BOSTON Green Ribbon COMMISSION

Profiles in Climate Action

BUILDINGS THAT TALK

HOW SENSOR DATA LOWERS CARBON EMISSIONS AND ENERGY COSTS

A member of the Boston Green Ribbon Commission's Commercial Real Estate Working Group, AvalonBay Communities manages over 280 multi-family properties throughout the country, and is committed to building sustainable communities that minimize their carbon footprint. AvalonBay had made energy efficiency investments in its portfolio for many years, with good results. But it wasn't until the company embedded real-time data monitors in its buildings - and asked staff and tenants to pay attention to what the buildings were telling them - that AvalonBay leaders felt they had cracked the code on energy and water use reduction.

24/7 DATA MONITORING:
An EKG on the Building

Every building has a unique data signature that can be adjusted, primarily by modifying the behavior of its residents and managers. Energy Technology Savings (ETS) outfitted the New York properties with a network of sensors that provide real-time data on energy and equipment. Through 24/7 monitoring, the sensors allowed AvalonBay to identify patterns, uncover operational issues and understand performance trends. This method is akin to placing an EKG on the building.

With commercial and residential buildings accounting for 40 percent of total US energy use, AvalonBay has long invested in a range of cutting-edge measures that reduce energy use and emissions and lower residents' monthly utility bills across the company's portfolio of buildings. These have included features such as programmable thermostats, LED lighting, energy-efficient windows, EnergyStar appliances, and high-efficiency fixtures. After retrofitting over 100 of its communities, however, AvalonBay realized that changing the mindsets and behaviors of residents and building managers and aligning those behaviors to demand response and efficiency programs was the key to achieving true sustainability.

AIMING HIGHER

In 2015, AvalonBay started a pilot program in New York City to introduce new methods of utility demand management that align with its goal of a 15 percent portfolio-wide reduction of energy and water use intensity by 2020. Encompassing 11 mid- and high-rise properties, the program's first challenge was to determine how much energy and water the buildings were consuming. Because of building age or other factors, accurate data was not available - and, in some instances, the company found it couldn't collect any data at all.

AvalonBay partnered with New Jersey-based Energy Technology Savings (ETS), which used smart sensors to gather data on AvalonBay's building operations to help uncover any potential energy savings hiding in the building. Once data was properly analyzed, AvalonBay was able to implement more innovative, right-sized ways to reduce energy demand overall.

WHEN BUILDINGS TALK: DEMAND MANAGEMENT & SMART METERING

"ETS's 'Internet of Things' technology platform allowed the building to speak to us and for property managers to monitor several places at one time," said Mark Delisi, Vice President of Corporate Responsibility at AvalonBay. "Now property managers are able to react in real-time and adjust building behavior to align with demand response and increase efficiency, as well as get ahead of possible system malfunctions to prevent a crisis."

As a result of the data, AvalonBay installed its largest cogeneration system ever at the Avalon Fort Greene community in Brooklyn in 2016. While 2016 showed a significant decrease in the amount of energy the building used per degree day, the company understood that optimizing the combined heat and power system would help reduce these values even further. Although overall electricity use in New York City continues to trend upwards, AvalonBay Fort Greene has been trending downwards since installation of the cogeneration plant. The system is projected to save AvalonBay $219,000 in annual energy costs and reduce greenhouse gas emissions by 350 metric tons of CO2 annually.

WHAT'S NEXT?

AvalonBay is expanding this program into the Boston area, starting at Avalon North Station, one of the largest apartment developments in the city. In Boston, the company also plans to expand into solar, energy storage and battery technology, working to solve renewable energy intermittency challenges. AvalonBay plans to implement a portfolio-wide renewable strategy over the next three years.

With Zero Net Carbon also an important step for high-performance building standards, AvalonBay is funding a study in 2018 to evaluate its goals in this realm for the near future.

"We know that the technology that enables our buildings to 'speak' to us is only improving and becoming less costly," said Delisi. "When you combine that with the advances in battery technology, the move to more renewable energy and a smarter overall energy procurement strategy, you have a very powerful sustainability innovation platform that will reap significant financial and environmental rewards to our company and the communities in which we do business."

Avalon Bay Communities, North Station Boston

To make informed investment and policy decisions regarding climate change risks, it is vital for the commercial real estate sector to have good data on the payback for adaptation and mitigation efforts.

The Green Ribbon Commission Commercial Real Estate Working Group

The CREWG comprises leading Boston property owners who accelerate momentum of Boston's commercial real estate organizations to help the City of Boston meet the goals of its Climate Action Plan.

Scott Kinter

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The Boston Green Ribbon Commission is a group of business, institutional, and civic leaders in Boston working to develop shared strategies for fighting climate change in coordination with the City's Climate Action Plan. Learn more at www.greenribbomcommission.org.