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'Greening the Capitol' Gets Technical Assistance from Berkeley Lab

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BERKELEY, CA — The House of Representatives of the United States Congress has decided to set an example by reducing its carbon footprint, an announcement which came from House Speaker Nancy Pelosi and colleagues on April 19. Researchers at the Department of Energy's Lawrence Berkeley National Laboratory (Berkeley Lab) provided technical assistance to House staff as they developed their plans.



[The Cannon House Office Building Rotunda](#)

At the news conference, Speaker Pelosi accepted a "Green the Capitol Initiative" report prepared by the Chief Administrative Officer of the House, Daniel Beard. The report provided a number of recommendations to reduce the environmental impacts of the House building complex. Beard's first recommendation was to operate the House in a carbon-neutral manner—this will require that the House takes steps to reduce its energy use through investing in energy efficiency, purchasing renewable sources of electricity, and finding additional ways to offset its total emissions of greenhouse gases.

The report identified a number of measures that the House could take to reduce its carbon emissions, including aggressively adopting energy efficiency and adopting sustainable business practices such as purchasing only ENERGY STAR™-qualified products and supplies.

"A sustainable House Capitol complex should recognize the full environmental impact of our decisions on energy and water consumption, materials, and the quality of our workplace," Beard wrote. "By taking these steps, we not only reduce the impact of House operations on the environment, but we also provide leadership by example."

Researchers in the Environmental Energy Technologies Division (EETD) of Berkeley Lab worked with Beard's staff to analyze the current energy use and resulting carbon footprint of House facilities and offered some cost-effective measures to reduce it. Rick Diamond, a scientist who coordinated the efforts of the EETD working group on this project, notes, "Both the Office of the Chief Administrative Officer and the Architect of the Capitol had numerous ideas on how to improve energy use at the complex. Our job was to review their current energy use, look at the carbon impacts, and recommend early actions that could be taken."

Energy Use and the House Carbon Footprint

Using data provided by the Architect of the Capitol, the Lab's Evan Mills and others on the team determined that the House complex is responsible for emitting about 91,000 tons of carbon dioxide in 2006, equivalent to the annual emissions of 17,200 cars. The largest form of energy used is electricity (63 percent of total energy use), about half of which was generated from coal-fired power plants.

Scientist Francis Rubinstein, working with the Chief Administrative Office, found that replacing the incandescent bulbs in 12,000 desk lamps of the House complex could save \$245,000 in electricity costs per year and remove the equivalent of 255 cars' worth of emissions of carbon dioxide. The report recommends immediate conversion of 2,000 lamps to compact fluorescent lights (CFLs), followed by conversion of the remaining 10,000 over the next six months. It also recommends eliminating the purchase of incandescent bulbs for use in standard (i.e., non-historic) fixtures.

Converting overhead ceiling lights to more energy-efficient fluorescent lamps could reduce lighting energy use by up to 50 percent, equivalent to removing 7,130 tons of greenhouse gas emissions, or those of 1,340 cars.

Craig Wray and Ryan Firestone examined the heating, ventilation and air conditioning systems of the House buildings and Capitol Power Plant and recommended measures to improve their energy efficiency. One is to use aerosol-based duct sealing to make sure the building's duct system is tight, and wasting as little conditioned (heated or cooled) air as possible. Recent research at Berkeley Lab suggests that duct leakage can increase fan energy use 25 to 35 percent. Wireless control technologies can also improve the efficiency of fan ducts.

Applying Green Business Practices

Other Berkeley Lab researchers focused on analyzing the potential benefits to House operations from reorienting their purchasing to energy-efficient and environmentally friendly products. Christopher Payne, Alan Meier, and Bruce Nordman examined the opportunities available in office electronics. For example, one recommendation specified the purchase of Energy Star-qualified office equipment, which is in the top 25 percent of the market in terms of energy efficiency. Christopher Payne notes "These are equipment purchases that will occur as a standard part of House business operations," Beard's report said. "By adopting these purchasing requirements, the House uses taxpayer dollars to reduce energy consumption, achieve significant cost savings, and help avoid pollution and greenhouse gas – all at what is often zero additional first cost."

The preliminary report is the first step toward implementing changes to achieve the goal of carbon-neutral House operations. Berkeley Lab researchers will continue to provide input to the CAO, which plans to issue the next report in June, with implementation of some of these steps to begin immediately. Steve Selkowitz noted that the Berkeley Lab team is excited about developing more detailed recommendations for the implementation phase. "Our team has been energized by the fast-track schedule we followed to assist the CAO in the first phase of the project," he said. "We now have a great opportunity to apply a wide range of 'lessons learned' from years of our DOE-supported buildings R&D activities to a new set of challenges and priorities in the Capitol complex."

Besides the names mentioned above, other EETD staff participating in the preparation of the report included Barbara Atkinson, Peter Biermayer, Brian Coffey, Ryan Firestone, William Fisk, Philip Haves, Michael Holda, Eleanor Lee, Paul Mathew, Mary Ann Piette, Ryan Wiser, and Tom Wenzel.

A copy of the report can be downloaded from the "Greening the Capitol" page at <http://www.speaker.gov/>

The press release announcing the effort is here: <http://www.speaker.gov/newsroom/pressreleases?id=0149>

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