



Denver Metro Chamber of Commerce Leading by Example

1445 Market Street is a five-story commercial office building with a two-story below-ground parking garage located in the Lower Downtown Historic District of Denver. Constructed in 1985, the building is owned by the Denver Metro Chamber of Commerce (Chamber) and Junior Achievement, and managed by the Chamber. From 2010 to 2014, they undertook building improvements, including energy efficiency upgrades that improved the ENERGY STAR score of the building from 45 to 80.



Measuring Energy Performance

Recognizing the potential to improve the building’s energy and financial performance, the Chamber worked with American Mechanical Services to perform an energy audit and benchmark the building’s energy performance utilizing the ENERGY STAR Portfolio Manager Software.

Initial benchmarking in 2010 returned a baseline ENERGY STAR score of 45 — below the national average and indicating that changes to the building’s controls and systems would likely lead to large energy savings. The audit report provided context as to how the building was consuming energy and ways that the building could improve its operations and systems. Based on recommendations from the audit report, a number of energy-saving projects have been prioritized and implemented, with more to follow in the near future.

Building System	Strategy
HVAC	Replacement of rooftop air handling unit
	Replacement of boiler
	Advanced temperature zone controls
Lighting	LED Bulbs
	Fixtures
	Occupancy Sensors
	Daylighting Controls
Envelope	New window glazing, caulking, and gaskets
Office Equipment	Replacement of old laptops and printers with ENERGY STAR models.
Active Design	Attractive and visible stairwell to reduce elevator use.

Energy Efficiency Upgrades

2012 – Rooftop Air Handling Unit Replacement

Replacement of the building’s original, undersized, inefficient, 90-ton rooftop unit at the end of its service life. The newly installed 105-ton RTU unit is 40 percent more efficient and has resulted in \$15,000 in savings annually.

2013 – Boiler Replacement

The original single boiler was manually controlled and only operated at one temperature. The new modular boiler plant consists of two 87 percent efficient 1 MMBTU boilers with 5:1 turndowns and reset controls/outside air cutouts. As a result, natural gas usage has been reduced by 60 percent.

2014 – Advanced Temperature Zone Controls

Pneumatic zone controls were replaced with digital controls, and electronic actuator level controls linked to the building plant equipment to allow for a number of other advanced control strategies.

2014 – Energy Lights and Controls

As part of a larger interior remodel all lighting was replaced with LED can lights, T5 indirect fixtures, occupancy sensors and daylighting controls, significantly reducing lighting intensity while maintaining appropriate lighting levels.

“Whether finding sustainable ways to power our state or our economy, being green is a part of doing business in Colorado. When our equipment exceeded its lifespan, it made sense to move in an energy efficient direction. We live in a state on the forefront of renewable energy, with local companies and education and research institutions setting a high bar for sustainability. Sustaining Colorado’s resources and vitality for future generations, while at the same time saving money, just makes sense.”

- Holli Riebel, COO, Denver Metro Chamber of Commerce

Financial Costs and Savings

The mechanical HVAC equipment was at the end of its serviceable life, and would have cost \$300,000 to replace with standard equipment. After \$17,371 in Xcel Energy rebates, the total cost of the energy efficient mechanical retrofit was \$580,000. The projected utility savings in electricity and gas is \$40,000 annually, resulting in payback of the additional cost of energy efficient equipment over standard equipment of seven years.

Additional Efforts

- A renovated stairwell to encourage physical health and save elevator energy.
- Replacement of older laptops and monitors with ENERGY STAR-rated equipment and reduced to access to personal printers.
- Caulking, glazing and new gaskets on exterior windows.
- Installation of a rooftop wind turbine and 10 solar panels.

Energy Efficiency Programs

- Founding an employee green team and engaging building tenants
- Hosting an Xcel Energy rebate program through the Denver Metro Small Business Development Center
- Awarding a Green Business of the Year at its annual Business Awards to recognize outstanding sustainability efforts by member companies
- Participating in sustainability events and conferences, including the Colorado Energy Expo led by our affiliate, the Colorado Energy Coalition
- Partnering with the Denver City Energy Project for small business community outreach education

Results and Next Steps

By implementing the above measures the Chamber building has elevated its ENERGY STAR score from 45 to 80 and reduced energy consumption by 30 percent over its 2010 baseline, with more savings on the way as construction concludes. The Chamber will continue to track its energy performance and make every effort to continue to invest in energy-efficient building systems.

Mechanical HVAC Equipment Retrofit Payback

Total Cost	Xcel Rebate	Post Rebate Cost	Standard Price of Replacing Equipment	Additional Cost for Efficient Equipment	Projected Annual Energy Savings (\$)	Payback Period (Yrs.)
597,300	17,300	580,000	300,000	280,000	40,000	7

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