

Successful Geothermal Heating/Cooling System Means Cowlitz County Can Implement More Energy-Efficiency and Facility Improvements

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Washington State – Known as the “Gateway to Mount St. Helens,” Cowlitz County is home to approximately 94,000 residents. With a commitment to preserving the heritage of Cowlitz County, both environmentally and culturally, as part of its mission statement, the County engaged Siemens Industry, Inc., in a successful geothermal heating/cooling project.

The all-green geothermal heating/cooling system came online for the Cowlitz County Hall of Justice in 2011, and is believed to be the first of its kind in the state.* The system uses the earth’s temperature to heat and cool water for the County’s HVAC system, reducing the amount of electricity needed to warm the HVAC water to the correct temperature in winter; no additional cooling is required in summer. The fully renewable system is reducing the County’s energy costs by approximately \$76,000 annually.

Because the geothermal heating/cooling project has been successful for the County, officials engaged Siemens again in 2012 to kick off a second project: an Energy Savings Performance Contract (ESPC) to make a variety of energy-efficiency and facility improvement measures.

Objectives

Overall, Cowlitz County wanted to protect its environmental heritage, and continually seeks ways to improve the energy and resource efficiency of County buildings. To achieve that objective, the County sought ways to:

- Reduce the County’s energy and natural resource consumption
- Diminish the effects of rising utility costs that have affected the State of Washington
- Improve building performance and comfort

The ESPC model will allow the County to make necessary facility improvements while leaving capital funds intact. Instead of traditional financing, the County wanted to be able to fund the improvements through the energy and operational savings generated by the project.

*LaBoe, Barbara. “Cowlitz Hall of Justice to Implement Green Geothermal System.” *The Daily News Online*. Longview Daily News, 3 Mar. 2011.

Siemens Solutions

Through a 15-year ESPC, Siemens is implementing the following improvements for Cowlitz County:

- Lighting retrofits – Siemens is upgrading several buildings' light fixtures from T-12 fluorescent lamps with magnetic ballasts to low-wattage T-8 fluorescent lamps with electronic ballasts. In addition, Siemens will replace incandescent lamps with energy-efficient compact fluorescent lamps; install occupancy sensors in private offices, conference rooms, restrooms, and so on; and upgrade outdoor fixtures with LED bulbs. These changes will not only reduce energy consumption and costs for Cowlitz County, but also help reduce operational and maintenance costs associated with relamping and bulb life.
- Domestic water conservation/fixture recommissioning – Cowlitz County facilities will receive plumbing fixture upgrades to reduce the amount of water consumed by various fixtures, including sinks, toilets, and showers.
- HVAC improvements – In the Hall of Justice, Siemens will replace aging heat pump chiller units to match existing capacities and ensure the improvements are connected to the County's building automation system. The existing units require significant maintenance time and expense, and the new, stackable heat pump system is highly efficient, helping achieve the County's objectives.
- DDC retrofits – Siemens is retrofitting existing controls with direct digital controls (DDC) for various mechanical equipment.

As part of the agreement with Cowlitz County, Siemens will provide annual inspections of various equipment to ensure they operate as designed.

Customer Results

Today, Cowlitz County is already realizing utility cost reductions from lighting upgrades and water conservation efforts. When all of the projects are complete, Siemens estimates that Cowlitz County will realize approximately \$167,000 in energy and operational cost reductions in the first year following implementation. Over the 15-year contract term, energy and operational savings are projected to reach nearly \$2.9 million.

Specifically, Cowlitz County will reduce its energy consumption every year by:

- Electric energy - 1,849,815 kWh
- Natural gas - 1,738 therms
- Water - 1,513,219 gallons

The electric energy savings reflect the equivalent of removing 272 passenger vehicles from the road every year, or eliminating the CO2 emissions from 195 homes annually. Natural gas savings are equivalent to the amount of carbon sequestered by 7.1 acres of a U.S. forest in a year.

Additionally, with the reduced energy and resource consumption, Cowlitz County is better prepared for rising utility costs, a challenge that's affecting customers throughout the State of Washington.

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