



Leading Colorado into a New Energy Economy

Within the first six months of assuming office, Governor Bill Ritter signed two executive orders which charged state departments, agencies and offices to take a position of leadership in the New Energy Economy for Colorado ["Greening of State Government Executive Orders" (D011 07 and D012 07)]. These measures mandated changes to the operation of the state government to achieve energy efficiency, lessen environmental impacts, increase recycling efforts, and reduce waste for all activities associated with state government. In order to demonstrate the leadership of state government to meet the ambitious goals set by the Governor, the Department of Personnel and Administration (DPA) formed a project team with Lance Shepherd, Manager, Design and Construction Programs, Office of the State Architect, Richard Lee, Energy Manager, Capitol Complex, and the Governor's Energy Office (GEO) to begin greening the State Capitol Complex.

Challenges

The project team was faced with a number of challenges. Among them were finding a way to fund the upgrades to the Capitol Complex, getting buy-in and participation from multiple tenants and building maintenance teams, and compliance with regulations set forth by the State Historical Society. One of the most significant challenges was the age of the Complex. The Capitol is the oldest building in the Complex, constructed in 1894. There are inherent difficulties working on a building which is not only over 100 years old, but one that also carries a historic designation. As such, there are substantial restrictions on what can be retrofitted. For example, modified lighting fixtures must still provide ample light and not drastically change the mood of lighted spaces.

"Even with historic structures as old as our Capitol, we have become a leader in energy reduction and energy efficiency. Not only does this benefit the environment, but we will save taxpayers \$1 million a year on reduced and avoided energy costs."

Governor Bill Ritter, Jr.

Energy Performance Contracting



The Department of Personnel and Administration used the GEO's Performance Contracting Program to implement a solution to fund the project without using taxpayer money. Under the terms of an energy performance contract, a private energy service company (in this case Chevron Energy Solutions) identifies a list of cost effective measures which can be taken to avoid utility expenses, arranges for financing, and installs the equipment. The money saved on utility bills provides the funding for building and equipment upgrades over a period of approximately 20 years. The \$23 million energy performance contract assembled by the DPA was used to not only fund upgrades at the State Capitol Complex, but also buildings for the Colorado Department of Labor and Employment and the Colorado State Judicial Branch.

LEED Certification

Where the energy performance contract provided financing for the project, the LEED® Green Building Rating System provided the perfect framework for the project team to guide the renovation of the Complex, by focusing the team on a common goal, and providing means to achieve notable recognition. The Colorado State Capitol is the only state capitol building to achieve any type of LEED® certification, and the first building of any kind to receive the LEED for Existing Buildings: Operations & Maintenance designation.

Guidelines for LEED EB O&M (LEED for Existing Buildings: Operations and Maintenance) address six different areas: the sustainability of the site, water efficiency, energy efficiency, materials and resources, indoor environment quality, and innovative operations. LEED EB O&M requirements gave facility managers a roadmap to follow as they worked with Chevron Energy Solutions (CES) to implement measures to renovate the Complex and improve operational efficiencies.

CES contracted green building consultant CTG Energetics to help facilitate the LEED certification process. CTG assisted with building audit and analysis, led training workshops, and worked to get buy-in from on-site facilities teams through workshops on the benefits and best practices of sustainable facilities.



Steps Taken

Following LEED guidelines and scorecards, the project team was able to earn LEED credits in every major category. Among all initiatives the team worked on, some of the significant efforts include:

Green Cleaning Program: A green cleaning program yields significant environmental benefits and greatly improves occupant health and indoor air quality. The exterior of the Capitol is cleaned using a mixture of vinegar and water, eliminating the use of harsh chemicals. Cleaning products used indoors must be Green Seal certified and the janitorial staff is now properly trained on product use, technique, and waste disposal.

Recycling Program: Capitol Complex Energy Manager, Richard Lee, coordinated the set up of the recycling program, including conducting waste audits and testing different methods and placement of collection points.

Water Fixture Retrofits: In collaboration with Denver Water, overall water consumption was reduced through the installation of low-flow toilets, urinals, and faucet aerators.

Sustainable Purchasing Policy: The Capitol Complex has adopted a policy to source products which are manufactured, packaged, and transported with consideration to environmental impacts. The policy requests that suppliers use recycled materials for packaging and encourages the purchase of only low VOC (volatile organic compound) products such as paints and carpets. Staff is also encouraged to order sustainable office supplies, furniture, and equipment.

Lighting Retrofit: A collection of compact fluorescent (CFL) bulbs replaced halogen and incandescent lamps, which resulted in immediate and significant energy savings.

Environmentally Friendly Landscaping and Grounds Maintenance: Non-fertilizer treatments were selected for the lawn in order to eliminate nitrate pollution, and corn-based snowmelt is used to reduce the amount of harmful chemicals introduced to vegetation and the water supply. Additionally, erosion and sediment controls help mitigate soil loss and prevent damage to air and water quality. Irrigation controls and the use of native or regionally adaptive plants were also addressed as part of the landscape and site management plan.

Results and Benefits

- _Projected \$1M per year in reduced and avoided energy costs for the Capitol Complex
- _The lighting retrofit is expected to yield over 360,000 kWh/yr, enough to power 32 homes, and reduce CO2 emissions by over 746,000 lbs CO2/yr, equivalent to removing 68 cars from the road
- _Green Cleaning and Sustainable Purchasing programs improve occupant health and comfort through the use of non-toxic products and low VOC materials

Goals for Greener Government

The State Capitol Complex LEED certification project is a highly visible example of Governor Ritter's Greening Government initiative. As of December 2008, 13 other state facilities are LEED certified, most recently the Governor's residence at the Boettcher Mansion. Beyond using the USGBC LEED Rating System, Governor Ritter's goals for Greening Government include achieving the following milestones by 2012:

- 25% petroleum reduction
- 20% energy reduction
- 20% paper reduction
- 10% water reduction

The state of Colorado is a proud member of the US Green Building Council. For more information on the Governor's Energy Office and to view other case studies on energy performance contracting, please see the GEO website at www.colorado.gov/energy.



Richard Lee

Energy Manager
Department of Personnel & Administration
Division of Central Services
Capitol Complex
1525 Sherman Street, Suite B-15
Denver, CO 80203
Phone: (303) 866-3838
Email: Richard.Lee@state.co.us

Angie Fyfe

Greening Government Program Manager
Governor's Energy Office
1580 Logan Street, Suite 100
Denver, CO 80203
Phone: (303) 866-2059
Email: Angie.Fyfe@state.co.us

Lance Shepherd

Manager, Design and Construction Programs
Office of the State Architect
Department of Personnel and Administration
1313 Sherman Street, Suite 319
Denver, CO 80203
Phone: (303) 866-3450
Email: Lance.Shepherd@state.co.us