



CASE STUDY
COLORADO

Denver Housing Authority: Energy Efficiency Overhaul



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CHRIS JEDD

Portfolio Energy Manager, Denver Housing Authority

At the Denver Housing Authority (DHA), quality, affordable housing and a vibrant living environment are the priorities. You won’t find the words “efficiency” and “sustainability” in the mission statement, but thanks to a newly completed energy and environmental initiative, they’re now built right into the many properties in the DHA portfolio.

DHA had previously gone through an efficiency retrofit that upgraded some simple things: lighting, low-flow water fixtures, boilers and hot water heaters to name a few. But this time, they wanted more control over which items were chosen for their properties. They opted for a self-managed energy performance contract and chose 12 buildings to retrofit. It would take longer and require the buy-in from residents, maintenance staff and approval from the U.S. Department of Housing and Urban Development, but they were willing to put in the extra work to do it right.

Collaborative Effort

The Denver Housing Authority started by partnering with an energy and resource efficiency consulting firm to audit the properties and make recommendations, a consulting firm to help navigate the economics and HUD approval and Energy Outreach Colorado to help determine rebates and incentives available through Xcel Energy.

Before any decisions were made, they invited the maintenance supervisors and staff to offer input on things like furnace models, thermostat preferences and what would make the most sense when it came time for residents to operate equipment or the staff to maintain it.

Equally important was gathering feedback from the residents.

“We wanted to include them so they would feel more ownership,” says Chris Jedd, Portfolio Energy Manager at Denver Housing Authority, whose job was created to help DHA manage the process. “We asked them what they liked or didn’t like so ultimately it was easier for them to accept the changes because they had a voice.”

Comfort and Cost Savings Achieved

Many of the proposed changes were small but on a grand scale. The program included 2,500 existing DHA homes throughout the city in a combination of single-family homes, multi-family structures and high rises. Jedd and his team had two goals in mind: increase residential comfort and significantly decrease annual operating costs.

FINANCIAL SNAPSHOT

Project	Upgrade efficiency measures in 12 residential properties including refrigerators, insulation, boilers, windows, furnaces and more.
Xcel Energy rebates	\$2.4 million
Tax credit	\$35,000
Cost after rebates, loans and incentives	\$9.1 million
Estimated annual savings	<ul style="list-style-type: none"> • 2,193,000 kWh • 194,000 therms • 20,000,000 gallons of water

The various energy and water efficiency upgrades included:

- Furnaces
- Water heaters
- Ceiling fans
- Thermostats
- Common area lighting
- Upgrades to the central plant where operating systems reside
- Refrigerators
- Unit lighting
- Attic insulation
- Windows
- Irrigation systems

Each unit got only what it needed so not all retrofits were uniform. In some cases, upgrades were completed strictly for the comfort of residents. Windows in one property didn't need replacing, so weather stripping and caulking were added to significantly increase the comfort for elderly residents there. Upgraded attic insulation in another property meant a capital cost with a smaller return on investment than other measures, but it reduced draftiness and made a big difference for the occupants.

Getting it all done was no small task. The planning, approvals and implementation took roughly two years and the total cost was over \$11 million. But everyone involved agrees that the result is well worth the effort.

"The residents are more comfortable, we have new equipment in the majority of our portfolio, and we'll recoup the cost in energy savings," explains Jedd.

New and Improved

To ensure actual savings match the estimates, the engineering firm performs weekly verification and measurement checks. They can determine how much money is being saved, which DHA can put back into other projects.

The team also added a few new pieces of technology, helping Jedd know in real time if anything's wrong.

"The information updates every 15 minutes so if the boiler shuts down, I'll get an email from the system so I can better manage it before it affects the residents," says Jedd.

Finally, they educated the residents, staff and even subcontractors about the new equipment and how to operate it. Jedd wanted to make sure residents understood their part in energy efficiency and that maintenance staff knew how to operate everything to minimize inefficiencies.

The Future of Low Income Energy Solutions

Jedd is already looking at the next things he'd like to implement, using some of the Xcel Energy rebate dollars and money he's already saved. He plans to upgrade more windows, insulation and irrigation systems as well as installing smart meters in some properties.

It's been such a success, that Jedd is now sharing the DHA story with other Housing Authorities across the country. He loves to point out the local benefits, from job creation in hiring local teams and subcontractors to the energy and cost savings. He wants to show them that with the right team, incentives, and determination, they, too, can make the same big impact.

For more on the Denver Housing Authority project or Xcel Energy's energy efficiency programs, visit denverhousing.org or ResponsibleByNature.com.



By the Numbers: Items Replaced

850
refrigerators

1,300
furnaces

4
irrigation systems

1,300
attics insulated

4
central plant upgrades

