

Case Study:

National Geographic Society

Washington, District of Columbia

Facilities' Value Increases by \$24 Million Through Upgrades and Going Green

In its mission "to increase and diffuse geographic knowledge," the National Geographic Society has become an advocate for preserving the planet's natural resources. Guided by the expertise of Johnson Controls, Inc., the Society's headquarters complex in Washington, D.C. became the first facility to achieve the Leadership in Energy and Environmental Design for Existing Buildings (LEED-EB) certification in November 2003.



16th Street building

The National Geographic Society has become one of the world's largest scientific and educational non-profit organizations since being established in 1888. After more than a century, the organization is propelled by new concerns, such as the pressing need to protect the planet's natural resources. The Society took a leadership position in committing to examining and upgrading systems and equipment at its own facilities. Upgrades to HVAC and interior lighting systems, and to green-building operating practices at the 840,000-square-foot headquarters complex generated 8 to 11 percent savings in energy costs and national recognition. The \$7 million infrastructure upgrade increased the value of the Society's facilities by \$24 million. The increased value helps the Society maintain a better credit rating, giving it more borrowing capacity at a reduced rate.

Achieving LEED-EB certification became a goal after Johnson Controls introduced the Society to the LEED-EB pilot program launched by the U.S Green Building Council. "Johnson Controls thought the National Geographic Society was an ideal candidate for the program because of the age of our buildings, which range from 20 to 102 years old," states Robert Cline, director of general services.

The organization entered into a two-part performance contract with Johnson Controls. One part involved a guaranteed savings in energy usage, while a second part pertained to achieving LEED-EB certification. "Our main goal was to operate facilities that reflected our mission while remaining cost effective. We were committed to not only receiving certification, but also to being the first organization to do it," declares Cline. This commitment has resulted in reduced electrical costs of approximately \$300,000 annually, achieved in part through the performance contract with Johnson Controls and internal conservation measures completed over the past few years.

Green Buildings Vision is Engineering Challenge

Success of the project relied on the Society's maintenance department and Johnson Controls to locate areas for upgrade, review plans and specify products. "It's not often that a chief engineer in an office building has the opportunity to be involved with the level of equipment changeout that took place here," says Richard Neal, chief engineer. Neal worked with Johnson Controls, engineers and architects to redesign space and specify the most energy efficient and environmentally friendly equipment available.

Energy and atmosphere upgrades involved replacement of chillers, boilers and air-handling systems, installation of variable-speed drives, window film and energy-efficient lighting, and upgrades to premium-efficiency motors and digital direct controls. Equipment operation time was fine-tuned, allowing as much as 15 minutes to be shaved off scheduled start and stop times of certain equipment. An energy management paging system helps maintain efficiency by monitoring critical equipment, temperature and humidity limits throughout the facilities.

Sustainable site efforts included white roof replacement, increased bike rack capacity and reduced exterior light pollution. Water conservation measures included efficient flush valves, low-flow faucet aerators and controls, and irrigation system rain gauge controls. Indoor air quality projects included asbestos abatement, ventilation and exhaust airflow verification, and upgraded building management system controls for CO₂ monitoring and improved temperature and humidity control.

"Some of the upgrades posed particular challenges," notes Neal. For instance, replacement of chillers and boilers required workers to take down walls and doors. The equipment needed to be replaced in the off-season to avoid discomfort to building occupants. New equipment footprints also required the rerouting of wiring and piping. "In addition, tight schedules required Johnson Controls to constantly transition from one project to the next," adds Neal.

Adopting Green Operating Policies

Cline indicates that the National Geographic Society has always been proactive in its approach to resource conservation. Neal adds, "We've been controlling our energy consumption for more than 15 years through different programs." Continuing that effort, the Society and Johnson Controls implemented additional policies, including construction waste and contractor materials management, resource reuse and recycling, green housekeeping management and an indoor air quality management plan.

In addition, erosion control efforts were used during the site improvements. Hybrid vehicle parking and telecommuting, along with green landscaping, snow and pest removal, have all been implemented. A measurement and verification plan has also been implemented by Johnson Controls to monitor the effects of the Society's energy initiatives. "We will continue to examine our energy consumption," states Cline. "Participating in the LEED-EB program with Johnson Controls has been an excellent benchmarking tool that will allow us to continue to measure our environmental stewardship efforts going forward."



Hubbard Street building

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Director of General Services
National Geographic Society



M Street building