

STATEMENT OF
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GREEN BUILDINGS
OFFICE OF GOVERNMENTWIDE POLICY
U.S. GENERAL SERVICES ADMINISTRATION
BEFORE THE
SUBCOMMITTEE ON GOVERNMENT MANAGEMENT,
ORGANIZATION, AND PROCUREMENT
COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM
U.S. HOUSE OF REPRESENTATIVES
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Good morning, Chairwoman Watson, Ranking Member Bilbray and members of this Subcommittee. My name is Kevin Kampschroer and I am the Director of the Office of Federal High-Performance Green Buildings (OFHPGB) at the United States General Services Administration (GSA). Thank you for inviting me today to discuss the progress and challenges of green building practices in the Federal Government.

Congress created the OFHPGB to enable and enhance Federal leadership in the field of large scale sustainable real property portfolio management and operations. Chartered in December 2007 under Section 436 of the Energy Independence and Security Act (EISA), the office combines authoritative knowledge of Federal processes with multidisciplinary expertise in high-performance green buildings to provide leadership within GSA, the Federal Government, and the broader commercial property market to ensure that our buildings minimize their burden on both the environment and the taxpayer. The office is housed within GSA, which provides 362 million rentable square feet of work space and is one of the largest and most diversified public real estate organizations in the world.

Since initiating operations, OFHPGB has moved aggressively and resourcefully to fulfill its mandate. Even before the funding provided through the Recovery Act, the office began planning innovative programs to coordinate Federal high-performance buildings activities, accelerate technology commercialization, and foster adoption of sustainable practices at all the lifecycle stages of Federal assets.

A principal duty of the OFHPGB is to ensure full coordination of high-performance green building information and activities within GSA. Under the Recovery Act, GSA received \$5.55 billion to be re-invested in the Federal buildings portfolio on an accelerated basis. GSA leveraged its specialized expertise in sustainability and procurement practices to support investment of these funds, consistent with the intent of the Recovery Act, to create jobs, develop high performing green buildings, and support the President's and Congress's vision for a clean energy future. GSA is committed to an integrated focus on the whole lifecycle of Federal buildings, to ensure that, by investing carefully in the best technologies and practices, we provide significant savings and value to the taxpayer over the full life of our buildings.

Greening GSA Recovery Act Projects

In the months immediately following passage of the Recovery Act, OFHPGB engaged directly with GSA's Public Buildings Service (PBS) to support Recovery Act procurements. Principal contributions by the office included establishment of Minimum Performance Criteria to guide the scoping and execution of Recovery Act projects to transform Federal buildings into *high-performance green buildings*.

Compared to average buildings, high-performance green buildings use less energy, water, and material resources; have better indoor environmental quality; reduce air and water pollution, and produce less waste; use environmentally preferable products; have integrated systems; use sites well and use local transportation to reduce adverse impacts on the local community; and improve conditions for the health and productivity of the buildings' occupants.

Among projects identified as appropriate for Recovery Act funding, GSA examined opportunities to improve the performance of projects already designed, with a focus on building systems, human performance, renewable energy generation and water conservation. GSA prioritized buildings with the worst performance in energy and poor physical conditions, and the best plans for improvement. The following improvements were incorporated into all projects, where possible, based on funding and return on investment:

1. Building tune-up (re-commissioning, controls improvements, minor systems repairs and equipment replacement)
2. Lighting (day lighting control and occupancy sensors; control systems replacement and re-wiring)
3. HVAC retrofit/replacement
4. Renewable energy generation by photovoltaic, thermal solar or wind
5. Water conservation projects

In addition, GSA has worked to establish geothermal and lighting technology acceleration programs.

An example of a GSA project taking full advantage of these greening opportunities is the modernization of the Edith Green/Wendell Wyatt Federal Building in Portland, OR to attain the US Green Buildings Council's (USGBC's) Leadership in Energy and Environmental Design (LEED)¹ Platinum rating – the highest LEED rating available. Using highly advanced design features, the finished structure will consume about 60 percent of the energy of a typical office building. It will incorporate an exceptional 18-story façade that integrates shading and reflective devices optimized for each direction of the building's location, orientation, and local climate. Compared to conventional high-rise buildings, the facility will use 65 percent less potable water.

GSA's Green Proving Ground

GSA is leveraging our Recovery Act investments to turn our large, varied and stable inventory of buildings into a proving ground for green building technologies, materials, and operating regimes. By adopting new ideas and

¹ LEED is a nationally recognized system for rating the design, construction, and operation of high-performance buildings. Buildings can attain four levels of certification: Certified, Silver, Gold, and Platinum.

products, then evaluating and publicizing our results, GSA is working to become one of the commercial real estate industry's "go to" sources for data on the environmental and economic payback of new systems and procedures. Our investments in innovative technologies and alternative energy solutions can help lead the transformation to new green jobs and green industries. Table 1 below identifies the number of green technologies we are including in our projects.

GSA is also pursuing projects that will upgrade the performance of specific systems within many of our buildings. These "Limited Scope" projects focus on improving energy performance and are evaluated in the context of the existing physical condition of the building. We evaluated these buildings and identified opportunities to "tune-up" the systems, improve building mechanical system controls, recommission building systems and retrofit or replace lighting or HVAC systems. To better achieve the goals of EISA, we particularly focused on those projects related to renewable energy production and water conservation.

In addition to the Limited Scope projects, PBS has obligated over \$110 million for High-Performance Green Building Small Projects that represent other opportunities for implementing measures to convert our buildings to high-performance green buildings. These projects tend to be smaller in scope and size.

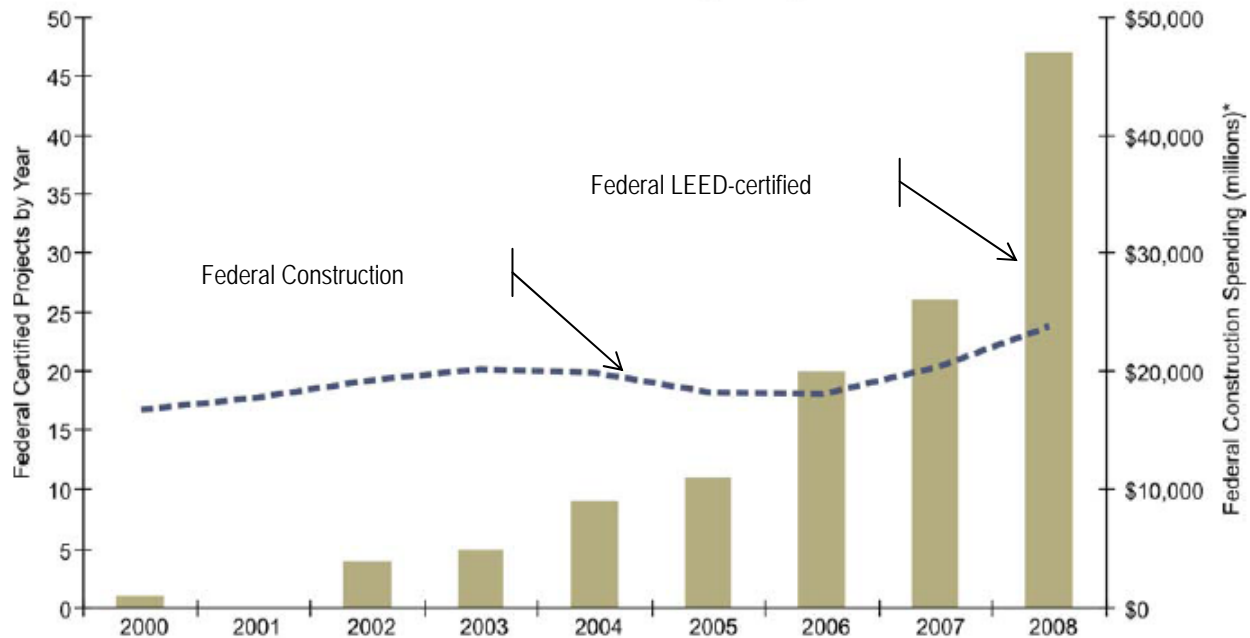
Incorporation of green building standards and practices

GSA has worked to support and apply the most effective green building rating systems and standards. Drawing from objective analysis performed by the Pacific Northwest National Laboratory (PNNL), GSA identified LEED as the most effective rating standard for the Federal real property inventory to attain, with a focus on the New Construction (LEED-NC) system and a minimum rating of Silver. The PNNL study, *Sustainable Building Rating Systems* (2006), screened more than 30 sustainable building rating systems and conducted in-depth analysis on 5 of the highest priority candidates. Based on the analysis, GSA selected the LEED rating system because it provides:

- The ability to be relevant to the scale and complexity of Federal buildings;
- Stability over time, such that evaluation of a building's performance is not subject to dramatic changes;
- Objective measures of sustainable design, verified by third parties;
- Wide availability, with broad practitioner awareness.

GSA formally conveyed this finding to the Department of Energy (DOE) in April 2008. DOE officials subsequently issued draft regulations that are currently

Figure 1: Federal LEED Certified Projects by Year



Source: Interagency Sustainability Working Group, based on US Census Bureau Statistics

undergoing review. GSA will evaluate sustainable building rating systems again in 2011 and may elect to provide additional guidance on this designation and its application.

GSA already requires that a LEED rating of Silver or better be part of the design criteria for all GSA new construction and major renovation projects; the agency currently has 48 LEED-certified owned and leased buildings with approximately 150 more working towards accreditation. Eighteen of these projects have exceeded the minimum with LEED Gold certifications, and one GSA lease, the FBI Regional Office in Chicago, has achieved a Platinum LEED rating for Existing Buildings.

As Figure 1 indicates, the number of LEED-certified projects across all Federal agencies has increased substantially in recent years. According to the USGBC, the Federal Government currently has 241 LEED certified projects with another 3,373 pursuing certification. At least 14 Federal agencies have policies to promote the use of LEED in their buildings.

EPA's ENERGY STAR® system is also used by GSA and other Federal agencies to track and improve building energy efficiency – GSA currently has over 130 buildings with an ENERGY STAR® Buildings label. EISA Section 435 requires

that all new Federal leases, with a few exceptions, must be with ENERGY STAR® labeled buildings.

In addition, GSA has supported and participated in the 3-year development process for the recently-published American National Standards Institute (ANSI)/American Society for Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE)/USGBC/Illuminating Engineering Society (IES) Standard for the Design of High-Performance Green Buildings (ASHRAE 189.1). The standard provides a code-enforceable “total building sustainability package” to enable Federal buildings to comply with Federal green building requirements.

Measuring Federal green building performance

A 2008 study² of GSA’s 12 earliest green federal buildings shows energy consumption down 26% and occupant satisfaction up 27%, compared to commercial office benchmark data in those regions. 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. We are now working to expand this analysis to cover more of GSA’s green buildings.

As you will hear from our colleagues at DOE, DOE’s Federal Energy Management Program collects extensive data on Federal energy and water use. GSA tracks these data closely for our buildings.

Since FY 2003, GSA has reduced its energy intensity by 14.3 percent in our public buildings and those leases where GSA is responsible for making utility payments. GSA has reduced its total annual energy consumption over the period FY 2003 to FY 2009 by nearly 878 billion BTUs, and is well ahead of its energy intensity reduction target of 12 percent by FY 2009. (These figures include “credits” for the purchase of renewable energy from energy suppliers.) GSA has also been actively working with the U.S. Environmental Protection Agency (EPA) to tailor *Portfolio Manager* – EPA’s interactive energy management tool for tracking and assessing energy and water consumption across an entire portfolio of buildings in a secure online environment – for Federal uses. GSA has been working with EPA to add functionality to Portfolio Manager to include other building aspects besides energy and water consumption so that Federal agencies may use it to meet all the requirements of Executive Order (EO) 13514.

² “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 <http://www.gsa.gov/appliedresearch> under Research Publications.

GSA also tracks environmentally preferable purchasing in compliance with Federal mandates. For example, in 2009, GSA spent over \$2.3 million on recycled content products, and our national janitorial contracts now require the use of green cleaning products.

There are a number of major challenges related to measuring green building performance outcomes. A key issue is increasing the number of advanced or “smart” meters in Federal buildings tracking energy and water usage. GSA, as an active member of the Office of Science and Technology Policy’s (OSTP) subcommittee on Buildings Technology Research and Development (BTRD), is supporting that committee’s project to study metering issues and technology and how metering may be expanded.

Beyond the use of resources like energy, water and to some extent, materials and waste, other environmental and health impacts are frequently more difficult to track. Indoor environmental quality (IEQ) is particularly difficult to track and measure, since it involves such a wide variety of pollutants – chemical, biological, gaseous and particulate – as well as atmospheric conditions including ventilation, lighting, acoustics, daylighting and views, all of which interact and can impact occupants’ health and productivity in many ways. Research to develop user-friendly IEQ metrics is, therefore, needed.

Other environmental aspects of buildings for which better metrics are needed include stormwater impacts of construction, lifecycle assessment of materials and products, and the impacts of siting on transportation and other community dynamics.

Federal Financial, Budgetary and Marketplace Issues

High-performance 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. 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.

Indeed, the life cycle costs of well designed and maintained green buildings are usually lower than the life cycle costs of conventional buildings. Even the initial capital costs are not necessarily higher, and when they are, only marginally so. GSA’s study of the initial capital cost shows that the increase on average is about 3 percent, ranging from zero to ten percent, depending on the design. Similarly, a private sector study by Davis Langdon³ in 2007 shows that green building

³ 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>

features tend to have a lesser impact on costs than other building decisions, such as which kind of finishes and amenities the building might provide.

Currently, Federal capital budgeting processes do not adequately take into account the life cycle cost savings of high performance green buildings, even when upfront costs are higher. High-performance buildings can deliver additional benefits that are harder but not impossible to monetize, such as carbon emissions reductions, improved resiliency to energy market disruptions, and higher worker productivity. GSA has sought to make incremental improvements to existing lifecycle costing methodologies in order to better meet the needs of energy-related investments. Specifically, GSA has initiated preliminary discussions with the National Institute of Standards and Technology Office of Applied Economics to update the lifecycle cost methodology to take into account an EISA-mandated increase in the time period for lifecycle costing from 25 to 40 years. This change would provide a longer window for energy projects to pay back their first costs, thereby increasing the scope of viable projects.

The Federal Government's ability to invest in the projects with the greatest environmental benefits would also be advanced if the authority of agencies to make contracts for renewable energy were extended from the current 10 years to 20 years.

Another marketplace challenge is the lack of skilled labor to put green building technologies and practices into effect in new construction, renovation, operations and maintenance. Significant worker training and retraining will be needed to meet the green building goals of EISA and EO 13514.

Interagency Coordination

GSA has a long history of working cooperatively and effectively with our Federal partners on these issues. Consistent with its EISA charter, GSA has dedicated significant resources and expertise to a variety of interagency green buildings initiatives. GSA coordinates much of its interagency agenda through existing Federal interagency bodies – such as the Interagency Sustainability Working Group, which GSA has just begun to co-chair with DOE's Federal Energy Management Program, and the OSTP subcommittee on Buildings Technology Research and Development (BTRD). In addition, GSA participated in the creation of the DOE's Commercial Real Estate Energy Alliance.

OFHPGB is taking a leading role in GSA's compliance with and implementation of Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance .

- The office has participated in the testing of GHG accounting protocols and submitted reduction targets to CEQ for GSA's Scope I⁴ and Scope II⁵

⁴ Scope I emissions are those that come directly from sources owned or controlled by the Federal agency

⁵ Scope II emissions are those that result from the generation of electricity, heat, or steam controlled by the Federal agency

emissions. The Office has already written guidelines on GHG accounting in Federal sector customer–landlord situations and developed internal accounting protocols for Scope III⁶ emissions.

- GSA has also laid a foundation for agencies to build their internal capacity to meet the mandates of the EO by developing teams to train and assist other agencies in the development of their GHG reduction targets and abatement plans.
- GSA is assisting CEQ to implement the EO by developing simplified reporting requirements, metrics, and tools.
- GSA sponsored a symposium with the Federal Facilities Council, DOE, ASHRAE and the International Facility Management Association on the challenges related to the “net zero” carbon design goal. The proceedings provide a blueprint for agencies to use in meeting the already aggressive targets related to the reduction of the use of fossil fuel-generated energy, which have been accelerated by the EO.
- GSA also was the lead coordinating agency for the development of two sets of recommendations to CEQ required by EO 13514: “Recommendations for Federal Local Transportation Logistics” (Section 11) and “Recommendations for Vendor and Contractor Emissions” (Section 13). GSA is a designated collaborator on three other sections: “Recommendations for Greenhouse Gas Accounting and Reporting” (Section 9), “Recommendations for Sustainable Locations for Federal Facilities” (Section 10), and “Guidance for Federal Fleet Management” (Section 12).

Environmental and Health Benefits of High Performance Green Building

Buildings have countless impacts on the environment, the economy, natural resources and occupant health and productivity extending far beyond the building footprint. Buildings use almost 40% of all energy, emit nearly 40% of carbon dioxide emissions, use 13% of our freshwater resources, generate over two-thirds of all non-industrial secondary materials, and form an indoor environment where Americans spend 90% of their time, subject to higher levels of pollution than in the outdoor environment.⁷

Effective green building design, operations and maintenance offer economic, environmental and societal benefits. If a building decreases its energy

⁶ Scope III are emissions associated with the products and services Federal agencies procure from third parties

⁷ US Environmental Protection Agency, Buildings and their Impact on the Environment: A Statistical Summary, Revised April 22, 2009, <http://epa.gov/greenbuilding/pubs/gbstats.pdf>

consumption, the cost of operation is less, the asset value increases, and the production of greenhouse gases decreases. Building water use, wastewater generation and stormwater runoff affect the quality of our water bodies, the public water supply, and the need to build expensive new water infrastructure.

The careful selection and 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 more⁸.

EISA states that a high-performance green building must not just perform well mechanically, but perform to improve the health and enhance the performance of the occupants.⁹ Indoor air frequently has levels of air pollution 2-5 times, and sometimes as much as 100 times, higher than outdoor air, and poor indoor air quality can increase respiratory diseases and even the risk of cancer.¹⁰ Lighting quality, including levels of daylighting and views, have significant impacts on employee productivity and satisfaction, as the PNNL has found. Carnegie Mellon University has documented over 100 scientifically valid studies that demonstrate the link between high-performance features and various aspects of productivity.

Some key green building approaches have multiple benefits. For example, a planted or “green” roof can lower roof temperatures, and thus cooling costs, while reducing the urban heat island effect and storm water runoff, absorbing some air pollutants and providing wildlife habitat. In cities like Washington DC, with a combined storm water and sewer system, this reduces water pollution both locally and downstream in the Chesapeake Bay.

We need to put at least as much emphasis on actual building performance, based on regular operations and maintenance, as on design, as several state and local governments are beginning to require.

Conclusion

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.

⁸ Examples of this level of waste recovery in the U.S. Department of Energy's High Performance Buildings Database include Heifer International Headquarters, <http://eere.buildinggreen.com/materials.cfm?ProjectID=781>, and Yorktown Bachelor's Enlisted Quarters: <http://eere.buildinggreen.com/materials.cfm?ProjectID=85>.

⁹ EISA Sec. 401(13).

¹⁰ US Environmental Protection Agency, Indoor Environments Division, <http://www.epa.gov/iaq/voc.html>