Good morning, Chairman Boxer, Ranking Minority Member Inhoff and Members of the Committee. My name is David Winstead and I am the Commissioner of the Public Buildings Service in the U.S. General Services Administration (GSA). Thank you for inviting me here today to discuss GSA's activities to reduce Government building operating costs through efficiency and innovation. Today, I will concentrate my remarks on the areas that affect energy consumption. I will start with a synopsis of things we have done, discuss the new work we are undertaking, and finish with a couple of ideas that may aid this Committee, or others, in addressing this important issue. But first, I must thank the Committee and staff for the consideration and accommodation in drafting proposed legislation about lighting and energy conservation. We believe that working together, the bill as it now stands is achievable and provides GSA an opportunity—which we welcome—to demonstrate practical ways that the government can improve operations, save energy, and improve the work environment. I also understand that the Chair of the Council on Environmental Quality has submitted a letter to the Committee; I have read the draft of that letter and concur with the support it expresses for this proposed bill. We recognize that buildings in this country consume about 40 percent of the total energy used in the United States and as much as 70 percent of the electricity. GSA has an opportunity—and a responsibility —to lead by example and to demonstrate how we can reduce energy consumption by intelligently integrating energy efficiency in building design and still create places where people can work effectively.

PAST ENERGY CONSERVATION EFFORTS

GSA has always made significant investments in energy saving solutions. In fact, between 1985 and 2005, GSA achieved a 30% reduction in energy consumption. Our utility costs are consistently lower than those in the private sector. In 2006, GSA reduced the overall energy consumption of its Federal inventory by 4.7 percent compared to 2003 in response to the goals set in the Energy Policy Act of 2005. We achieved this reduction by direct investment in energy and water conservation opportunities coupled with the concerted efforts of our property managers working together with our tenants.

Lighting

Nearly 30% of the energy used in buildings is for lighting and office equipment.

During the early 1990s, GSA extensively retrofitted existing building lighting systems—this was the “low hanging fruit”—by changing from T-12 lamps with magnetic ballasts to T-8 lamps with electronic ballasts, coupled with motion sensors and new combinations of reflectors and prismatic lenses. In fact, GSA met its early energy reduction goals of 10% between 1985 and 2000 primarily through these retrofits. Since then, GSA has moved towards a combination of alternative and direct financing of a new generation of integrated lighting controls. While these are initially more costly and more technologically challenging, they provide greater energy savings in the long run. Interestingly, many projects were done in conjunction with GSA's Chlorofluorocarbon (CFC) chiller replacement initiative. As

we replaced old chillers that used ozone-depleting CFCs, we sought to reduce the size of the new chillers by reducing the heat created by the older, less efficient lighting systems.

It is interesting to note that today there is nearly 400 times as much artificial lighting in buildings than there was a century ago—and research is showing that the standards of even ten (10) years ago put more light than we need in offices.

As we move toward the future, GSA is incorporating numerous lighting initiatives in our workplaces that take advantage of sophisticated strategies, such as daylight harvesting, and commercial products that differentiate between task specific and ambient lighting requirements.

The Alfred A. Arraj U.S. Courthouse in Denver is an excellent example of how a variety of sustainable design strategies can work together for energy and lighting efficiency. The public corridors of the building are oriented to the southeast to maximize solar exposure. Oversized windows provide visitors with a connection to the outdoors and magnificent views of downtown Denver. High efficiency triple-glazed windows minimize the need for heating and cooling. Internal light shelves bounce daylight onto light-colored surfaces so that it is then reflected deep into the interior. Even the light-colored limestone floors contribute to the daylighting. Fluted glass panels bring diffused daylight into the interior courtrooms and other spaces. Overall, natural light is available throughout 75% of the building.

Our regional offices in Atlanta and San Francisco are piloting several types of advanced energy efficient lighting systems for offices:

(1) "Intelligent Lighting" using light ballasts that can be individually controlled by each person's computer, and are tied into advanced controls that monitor activity

(2) Task-Ambient Lighting for Low Ceilings

(3) Fixture retrofit that provides individual light control and that does not require re-wiring

By demonstrating and testing these new technologies, GSA gathers the information necessary to select the strategy appropriate for the different building conditions in its diverse inventory. For instance, intelligent lighting is initially more expensive and more complex, but offers an unprecedented energy savings, while task/ambient lighting for low ceilings provides an energy effective solution for a lower budget and is simpler to install and maintain.

Major challenges to future improvements in lighting efficiency are the old suspended ceilings. At this point, newer, high efficiency fixtures do not fit in old suspended ceilings. In the meantime, we are working with our customers to find ways to reduce our energy consumption. This can be as simple as remembering to turn off the lights!

Renewable Energy

GSA is one of the nation-wide leaders in the purchase and use of renewable power. We also consider opportunities for solar and other renewable energy in our building design and retrofit programs. In 2006, 4.5% of our electricity was generated from renewable power or bought through renewable energy certificates, compared with the national average of 2.3%. And, as the cost for electricity and natural gas has increased, we have found more opportunities to buy renewable power at competitive prices.

Over the last four years, GSA has purchased a total of 949,984 Mega Watt Hours (MWH) of energy from renewable sources through competitive power contracts and through the use of green power programs offered by local distribution companies.

- The Binghamton Federal Building in New York State is the first Federal facility in the nation powered by 100% renewable energy. The power flows from a new wind turbine installed at the Fenner Wind Farm in the town of Fenner, New York. This project not only demonstrated GSA's commitment to energy independence and environmental stewardship but also helped to spur economic growth of a new industry in a small community economy.

- GSA awarded a contract to supply the National Park Service's Statue of Liberty and Ellis Island with electricity generated from 100% wind resources.

The three-year contract will supply approximately 28 million kilowatt hours of renewable energy to the two landmark sites. The Statue of Liberty is not only a beacon of freedom to the rest of the world, but also a welcome sign of the future in renewable energy.

In Fiscal Year 2006, GSA received an estimated 3,285 Million British Thermal Units (MMBtu) in energy from self-generated renewable projects. We estimate that:

- 543.7 Megawatt Hours (MWH) of the total came from GSA's 12 Solar Photovoltaic installations,
- 600 million btus came from GSA's two solar thermal projects, and
- 830 million btus came from the one completed geothermal project.

In Fiscal Year 2006, GSA funded two new photovoltaic (PV) systems: The first is a 40 kilowatt array at the Trenton Courthouse Annex. The 2nd is a 300 kilowatt Building-Integrated PV system at the National Archives and Records Administration (NARA) facility in Waltham, Massachusetts (near Boston). The NARA facility demonstrates a completely integrated roof and solar system—the solar panels are the roof. The flexible, flat panel photovoltaic array is heat-welded into the roofing material and qualifies as a "Cool Roof" under the U.S. Environmental Protection Agency's EnergyStar program. The project is estimated to save approximately $204,000 and 5,550 million btus annually.

Just this year, we funded a project at the Denver Federal Center (DFC) that will provide 1 megawatt solar photovoltaic facility on 6.5 acres. The array will save $65,000 per year in electrical charges while generating $340,000 per year in revenue through the sale of renewable energy credits. The energy obtained from the solar park will be fed directly into the electrical grid and used at the DFC.

ON-GOING OPERATIONS

GSA actively manages its buildings. We currently operate our buildings at costs 5% below private sector comparable buildings, and for utilities we pay 12% less. Some of this lower cost is directly attributable to the investments the Congress authorized and GSA executed in energy conservation projects over the past 15 years.

Competitive Energy Procurements –GSA's energy experts develop procurement strategies for natural gas, electricity and green power to achieve the best competitive price, taking into account the facility's organizational goals—which may include budget stability, energy reliability and security. We provide this service to all Federal agencies—it is part of our mission.

Public Utilities – To negotiate the best rates, GSA awards large public utility area wide contracts for electricity, natural gas, steam, chilled water, and water and sewage services that are regulated by public utility commissions, utility cooperatives or municipal utility companies. In many cases, these contracts allow

for demand side management services, which include alternative financing for energy projects. In addition, GSA provides leadership in developing contracting vehicles, allowing end-users to meet multiple Federal energy requirements in both public law and executive orders.

Energy Tracking – We track energy consumption monthly at every GSA facility. Our system provides the status of energy trends as they relate to past or future building actions.

Energy Audits – GSA continuously conducts energy audits and retro-commissioning studies of its inventory to identify life-cycle cost effective energy conservation measures. Approximately 10% of our space inventory is audited in any given year.

New Directions

GSA is piloting a new chiller efficiency monitoring and analysis tool in 14 buildings with 34 plant chillers of varying sizes. If successful this operational tool will:

- Serve as a specific indicator of problems in chiller plant equipment and operations.
- Improve the efficiency and extend the life of existing chillers and related equipment.
- Provide optimal cost effective and efficient remedial action to repair, replace, and enhance chiller plant operations
- Provide energy savings, lower carbon emissions

- Reduce future capital expenses
- Reduce equipment down time resulting in reliable service to customers

We are working with one of our large customers to integrate power controls into their IT operations—establishing a monitoring system that will reduce the electricity consumed by computers when people forget to power down as they leave—no work gets lost, but substantial electricity is saved. And speaking of computers, our customers can help us dramatically reduce the energy they consume by replacing old TV-like monitors with flat screens. Flat screen (LCD) monitors use only one-third the amount of electricity as the old TV monitors, are better for the worker—less eye strain—and produce less heat that we have to dissipate with air conditioning.

FUTURE

The President has challenged all Federal agencies in his recent Executive Order 13423 to reduce our energy consumption, to increase the use of renewable energy and continue to find new technologies. We will continue to use existing energy reduction measures, but we are also researching new technologies that can help us reduce energy consumption and reduce overall costs to the Government.

Currently, GSA is increasing its participation in load curtailment and demand management programs sanctioned by utility companies and/or system grid operators to further refine its lighting use. As energy use generally peaks in the late afternoon for a short period of time, we try to quickly reduce the major

consumer of electricity in our buildings: lights. We are looking at sophisticated lighting systems that reduce illumination levels significantly enough to reduce total building demand and still leave enough light for building occupants to perform their work. In addition, GSA is strategically issuing competitive electricity contracts in deregulated markets with contract language that optimizes our demand limiting capability, thus resulting in lower rates.

As I speak, we are changing our design guidance to reflect the new legislative and Executive Order requirements. I should point out, even without these revisions, our current version sets high standards for lighting efficiency. This does not, however, diminish the need for major improvements. For example, our latest standard—not published yet—is to design for interior lighting at or below 0.9 watts per square foot. In the 1970s, a typical installation would have been as much as seven times as high, typically between 4 and 7 watts per square foot.

Newer, more efficient lighting systems not only allow us to reduce energy used for lighting, it also reduces the amount of heat produced by the lights themselves. In turn, this will reduce the air conditioning needed to cool a building, reduce the size of the mechanical system and result in even greater energy savings. Although a simple concept to understand, this approach demands an integrated, whole building approach using recognized sustainable design principles. To help us

measure how well we are achieving an integrated, whole building approach, GSA uses the LEED (Leadership in Energy and Environmental Design) rating system in the design of New Construction and Major Alteration projects.

GSA has incorporated the sustainable design practice of Green (planted) roofs in some of our projects. These roofs range from small tray systems to entire garden roofs. In Suitland, Maryland, we have built one of the largest green roofs in the country, covering 170,000 square feet—nearly four acres. Green roofs reduce energy costs by insulating the building and they also serve to reduce the "heat island" effect that is produced by large buildings in urban areas. Green roofs are also beneficial because they capture rainwater, which serves to reduce water runoff into our sewer drains and in this area, into the Chesapeake Bay.

In San Francisco, GSA is constructing a remarkable new Federal building that minimizes its energy consumption by taking advantage of favorable local conditions. This building is designed to self-ventilate its occupants through a rather simple movement of airflow not from air handling and cooling coils units but natural ventilation. That is a great example of avoiding energy use. In the tower, there is no air conditioning. The design of this building takes advantage of, and is very sensitive, to the low humidity and moderate temperatures of the Bay area. Simply put, its design is a good fit with its location.

The Energy Policy Act directs us to install advanced metering. We will be doing that over the next few years, dependent on funding. We started installing advanced meters in the Washington DC and New York areas even before the law required us to do so. In the long run, advanced meters will save money by allowing us to manage power consumption more strategically. For example, GSA was able to contribute to the electrical management in the Washington area last summer by "shedding load" – sometimes allowing buildings to get a little warmer and more humid in the late afternoon – and thus, we helped avert major brown-outs in this area. Perhaps more importantly, advanced metering will help us buy power at better prices, because we will know our use patterns in a way we just do not today.

Combined heat and power (CHP) systems can also be a source of both energy security and savings. The Food and Drug Administration Office in White Oak, Md. is a great case study. Using an energy savings performance contract (ESPC) to install a 5.8 megawatt CHP facility as part of the first phase of the campus build-out, we saved more than 37 million kilowatt-hours, $1.4 million in energy costs and $2.1 million in annual operation and maintenance costs (FY 2003 data). The plant provides reliable, uninterrupted on-site electric generation capability for three facilities on campus—a laboratory, office building and multi-use facility. Heat is recovered from the generating process to produce hot water for building use and in the absorption process to produce chilled water for air conditioning. The thermal efficiency of the plant is increased by 30% while significantly reducing pollution

emissions. Furthermore, we plan to expand this system to support 100% power generation for the entire campus once the campus is complete. This will reduce the 25 megawatt load that the local utility would otherwise have to accommodate.

FUNDING

Some of the best opportunities for dramatic energy conservation are in building modernizations. This requires capital but we can realize significant pay-back. A couple of examples:

U.S. Department of Energy Federal Energy and Water Management Award recognized GSA's work on the Charles E. Bennett Federal Building in Jacksonville, Fla., for its holistic redesign effort. Post-renovation building energy consumption dropped more than 60%. Usage was reduced by 23,781 thousand million btus, which is enough energy to power 208 homes for one year.

The John J. Duncan Federal Building in Knoxville, Tenn., successfully attained an Energy Star rating of 94 and qualified for LEED certification. Through the execution of a comprehensive building re-commissioning and installation of a new building control system, along with lighting upgrades and motion sensors, this resulted in savings of approximately 1.7 billion btus in FY 2005, exceeding FY 2005 energy reduction goals by 33%. The restrooms were also retrofitted with water-saving equipment, and new secondary meters were placed on water supplies to reduce water sewage and runoff charges, saving 400,000 gallons of water on a yearly basis.

In GAO's testimony in 2003, they noted that the backlog of repair and alteration needs in GSA-controlled Federal buildings had a direct impact on the energy efficiency of the buildings, including aging and inefficient plumbing, heating, ventilation, and air conditioning systems

In recent years, GSA has been requesting—and Congress has been appropriating—about $30 million annually for energy retrofit projects in addition to what is included in building modernization and new construction project budgets or funded by Energy Savings Performance Contracts (ESPCs). We anticipate that the higher conservation goals will increase that amount, and welcome the opportunity to discuss that matter in the course of future years' budget submissions.

It might be helpful if there were some flexibility in capital projects (the ones for which we submit prospectuses) for GSA to incorporate energy savings technology that was not included in the design at the time the prospectus was submitted.

We also understand that for some renewable energy, wind power in particular, if the Government were able to purchase power for a longer period than the current statutory limit of ten (10) years, it might be possible to both obtain very good prices for the Government, and provide the financial security that would spur the development of new sources of renewable power.

Conclusion

Thank you for the opportunity to talk about GSA's leadership role in this area. I look forward to working with the Committee on this matter of vital interest to our country.