, workforce investment boards, and other qualified training providers.

Below are some best practices and promising models among pre-apprenticeship programs, based on a scan of almost 50 programs in the construction industry:

**Indiana:** Indiana's Major Opportunities Program is a collaboration among the Associated Builders and Contractors, Ivy Tech Community College system and the State Department of Workforce Development that targets Indiana residents, particularly minorities, with pre-apprenticeship training. The program combines 100 hours of classroom experience with hands-on work experience. The program was instituted in part by the Indiana Union Construction Diversity Initiative to promote diversity and access to over 4,000 contractors across the state of Indiana.

**Illinois:** Chicago Women in the Trades (CWIT)'s pre-apprenticeship training program, Technical Opportunities Program, has a placement rate of 70 percent. Combined with statewide partnerships between career and technical colleges, community colleges, building trades, workforce investment boards (WIBs) and other industry stakeholders, CWIT coordinates the support network necessary to retain workers in apprenticeship programs, thus capitalizing on training investments.

**Maryland:** The Chesapeake, Maryland Independent Electrical Contractors (IEC) partnered with Anne Arundel Community College in administering a two week (80-hour) training course that targets existing workers who lack the skills required to become electricians. This program qualifies graduates to enter the electrical apprenticeship program with IEC and upon completion become electricians. Students will receive training in the basic electrical requirements such as tool comprehension and utilization, basic math skills, understanding electrical terms, material identification and use.

**New Jersey:** Since 2001, the Newark/Essex Construction Careers Consortium Pre-Apprenticeship Training Program has conducted pre-apprenticeship training for low-income workers with multiple barriers to higher wage employment. A recent evaluation by Rutgers University's John J. Heldrich Center for Workforce Development concluded that the combined rigor of the program's curriculum with strong union, employer and community partnerships produced significant outcomes including placement of over half the program participants into apprenticeships and raising the income of every program participant.[1]

**Ohio:** The Apprenticeship Skills Achievement Program (ASAP) in Cleveland is administered by the Construction Industry Partnership, a labor-management association which provides direct-entry for pre-apprenticeship training graduates into many labor/management registered apprenticeship programs. ASAP's program highlights a

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[1] Dr. Bill Mabe, Rutgers University's John J. Heldrich Center for Workforce Development, "An Evaluation of the Newark/Essex Construction Careers Consortium Pre-Apprenticeship Training Program", 2007.

successful collaborative effort between their pre-apprenticeship training program and the Cuyahoga County Child Support Enforcement Agency which helps program graduates structure a revised payment plan and recover drivers licenses that were revoked due to non-payment of child support.

**Pennsylvania:** The Community College of Allegheny's pre-apprenticeship training program works collaboratively with 23 labor/management apprenticeship programs in the construction industry. While each registered apprenticeship program does not provide direct entry for pre-apprenticeship training graduates, because there is collaboration with the community college program staff, the potential for more successful outcomes exists with placement and retention.

**Washington State:** Working Wheels in King County is administered by Port Jobs, a nonprofit which runs a pre-apprenticeship training program and links low-income participants to the ability to purchase cars through low interest rate car loans. A recent study by Port Jobs demonstrated that this support mechanism increased both pre-apprenticeship trainees' ability to stay on the job and long-term earning power.[2] Currently over twenty pre-apprenticeship training programs serve King County residents alone.

**Question 2: On page 6 [of your testimony] you mention 3 apprentice programs that are being updated to incorporate green technologies and materials. Please describe these programs and do you know of any other apprentice programs in the pipeline that are updating their curriculums?**

The three organizations referenced in the testimony are Service Employees International Union (SEIU), Laborer's International Union of North America (LIUNA), and Home Builders Institute and the National Association of Home Building (HBI/NAHB).

SEIU is ramping up its efforts to up-skill its existing membership in a number of sectors. Examples of green-oriented SEIU training enhancements in the public services and property services sectors include:

- Green Buildings classes that cover energy usage, water conservation, green cleaning and maintenance, and a variety of other topics;
- Incorporation of green principles and concepts into existing training;
- A Green Building Initiative designed to train 1,000 green building superintendents; and

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[2] *Gaining Traction: How Working Wheels Helps Working Families Move Ahead*, Port Jobs, 2006.

- Worker training focused on energy efficient/sustainable operations and maintenance in commercial buildings and schools.

LIUNA represents 500,000 workers in various fields including construction, hazardous waste remediation, state and municipal government, postal service, health care, maintenance, and food service. Examples of green-oriented LIUNA training enhancements include:

- An "Intro to Green" course tailored to meet leadership and workforce needs;
- A comprehensive residential weatherization training program;
- Updates to existing curriculum in erosion control, demolition, environmental remediation and landscaping/irrigation;
- New courses in solar, green roofing and water collection systems; and
- Continuous upgrading of all training modules as new green technologies are introduced

Examples of green-oriented HBI/NAHB training enhancements include:

- Green interim credentials (in development) for apprenticeship and pre-apprenticeship programs;
- Green vocational designations and certifications;
- Green training materials and text books at all levels of home construction for a variety of courses and programs including HBI/NAHB's Pre-Apprenticeship Certificate Training (PACT) curriculum as well as materials for its Residential Construction Academy for semi-skilled and skilled workers;
- Superintendent (RCS) designation;
- Green courses such as Green Building for Building Professionals, Green Project Management and Advanced Green Building Science;
- The integration of nationally recognized green standards and green building principles into approved apprenticeship and training programs;
- Increased utilization of interim credentials; and
- The adoption of a competency-based approach to apprenticeship training

ETA has funded a scan of apprenticeship organizations and programs, and obtained a baseline understanding of how key Registered Apprenticeship program sponsors and other industries and organizations engaged in workforce training are preparing to meet the demands of the green economy. ETA has learned that many of these organizations are updating their curricula and training, including:

- Associated Builders and Contractors
- The National Joint Apprenticeship Training Committee, a partnership of the National Electrical Contractors Association and the International Brotherhood of Electrical Workers
- International Electrical Contractors

- The International Union of Operating Engineers
- The National Institute for Metal Working Skills
- Seafarers International Union
- The United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada
- United Brotherhood of Carpenters
- The Utility Workers Union of American

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