



**TESTIMONY OF STEPHEN T. AYERS, AIA
ACTING ARCHITECT OF THE CAPITOL**

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**BEFORE THE
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
U.S. HOUSE OF REPRESENTATIVES**

**REGARDING THE ADMINISTRATION RESPONSES TO CLIMATE CHANGE
AND ENERGY INDEPENDENCE**

MAY 11, 2007

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Mister Chairman, Congressman Mica, members of the Committee, thank you for inviting me here today to discuss the initiatives and projects the Office of the Architect of the Capitol (AOC) has undertaken over the past several years to conserve energy across the Capitol complex.

We appreciate the Congressional leadership's commitment to reduce energy consumption and conserve natural resources, reduce costs, and protect the environment. Our individual actions can add up to a tremendous collective effort and can produce significant results in saving taxpayer dollars and conserving our natural resources.

Demonstrating our commitment to energy conservation, the AOC is complying with the requirements and goals of the Energy Policy Act of 2005. Under the Act, the AOC was required to reduce energy consumption in FY 2006 by two percent, as compared to the baseline set in FY 2003. The long-term requirement of the Energy Policy Act is to increasingly reduce, by percentage, energy consumption per gross square foot per year in fiscal years 2006 through 2015. I am pleased to report that the AOC exceeded the goal of two percent by reducing its energy consumption by 6.5 percent in FY 2006.

This decrease was achieved despite the addition of 1.3 million square feet of new space or new construction to the Capitol complex including the Capitol Visitor Center, the National Garden, and the National Audiovisual Conservation Center.

We exceeded our goal through a variety of projects and pilot programs.

The AOC:

- Installed modern, energy-efficient lighting and comfort-control systems that are saving taxpayers more than \$2.2 million per year.
- Initiated a pilot program in the House Office Buildings to install dimmable lighting ballasts in the stairwells that dim when unoccupied and increase output to 100 percent when someone enters the stairwell.
- Implemented pilot program to install dimmable lighting ballast systems with daylight and occupancy sensors in overhead lighting to maintain consistent lighting levels in Senate offices. A similar pilot is ongoing in the Capitol Building.
- Is replacing conventional incandescent light bulbs with compact fluorescent lamps (CFLs).
- Is installing occupancy sensor light switches for offices, conference rooms, and Committee rooms upon request.
- Is installing restroom fixture motion sensors and low-flow devices for water conservation.
- Upgraded elevators and escalators with energy-efficient solid state equipment.
- Initiated a feasibility study to replace the Rayburn House Office Building roof with a building integrated photovoltaic roofing system or a vegetative roof for decreased storm water run-off and improved insulation.
- Is installing modern heating/cooling systems and is replacing old, inefficient windows with airtight, insulated ones in buildings across the Capitol complex, including the Supreme Court and the Ford House Office Building.
- Installed a storm water management rain garden at First and D Streets in 2004. Not only does the rain garden beautify the area near the parking lot, it helps protect and clean the environment by filtering pollutants from rain water and the air. Bioretention areas provide natural filtration to keep pollutants from running off parking lots into local streams and rivers.
- Is purchasing and leasing only Energy Star™ appliances and equipment.
- Implemented pilot program to upgrade controls on heating, ventilating and air conditioning (HVAC) terminal units in Senate offices and Committee room to reduce energy usage while increasing comfort levels.
- Implemented policy requiring the purchase or leasing of alternate fuel vehicles.

- Is completing the West Refrigeration Plant Expansion project which includes the installation of more efficient chillers and other energy-saving systems.
- Is auditing the energy consumption of facilities to identify energy saving opportunities and planning to add new steam and chilled water meters to all buildings to monitor actual energy use.
- Incorporated standards from the Leadership in Energy and Environmental Design (LEED) Green Building Rating System into our design standards to start new construction from a “green” baseline.
- Is using Energy Savings Performance Contracting to increase building energy efficiencies and upgrade infrastructure.
- Contracted with GSA and Pepco for three percent renewable energy in FY 2007 and is currently in discussions with Pepco as we assess the budget implications to increase this percentage to the maximum percentage that is reasonable.
- Is planting 175 new trees on Capitol Grounds.
- Recycled nearly 2,300 tons of paper from the House and Senate Office Buildings in FY 2006.

In addition, the AOC has taken other measures to reduce the Capitol’s impact on the environment. For example, we completed a strategy study with Carnegie Mellon’s Center for Building Performance and Diagnostics to identify projects, techniques, and policies which can be implemented in the short-term.

The AOC also implemented a procurement policy that establishes our preference for the use of bio-based products. We require the use of USDA-approved bio-based products with certain exceptions with regard to products that are unreasonably expensive, do not meet specifications, or can not be delivered in a timely manner. As additional products are approved by the USDA, the AOC will evaluate them and approve them for use in accordance with our policy. The AOC is also taking the initiative to identify environmentally-friendly products in our daily operations by adding requirements for environmentally-friendly products to our contracts.

Reducing energy consumption is another important component of our overall energy-savings campaign. To encourage end-users to reduce energy use, the AOC has been conducting a public

education campaign by providing materials on how to save energy to Congressional, Committee, and AOC offices.

Active participation by Congressional and other offices in the recycling program has been significant to its success the past several years. In both the House and Senate Office Buildings, offices are outfitted with recycling bins under the AOC's recycling program. Over the past five years, the total tonnage of non-contaminated recyclable wastes has tripled, while revenue from AOC's recycling program is up over 60 percent. In addition, over the past two years, we have recycled 100 percent of all AOC computer and electronic waste which includes monitors, keyboards, computers, printers, laptops, and other types of computer hardware.

The AOC also has initiated two Energy Saving Performance Contracts (ESPCs) and we plan to utilize more to achieve a portion of the required energy reductions under the EPAct. Our goal is to utilize the ESPC process in all of the major buildings on the Capitol campus. ESPCs allow the AOC to initiate energy saving projects with little upfront government funding. An Energy Savings Contractor (ESCO) identifies improvements with short-term payback periods. The AOC and the ESCO then select projects to perform under terms of an ESPC. A negotiated portion of the savings generated by the project pays the ESCO in accordance with the terms of the ESPC. Once the negotiated term of the contract is over, the government retains the energy savings of the project.

To ensure that our efforts save energy and save taxpayer dollars, we are planning to conduct additional energy audits. The Government Accountability Office, in its report entitled, "Energy Audits are Key to Strategy for Reducing Greenhouse Gas Emissions" validates that energy audits are a key "because these audits identify cost-effective systemwide energy-efficiency and renewable-energy projects."

To date, five energy audits have been performed. The goal is to perform energy audits on all buildings on a five-year rotating schedule. Funding was requested in FY 2007 to continue these audits, but it was not awarded as a result of the continuing resolution. We have requested \$1.1 million in our FY 2008 budget request to fund energy audits as part of our five-year plan.

In addition to the energy audits, we have completed studies to identify projects, techniques, and policies which can be implemented in the short term to save energy quickly. For example, we have been evaluating the viability of changing the Capitol Power Plant to cogeneration, which could provide steam, supplementary electricity, and backup power to the Capitol complex and reduce emissions by more efficiently capturing the energy output.

One of our more long-term strategies involves addressing many of the strategic policies and on-going planning and design opportunities that lie ahead for reducing the environmental footprint of the Capitol complex. As part of the development of our Capitol Complex Master Plan, we have been studying ways to introduce, enhance, and expand the sustainable design and operation of the Capitol complex. We are crafting a Sustainability Framework Plan which would provide a holistic approach to reducing the environmental footprint of the Capitol complex, reduce energy and water consumption, and improve air and water quality.

As I mentioned earlier, the AOC was able to achieve a 6.5 percent decrease in energy consumption in FY 2006 despite the added energy load of additional facilities to the Capitol complex. It is important to note that the largest, single contributor to our energy reduction efforts was the Capitol Power Plant. Between FY 2003 and FY 2006, the Capitol Power Plant (CPP) cut its electricity consumption by six percent and fuel energy consumption by 12.3 percent as a result of new and improved energy efficiency measures implemented there.

In addition to reducing facility energy intensity, the AOC achieved a reduction in energy-related carbon emissions since FY 2003. This is largely due to a shift in the fuel mix used at the CPP. However, switching fuels resulted in a substantial increase in energy costs due to the overall increase in fuel oil prices.

Mister Chairman, because the Capitol Power Plant (CPP) plays a critical role in our efforts, I would like to provide a brief history of the facility. The Capitol Power Plant operates 24 hours per day, 365 days per year to provide steam and chilled water service. Since the first initiation of steam service in 1910, the Capitol Power Plant has never been offline.

When it was first placed in operation, the CPP provided the Capitol complex with refrigeration and electricity. However, in 1952, the electrical generation plant was decommissioned and modern steam and refrigeration plants were built to provide buildings with steam and chilled water for heating and cooling purposes. Today, the CPP generates steam and chilled water used for heating and cooling of 23 buildings located on Capitol Hill. The electricity used today throughout the Capitol complex is purchased from Pepco. The steam plant contains seven boilers that utilize a combination of three fuels (low-sulfur coal, natural gas, and fuel oil) to generate steam. Fuel selection is made based on a combination of economics and equipment availability. The refrigeration plant contains 13 electric driven mechanical chillers that utilize refrigerant to produce chilled water used for cooling purposes.

The Capitol Power Plant operates under the Title V permitting program established under the 1990 Clean Air Act Amendments. The Title V program requires all new and existing major sources of air emissions to obtain a federally approved, state-administered operating permit. All Title V operating permits include applicable requirements from federal and state emission standards. We take great pride in abiding by the permit because the permit is designed to protect the public.

The Title V operating permit currently held by the Capitol Power Plant is administered through the District of Columbia Department of Health, Air Quality Division. In addition, the CPP is required to certify the emissions monitoring systems quarterly, with a certification performed by an independent third party testing firm annually. The Capitol Power Plant must submit quarterly reports to the District of Columbia and Semi-Annual reports to the Director of EPA Region III.

The AOC has spent and will continue to expend the funds needed to improve efficiencies and reduce emissions at the CPP. Several initiatives have been completed over the past several years to expand environmental controls at the Capitol Power Plant. A few of these projects include:

- Baghouses were added in the 1990's to reduce the amount of particulate matter emitted from boilers.
- New Continuous Emissions Monitoring System (CEMS) and Continuous Opacity Monitoring System (COMS) were installed to monitor emissions levels and maintain compliance as set forth in Federal and local regulations.

- New filter-bags in the baghouses to lower emissions of particulate matter from boilers were installed in 2005.
- Ongoing expansion of the West Refrigeration Plant involves upgrading refrigeration systems to increase overall efficiency, including the use of environmentally friendly 134-A Freon.
- In 2005, new coal under-throw stokers were installed to replace the original coal feeder systems. In addition, the CPP is replacing the stoker grate drive system in both coal boilers in 2007 and 2008. These modern systems should provide more efficient operation and coal combustion.
- The CPP is required to continuously monitor opacity, nitrogen oxides (NO_x), and oxygen emissions. New monitors were installed in 2005 and provide constant monitoring of emissions from the coal boilers.

We are working to make the CPP more energy efficient and to reduce emissions. However, this is a long-term effort and one that will take considerable investment. The ability to burn three fuels at the CPP assures reliability, provides flexibility, and ensures some protection against rapidly rising fuel costs as we can switch to a lower cost fuel at any time. However, to cease using one fuel completely would require significant capital improvements to the CPP, necessitate disruptive infrastructure changes to the Capitol complex, and increase average annual fuel costs by millions of dollars.

In addition to improving efficiencies at the CPP, there are a number of initiatives that we have planned to ensure the Capitol complex's continued compliance with the Energy Policy Act. To meet or exceed the EAct requirement of reducing energy use by another two percent in FY 2007, we plan to undertake the following projects, programs, and initiatives.

- Improve metering so that the impact of energy and water conservation projects can be measured rather than estimated.
- Continue purchasing Green Energy from Pepco Energy Services.
- Continue use of Energy Savings Performance Contracts (ESPCs) as a means to pursue projects that offer lifecycle cost-effectiveness but may require increased first-cost investment.

- Evaluate opportunities for onsite renewable energy generation such as use of photovoltaics and supplementing existing fuel with biodiesel.
- Evaluate opportunities for energy recovery both at the Capitol Power Plant and within individual buildings.
- Evaluate opportunities to conserve water throughout Congressionally administered facilities and grounds, and initiate projects such as vegetative roof surfaces to reduce storm water runoff to the public storm sewer system.
- Evaluate opportunities to reverse the rise in electricity consumption within individual buildings and the corresponding increase in the AOC's carbon footprint.
- Continue analysis of currently planned facility repairs and upgrades for energy and water savings opportunities.
- Increase communication with, and education of building occupants about current energy and water consumption within their facilities and the potential for reducing consumption through coordinated, complex-wide efforts.
- Continue development of the Capitol Complex Master Plan/Sustainability Framework Plan to ensure an overarching sustainable approach to facilities and grounds administered by Congress.

By practicing efficient energy management, we save taxpayer dollars, reduce greenhouse gas emissions, and protect the environment and natural resources. Our actions are making a difference and have saved energy across the Capitol complex. There is more we all can do to further conserve energy; however we need to ensure that the projects we chose to invest in are fiscally responsible, energy efficient, preserve the historic integrity of these landmark buildings, and have minimal adverse effects on the buildings' occupants, the local community, or on Congressional operations.

We agree with Congress that we need to not only comply with the Energy Policy Act of 2005 we should be leaders in the national effort to conserve energy. As stewards of the Capitol complex, we will continue to do our part to make this goal a reality.