

Case study

# City of Grand Junction

Grand Junction, Colorado



## City's resolution drives energy efficiency, sustainability and capital improvements

In 2007, the City of Grand Junction, Colorado signed a resolution committing to energy conservation efforts whenever and wherever feasible. Following that resolution, the city entered into a performance contract with Johnson Controls to conduct facility improvements and leverage renewable energy technologies to improve its overall energy efficiency. As a result, the city is expected to reduce its annual energy budgets by 19 percent and save \$1.2 million in energy and operational costs over the life of the contract, while lessening its impact on the environment.

Along with Grand Junction's resolution came the formation of an energy conservation team dubbed CORE (Conserving Our Resources Efficiently). The team's task is to assess and monitor the progress of proposed initiatives and current conservation practices, work to introduce new practices, and explore new conservation opportunities from other communities and outside entities. In addition, the city established specific goals including a 20 percent reduction in energy consumption and a 10 percent reduction in water consumption at all city facilities by 2012.



Upgrades to the city's public pool included a new boiler and an innovative liquid pool cover system.

Johnson Controls, one of four companies that responded to CORE's request for proposal, was awarded a performance contract to conduct energy efficiency improvements. In addition to an energy audit, Johnson Controls proposal focused on reducing the city's annual utility spending, upgrading old building systems and equipment, reducing city operations environmental impact, sustainable energy education, and supporting the city's goal of providing high quality and cost effective services to citizens.

Upgrades to the city's public pool included a new boiler and an innovative liquid pool cover system. A non-toxic chemical injected into the pool's circulation system forms a protective film that inhibits water evaporation and heat loss. Other improvements made by Johnson Controls include programmable thermostats, water cooler timers, vending misers and installation of high efficiency HVAC equipment in select facilities.

Under a separate performance contract, Johnson Controls performed HVAC equipment upgrades, high-efficiency lighting retrofits, water conservation measures and building envelope improvement at the city's Persigo Wastewater Treatment Plant. The improvements are expected to yield over \$23,000 in utility savings annually.

## Identifying facility improvements for more efficient building operations

Johnson Controls conducted a six-month energy audit on 39 facilities and worked with the CORE team to evaluate a wide variety of possible facility improvement measures. The team limited improvements to only those buildings that will still be in use in 15 years, which is the term of the performance contract. In addition, projects were eliminated where the energy savings weren't worth the upfront capital expenditure.

A total of 74 facility improvement measures were identified and implemented in 19 buildings and numerous parks facilities. Lighting retrofits including occupancy sensors were completed in most facilities along with water conservation efforts that make use of low-flow fixtures and controls. Infiltration improvements were also made that added caulking, sealants and weather stripping to most of the city's buildings in attics, walls, and around doors and windows.

## Solar photovoltaic systems reflect effort to be more sustainable

Grand Junction has taken a leadership role in sustainability and energy conservation. The performance contract with Johnson Controls included the design and installation of solar photovoltaic systems at Grand Junction's Visitor Center and its Two Rivers Convention Center. "Installation at these highly visible locations serves as a demonstration of what can be done as well as saving energy," says Jim Stavast, facilities services manager. He notes that there is an ancillary benefit as well because the city can use the upgrades as marketing tools.

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**JIM STAVAST**  
FACILITIES SERVICES MANAGER  
CITY OF GRAND JUNCTION



A 15 kilowatt solar photovoltaic system was installed on the Two Rivers Convention Center.

The two systems can generate up to 5 and 15 kilowatts of electricity, respectively, and account for nearly \$4,000 of the projected annual electrical utility savings resulting from the performance contract.

When combined with the rest of the facility improvement measures completed under the contract, the project has a significant economic and environmental impact. Annually, Grand Junction will reduce its energy budgets by 19 percent, water use by 1.1 million gallons, carbon dioxide emissions by 626 tons, nitrous oxide emissions by 1,304 pounds, and sulfur dioxide emissions by 1,095 pounds. Expected energy and operational savings will be more than \$1.2 million over the life of the contract.

## Leveraging energy savings, available funding and best practices

Under the performance contract, energy savings that result from facility upgrades pay for the improvements themselves. If the expected energy savings are not achieved, Johnson Controls will cut a check for the difference. The contract enables Grand Junction to divert funds that would typically be spent on energy bills and reinvest them into other community initiatives.

To leverage available funding, Johnson Controls gathered the necessary technical information and assisted the city with applications that resulted in approximately \$325,000 in grants and rebates from the local utility and the State

of Colorado. Additionally, Johnson Controls project management team achieved extra savings of \$170,000 during construction by re-bidding the electrical and mechanical work, and avoided expenses through scheduling and procurement best practices. And, the project was completed nearly one month early.

## Education is key to city's leadership, project success

Grand Junction understands that employee education and buy-in is critical to maximizing energy reduction and maintaining the city's leadership position in sustainability. Another goal of the CORE team is to promote and monitor waste reduction, energy and water conservation, alternative transportation, and pollution reduction and prevention in all city operations.

To accomplish this, the team worked with Johnson Controls to implement its Sustainable Energy Education & Communications (SEEC) program citywide. The SEEC program provides a complete package of training tools and modules designed to help change the way city employees think and act. The goal being to promote energy awareness and educate employees on sustainable actions, ultimately making them a part of the city's culture. "As employees become more efficient, it saves the city and taxpayers money, and the employees can benefit at home too," says Portner. "It's a great project for the city and the community."



A 5 kilowatt photovoltaic system was installed at the Visitors Center.

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**KATHY PORTNER**  
NEIGHBORHOOD SERVICES MANAGER  
CITY OF GRAND JUNCTION



Energy efficiency improvements at the Persigo Wastewater Treatment Plant will yield over \$23,000 in utility savings annually.

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