SHOWCASE PROJECT: SALT LAKE CITY’S PUBLIC SAFETY BUILDING

SOLUTION OVERVIEW
In 2014, the Salt Lake City Corporation completed the construction of new headquarters for the City police and fire departments, emergency operations center, and combined dispatch unit. The project was funded by a voter-approved bond and features an ultra-efficient design with the goal of achieving “net zero” energy use and carbon emissions through on-site building efficiency features and solar panels as well as the construction of an offsite, 1-megawatt solar farm associated with the Public Safety Building construction.

After the construction of the building and a year of operation, the Facilities Department conducted a review of the building’s operation in 2015 and determined that the building’s energy systems were operating according to original design specifications. However, the actual electrical and natural gas usage were above the estimates of the energy model developed during design. Thus, the building was not yet carbon net zero, with 383 metric tons of excess CO²e.

SECTOR TYPE
Local Government

LOCATION
Salt Lake City, Utah

PROJECT SIZE
175,000 sq. ft.

FINANCIAL OVERVIEW
$95,000

SOLUTIONS
Fault Detection and Diagnostics software performed continuous analysis of the HVAC system, which discovered some operating inefficiencies: simultaneous heating and cooling, over-ventilation of occupied space, and air handlers operating during unoccupied periods. The Facilities Department then developed energy conservation measures (ECMs), and conducted a retro-commissioning of the Public Safety Building.

The objective of the two ECMs was to ensure that the building systems were operating in a

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complementary fashion rather than in opposition. The financial payback on the implementation of the measures was realized almost immediately because the ECMs required only programming changes, which were done in-house.

- ECM-1 optimized air handlers, reducing the amount of outside air delivered to the individual temperature control zones.
- ECM-2 optimized scheduling for radiant floor heating/cooling control to reduce consumption overall and eliminate natural gas consumption during the summer months.

These two ECMs are reducing annual electricity and gas consumption by almost 300,000 kWh and 4,800 dekatherms (DTH), respectively. Read more about these ECMs in DOE’s Smart Energy Analytics Campaign case study.

OTHER BENEFITS
The project has improved energy performance, reduced utility bills, and improved the comfort of the City’s first responders. The entire project had a financial payback period of just two years, with cost savings accumulating as a net benefit thereafter. The energy improvements are resulting in annual reductions of 468 metric tons of carbon dioxide emissions, which is equivalent to 100 cars removed from the roads. The GHG reduction is greater than the excess CO\textsubscript{2}e produced by the building in 2015. The building has received LEED® Platinum certification, achieved an ENERGY STAR® score of 100, and has now met its carbon net zero goal.
### Annual Energy Use
(Source EUI)

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<tr>
<td>Energy Use</td>
<td>210 kBtu/sq. ft.</td>
<td>143 kBtu/sq. ft.</td>
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**Energy Savings**
32%

### Annual Energy Cost

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<td>Cost</td>
<td>$252,000</td>
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**Cost Savings**
$68,000