

Final Report

Green the Capitol Initiative



Submitted to

Speaker Nancy Pelosi
Majority Leader Steny H. Hoyer

by

Daniel P. Beard
Chief Administrative Officer

June 21, 2007

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Executive Summary

Report to the Speaker and Majority Leader

Introduction

On March 1, 2007, the Speaker and the Majority Leader directed the Chief Administrative Officer of the House to develop a “Green the Capitol Initiative” that would demonstrate leadership to the nation by providing an environmentally responsible and healthy working environment for employees.

Global warming and climate change are serious issues. Scientists agree that the introduction of carbon into the atmosphere is causing climate change. Efforts to reduce carbon emissions need to begin immediately. Such changes will have a positive impact on the environment and the economy.

This report on the “Green the Capitol Initiative” meets the directives set out in your letter. “We cannot ask the American people to address global warming and climate change issues,” you noted, “without first carefully examining ways to reduce our own energy consumption and develop sustainable workplace practices.” This report, and its recommendations, will enable the House to be a leader in sustainable operations.

Environmental responsibility is our duty to future generations. Now is the time to act to reduce our energy consumption as well as our energy dependence. To accomplish this, we will change the way we do business. A sustainable House Capitol complex will recognize the full environmental impact of our decisions on energy and water consumption, materials use and the quality of our workplace. By taking these steps, we not only reduce the impact of House operations on the environment, but also provide leadership by example.

Goals & Strategies

This report recommends that the House adopt three goals for future operations:

1. Operate the House in a carbon-neutral manner by the end of the 110th Congress
2. Reduce the carbon footprint of the House by cutting energy consumption by 50% in 10 years
3. Make House operations a model of sustainability

To achieve the goals outlined above, a wide variety of strategies will need to be implemented. For each goal below, a summary of implementing strategies is provided. These strategies provide the roadmap to reducing the carbon footprint of the House while operating in an environmentally sustainable manner.

Goal #1: Operate the House in a carbon-neutral manner by the end of the 110th Congress (December, 2008)

Climate change and global warming are serious issues. Scientists agree that the introduction of carbon dioxide (CO₂) and other greenhouse gases into the atmosphere has serious effects. There are immediate steps the House can take to provide leadership to address global warming. The House can make the

operations of the House carbon-neutral, so that its net carbon dioxide equivalent (CO₂-e) emissions become zero.

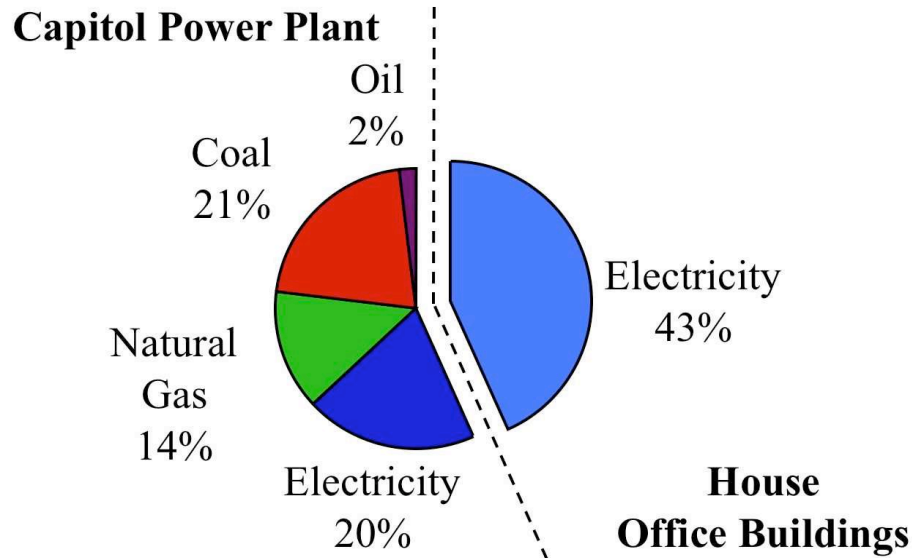


Figure ES-1. Total 2006 Carbon Dioxide-Equivalent Emissions for House Buildings

Using data developed by the Government Accountability Office, and reviewed by Lawrence Berkeley National Laboratory, it is estimated that the operation of the House complex was responsible for approximately 91,000 tons¹ of CO₂-e emissions in fiscal year 2006. This value is equivalent to the annual CO₂-e emissions of 17,200 cars.² Figure ES-1 shows the sources for the CO₂-e emissions for the House buildings by fuel type. Electricity is purchased from the local utility and provided directly to the buildings. Heating and cooling for the buildings is provided by the Capitol Power Plant (CPP), located on site. The CPP no longer produces electricity.

Three strategies are recommended to achieve carbon neutrality for the House buildings:

1. Purchase electricity generated from renewable sources
2. Switch from using coal, oil, and natural gas at the CPP to natural gas only
3. Purchase offsets for the remaining carbon emissions

¹ Tons = English short tons (1 ton = 2000 pounds).

² Estimates were derived using coefficients for CO₂-e emissions from the GAO April 2007 report and conversion factors for equivalent number of cars from the U.S. EPA (www.fueleconomy.gov).

Strategy #1: Purchase Renewable Power for Electricity Use

Electricity use is the largest source of CO₂-e emissions from House operations. To achieve the goal of making operations carbon-neutral the Chief Administrative Officer (CAO) and the Architect of the Capitol (AOC) have negotiated with our energy service provider to purchase 100% of the electricity needs, approximately 103,000 megawatt-hours per year, from renewable sources beginning October 1, 2007. The cost of electric power generated from renewable sources is an additional \$520,000 and that amount has been included in the Fiscal Year 2008 Legislative Branch Appropriations bill. By implementing this recommendation the House will eliminate 57,000 tons of the total CO₂-e emissions annually or the equivalent of removing 11,000 cars from the road.

Strategy #2: Operate the CPP with Natural Gas

The second strategy is to reduce the CO₂-e emissions from the coal burned at the CPP to meet the needs of the House of Representatives. It is recommended that the CPP use natural gas instead of coal to meet the needs of the House. By taking this action, CO₂-e emissions from the CPP can be lowered by 30% from the 2006 level, which is the equivalent of taking 1,900 cars off the road each year. Because the boilers already have dual-fuel capabilities, they can be switched to natural gas and can use alternate fuel, either coal or oil, as emergency back-up. The total cost to implement this recommendation in Fiscal Year 2008 is \$2.75 million. Money to purchase the natural gas is included in the Legislative Branch Appropriations bill.

Strategy #3: Purchase Carbon Offsets on the Chicago Climate Exchange

Even by using electricity from renewable sources and switching the generation of steam to natural gas, the House will still need to offset 24,000 tons of carbon emissions to achieve the goal of carbon-neutral operations. Therefore, it is recommended that all our remaining carbon emissions be offset by purchasing from the Chicago Climate Exchange carbon financial instrument contracts or carbon credits specifically for projects in the United States. These carbon financial instruments will be permanently retired so that the carbon credits cannot be used again. The Chicago Climate Exchange has been notified of the House's intent to initiate this action. The cost of offsetting 24,000 tons of greenhouse gases is estimated to be approximately \$95,000. Money is available in CAO's Fiscal Year 2008 budget to make these purchases. The CAO will purchase CO₂-e offsets equal to House-attributable emissions on an annual basis.

Goal #2: Reduce the carbon footprint of the House by cutting energy consumption by 50% in 10 years

While the House can achieve carbon neutrality by the end of the 110th Congress, the long-term goal should be to lower our carbon emissions, or the "carbon footprint," by reducing energy consumption. Cost-effective investments in energy efficiency will pay for themselves and reduce the House's annual operating costs. The goal of reducing the House's energy use by 50% over the next 10 years should be adopted. The specific strategies identified in the following pages outline the steps needed to achieve this goal. After careful examination of the current carbon emission and energy use of the House and analyzing the recommendations contained in this report, it is feasible for the House to achieve the 50% energy reduction goal. In carrying out this goal, every opportunity will be taken to purchase American-made, energy-efficient technologies.

Before detailing each of those recommendations and outlining its effects, it is important to provide the following background on the energy use and carbon footprint of House operations.

Figure ES-2 estimates where energy was used during 2006 in the House office buildings, based on data from AOC and additional analyses. To reduce total House energy use by 50% over the next ten years, energy use will have to be reduced five percentage points per year. This is more than twice the Energy Policy Act (EPAct) of 2005 requirement of 2% reductions in energy use per year for federal buildings.

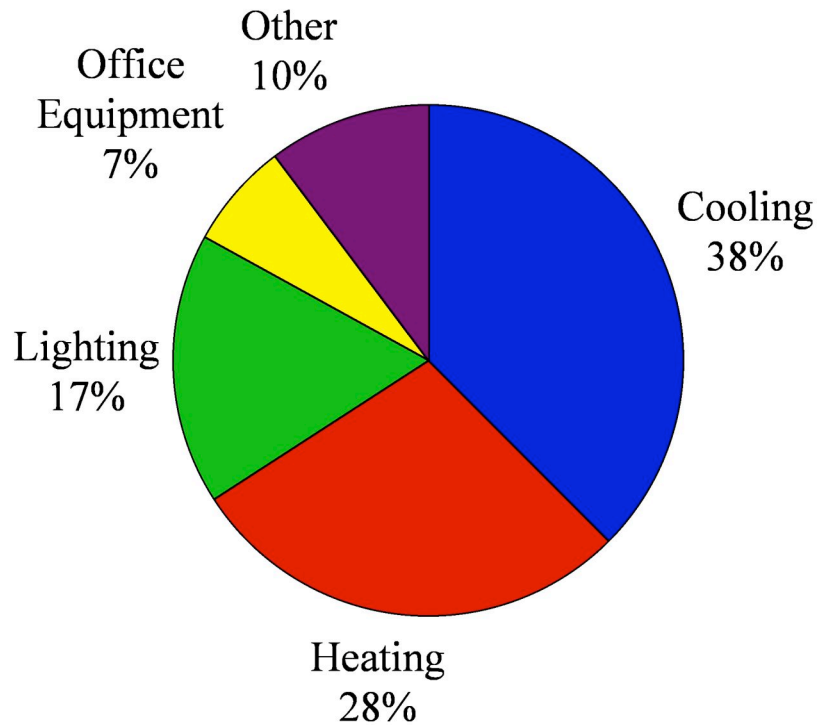


Figure ES-2. Total Energy Use for House Buildings by End Use.

The largest use of energy in the House buildings is for cooling (38%) followed by heating (28%), lighting (17%), office equipment (7%), and miscellaneous other uses (10%), such as ventilation fans, elevators, and other equipment and appliances.

Figure ES-3 shows how the proposed goal for cutting energy use by 50% by 2017 will be achieved. The reductions mandated under the 2005 Energy Policy Act are indicated by the blue dotted line. The proposed strategy more than doubles those savings.

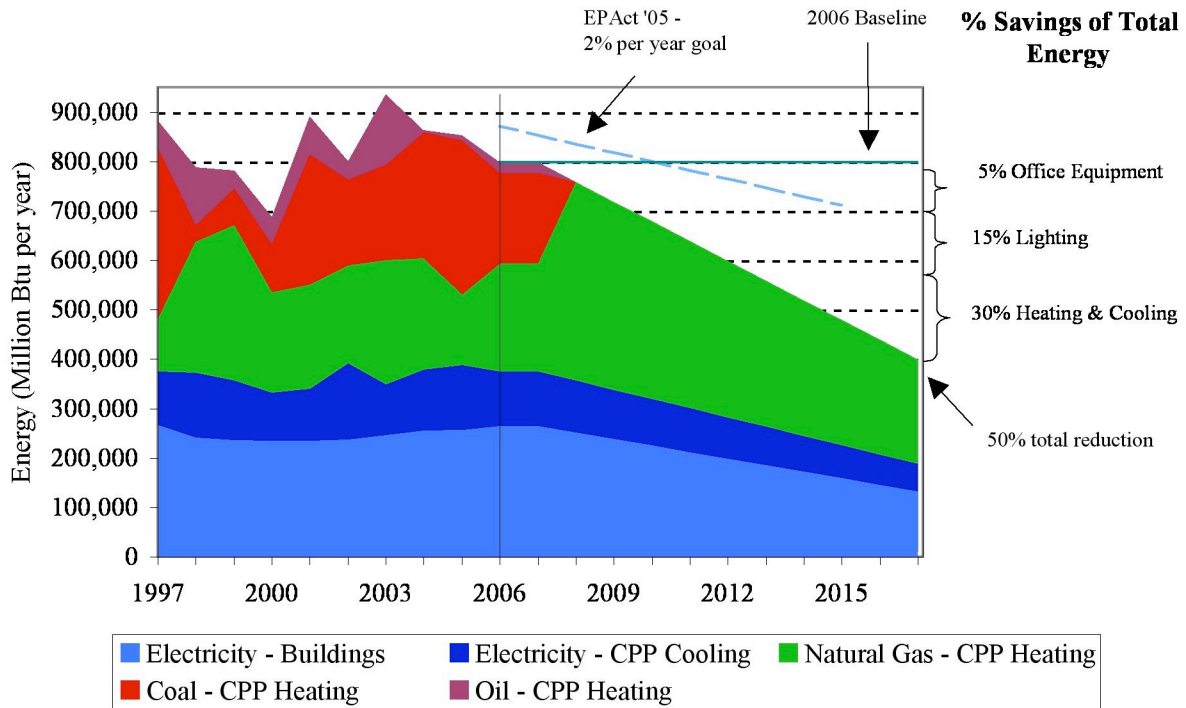


Figure ES-3. Energy reduction scenario for the House attributable consumption due to improved efficiency measures

To achieve the 50% goal, the House will have to employ an optimal mix of life-cycle cost-effective investments in energy efficiency. Figure ES-4 shows how the increased costs necessary to achieve the carbon-neutral strategy will be repaid through energy savings actions.

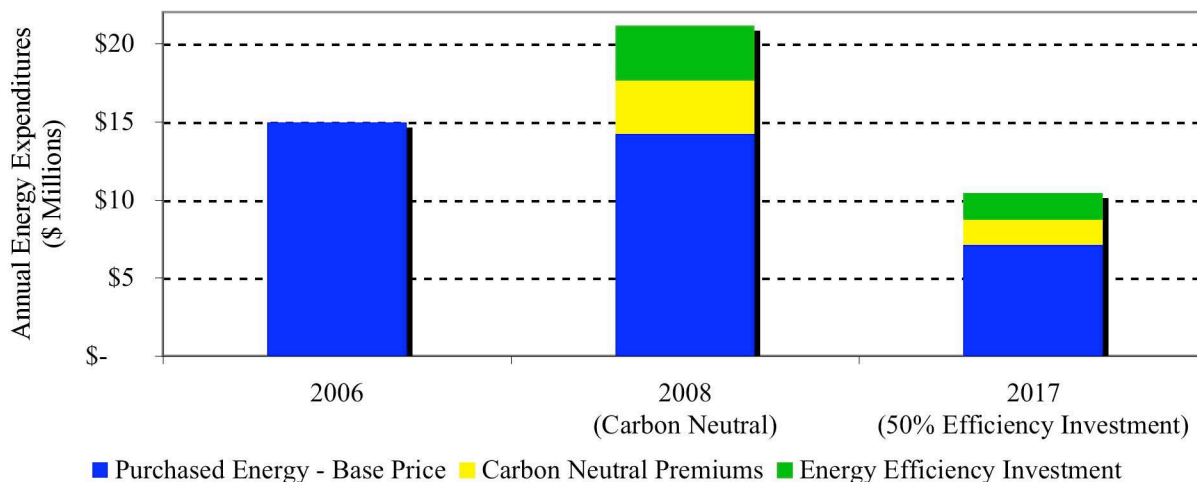


Figure ES-4. Total carbon-neutral scenario costs

Figure ES-4 shows that over a 10-year period, the reduced demand for energy from the cost-effective energy retrofits pays for the increased premium for electricity produced by renewable sources, the costs of switching to natural gas, and the purchase of carbon offsets. These estimates do not include the savings from eliminating fly ash disposal from burning coal, as well as from other direct and indirect environmental benefits.

Investments in energy efficiency should not be delayed if appropriated funds are not available. Congress in Energy Policy Act of 2005 recognized the value of alternative financing mechanisms as a means to leverage private-sector funds to make improvements in public-sector operations. Through alternative financing mechanisms private parties provide funding for energy efficiency projects and they are repaid by the savings. The use of such alternative financing mechanisms where appropriate to move projects forward is a sound approach to help reach the energy efficiency goals.

Two sets of specific actions should be taken: (1) reducing energy consumption in House office buildings and (2) reducing energy consumption at the CPP. This initiative will maximize the use of American products and services.

(1) Recommendations for House office building operations:

- Use metering, commissioning, and tracking to improve operating efficiency and management
- Install/upgrade steam meters for all House buildings
 - Install/upgrade chilled water meters for all House buildings

- Optimize major steam and chilled water systems for energy efficiency during different seasons
- Use utility tracking to monitor energy use during various times of day to identify energy savings opportunities
- Install energy efficient lighting
 - Retrofit ceiling lamps, fixtures, and controls to increase energy efficiency
 - Evaluate motion-activated lighting in offices, service corridors, tunnels, and parking areas to reduce energy use
 - Replace desk lamps with energy-efficient bulbs
 - Conduct high-efficiency ceiling lighting pilot program
 - Evaluate exterior building lighting to reduce energy use
- Adopt new technologies and optimal operating practices for electronics and office equipment
 - Change computer operations to allow staff to centrally power-down equipment when unused for significant periods such as nights and weekends
 - Maximize power management efforts present in existing electronic equipment through periodic audits and employee education
 - Develop a preferred list of Energy Star-qualified office electronics
 - Devise strategies to consolidate equipment
- Update heating, ventilation, and air conditioning equipment and practices
 - Retrofit motors, fan drives, pumps, and valves with energy-efficient models.
 - Modify CAV equipment and controls so that air-handling systems operate as VAV systems
 - Seal air distribution ducts to minimize air leakage
 - Optimize fan schedules to avoid unnecessary equipment operation
- Make computer rooms and servers more energy efficient
 - Improve operational control of data center auxiliary cooling and power systems
 - Consolidate servers distributed throughout House buildings into dedicated server rooms
 - Consolidate many lightly-used servers into fully-utilized server systems
 - Adjust air distribution in computer rooms for thermal optimization
- Evaluate food service practices, elevator and vending machine energy efficiency, hot water use, laundry and dry cleaning services, fitness center operations, and other House services for energy savings opportunities
 - Inventory current equipment and schedules to identify energy savings opportunities
 - Install new energy-efficient equipment and operating strategies emphasizing products made in America

(2) The CPP is the largest single source of carbon emissions on the Capitol Hill. As noted earlier, switching to natural gas will reduce the CO₂-e emissions of the CPP by 30%. The plant's

operation has also been controversial because of visual and health concerns among Capitol Hill residents. It is important for Congress to take a leadership role in modernizing and updating this facility. It is recommended that the committees of jurisdiction be instructed to review the plant's operation, and develop appropriation guidance, including legislation if necessary, to make the plant a model of efficient operations and sustainability. This legislation should be passed by the end of the 110th Congress.

Making changes to the CPP will take many years to plan, finance, and implement. During this interim period, the following actions should be taken to optimize operations of the CPP to maximize energy efficiency and reduce energy consumption:

- Improve steam production efficiency
 - Evaluate reducing boiler steam pressure output from 200 PSI to 150 PSI
 - Implement best practices for operations and maintenance
 - Monitor energy efficiency performance
- Improve chilled water production efficiency
 - Implement best practices for operations and maintenance
 - Retrofit motors with premium efficient motors
 - Evaluate retrofit potential of variable-speed drives on pump motors
 - Monitor energy efficiency performance
 - Evaluate new efficient chillers for West Refrigeration Plant
- Improve steam and chilled water distribution systems
 - Improve maintenance of steam traps, increasing steam system distribution efficiency
 - Determine need for new insulation of all distribution lines to reduce heating and cooling losses
 - Adjust steam delivery pressures where practicable to follow heat load requirements in Capitol buildings

Goal #3: Make House operations a model of sustainability

In addition to improving the way the House consumes energy, the House should provide an environmentally sustainable and healthy working environment for employees. The House has the opportunity to lead by example by making its business operations a model of sustainability. In order to achieve this goal, every attempt will be made to purchase American-made environmentally sustainable products.

Strategy #1: Direct the CAO to Oversee Implementation of “Green the Capitol Initiative”

The Office of the CAO should be charged with responsibility to oversee implementation of the “Green the Capitol Initiative” for the House of Representatives. This includes working with the AOC and other offices to improve the sustainability of the day-to-day operations of the House office buildings including maintenance, finance, transportation, childcare, and food service.

Strategy #2: Develop a House Sustainability Plan

In June 2007, the CAO convened a meeting with three sustainability leaders from major universities that are championing sustainability. Representatives from Harvard, Yale, and the University of California provided briefings on their goals, operations, and successes. A key component of their success has been a sustainability plan that provides focus and direction to reform efforts. It is recommended the CAO develop and implement a House Sustainability Plan as a dynamic document intended to provide a roadmap for major steps toward sustainability over the next 20 years and to identify timetables for specific actions.

The CAO and the AOC should be directed to take the following specific actions under the Sustainability Plan:

- Improve indoor water use efficiency
 - Install additional water meters
 - Analyze water consumption and quality patterns
 - Install low flow water fixtures
- Adopt sustainable practices for site and landscape
 - Implement conservation measures for irrigation
 - Improve storm water control to reduce runoff
 - Decrease pesticide use to improve runoff water quality
 - Expand tree canopy
- Improve employee access to transit options and reduce transportation energy use
 - Demonstrate a commitment to alternate fuels through installation of an E-85 ethanol fueling station
 - Replace the current House motor vehicle fleet with efficient, hybrid, or alternative fuel vehicles
 - Establish an employee transit coordinator position
 - Centralize the House transit benefit program and increase the benefit level
 - Implement a Bike to Work program
 - Implement a car sharing program
- Implement sustainable practices in the House's food service system
 - Purchase serviceware products recommended through the U.S. EPA Environmentally Preferable Purchasing Program
 - Establish goals for supply of locally and organically produced food
- Reduce environmental impact of materials through purchase of locally or regionally produced products, and standardize where possible to reduce inventory and procurement costs
 - Specify low-VOC paints, furniture, carpet, and other furnishings emphasizing products made in America
 - Specify office furnishing containing recycled content, bio-based products, or certified wood, emphasizing products made in America

- Purchase office electronics certified through the Electronic Product Environmental Assessment Tool (EPEAT)
- Procure 100% recycled and 30% post-consumer content paper and recommend measures to reduce paper consumption
- Divert 50% of the building occupant waste stream through improved recycling program
- Purchase cleaning supplies that meet the requirements of Green Seal Standard for Industrial and Institutional Cleaners, Standard GS-37; and for floor products, Standard GS-40

Strategy #3: Leadership, Education, and Outreach

The CAO should pursue networking and outreach with the Senate, universities, businesses, local and state governments, and others to remain current on sustainability practices and CO₂-e emission reduction opportunities. The networking can showcase the House’s leadership role and facilitate the exchange of ideas and information on environmentally sustainable issues. This activity could include hosting green summits on sustainability. The CAO should also work with the AOC to make sustainability a mission-critical element of the AOC’s business practices.

Recommendations for specific actions include:

- Prepare a checklist for sustainable office operations for use by Members of Congress and other Capitol Hill offices
- The House should take a leadership role in networking with the Senate, universities, businesses, and local and state governments including hosting green summits
- Hold a green expo for House offices to demonstrate the latest in green products or services available from commercial vendors
- Work with the AOC to make sustainability a mission-critical element
- Provide energy efficiency and sustainability materials for Capitol Hill visitors

Strategy #4: Develop Mechanisms for Evaluating Success and Reporting Progress

The CAO should track benchmarks for energy consumption and CO₂-e emissions monthly and prepare annual reports documenting progress on the complementary goals of carbon neutrality and sustainable operations. Energy and CO₂-e emissions data will be made available on a website, both as an educational tool and to provide feedback to House staff.

Conclusion

This report provides a roadmap for carbon neutrality, energy efficiency, and operating in an environmentally sustainable fashion. It demonstrates that the House can operate in a carbon neutral manner now and begin to implement energy efficiency measures today. The report provides the way forward to cutting the House’s energy use by 50% in 10 years. It shows how the House can do business in an environmentally sustainable manner. Implementing these goals is a good investment for the American taxpayer, the environment, and our children’s future.