

Spire

CASE STUDY

Built and Managed For Energy Efficiency



DENVER City Energy Project

A program of the City & County of Denver

Spire is a 42 floor, 496 unit condominium built in 2009 on the site of a surface parking lot. It includes ground floor commercial space, 8 stories of structured parking, and at 498 feet, is Denver's second tallest residential structure. The building was designed to meet LEED NC certification, and includes sustainable features such as low flow water fixtures, single stream recycling, the purchase of renewable energy credits, and energy efficient building envelope, HVAC, and lighting systems. Its integrated electric metering system provides its owners and operators with detailed energy performance information, enabling energy efficient operational and capital improvement decisions. Its progressive management structure ensures that the building will remain on the forefront of energy performance even as it ages. The building was developed and designed by Denver's Nichols Partnership, RNL Design, and JE Dunn Construction, owned by the Spire Owners Association, and managed by Centennial Realty Advisors.



Energy Efficient Features

Building Envelope	1" Low E Insulated Windows
	Insulation: High r-value
HVAC	Heat Exchangers
	RCU (cooling towers)
	AC - Water Source Heat Pumps
Lighting	Controls
	Ballasts/Bulbs
Energy Sourcing	100% renewable electricity
	Xcel District Steam

Energy Management

Spire's energy management goal is to perform at its designed level of energy efficiency. From the moment a building is occupied, its systems are constantly being used and wearing down, and new, more efficient technologies come to market. Proper maintenance and timely replacement of building components have allowed Spire's management to maintain a high level of energy efficiency.

Energy Management System

The EMS system allows the HVAC operating system to maintain peak performance. A series of sensors and servers send alarms when equipment is operating outside of its set optimal parameters. Variable Frequency Drives help optimize energy usage by modulating motor speed of condenser water loop pumps, cooling towers, and make up air unit.

Sub-metering

Spire units are sub-metered; enabling Spire residents to receive a monthly bill for their unit's actual energy usage as well as graphics charting their usage over time. This allows residents the opportunity to receive the savings if they are more energy efficient in their own unit. All the sub-meters are integrated into a computer based utility metering system.

ENERGY STAR Portfolio Manager

Spire's building management uses the ENERGY STAR Portfolio Manager tool to track general energy performance over time as compared with peer buildings. Spire currently has a score of 83 out of 100, making the building eligible for ENERGY STAR certification. Spire won 3 Most Efficient Multifamily Building awards from Denver's Watts to Water Program over the past 3 years for their high ENERGY STAR scores.

Post Construction Energy Upgrades

The Spire's energy monitoring system has helped management identify and implement cost effective energy efficiency retrofits, including:

Parking Garage Lighting

In 2014, the Spire replaced all 269 of the 175 Watt Metal-Halide lighting fixtures in the parking garage with 40 Watt LED fixtures.

Parking Garage Lighting Retrofit Estimate					
Annual Electricity Savings	Maintenance Cost Savings	Project Cost (\$)	Rebates	Net Project Cost	Net Payback
379,367 kW \$28,271	\$4,278/yr	\$96,375	\$47,209	\$49,166	1.51 yrs

Electric Vehicle Charging Stations

In 2013, the State of Colorado enacted a law requiring HOAs's to reasonably accommodate owners who desired Electric Vehicle (EV) charging stations at their private parking spaces. Spire residents requested stations, and building management commissioned a feasibility study to upgrade its electrical infrastructure to charge cars. Spire was awarded a Charge Ahead Colorado Grant from the Regional Air Quality Council to assist in the cost of upgrading several spaces. Thanks to the integrated metering system, electricity from 12 EV charging stations (and counting) is linked directly to owner's condominium electric usage, allowing owners to separately track their transportation and home usage.

Future Upgrades

The Spire Owners Association members share responsibility to maintain the building's common elements. The replacement of commonly owned building components at the end of their functional life is financed through a reserve fund funded by annual assessments.

The Spire's complete energy efficiency approach takes into account all of the factors important to its long term energy performance. It was built for efficiency, has a plan to continuously upgrade its building to remain efficient, has a responsive management team with the appropriate tools to analyze the building, and makes residents energy usage transparent to inspire behavior change.

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