

Hybrid Heat Optimization

Peak electricity usage will be on the coldest days of the winter as the rate of electrification accelerates

Hybrid Heat Optimization is a Critical Strategy in the Fight Against Climate Change

Building electrification is one of the most important strategies for reducing carbon emissions. In the quest to get to net-zero buildings by 2050, multifamily owners are racing to replace appliances with more modern, electric models and to replace fossil fuel heating with new, highly efficient systems, including heat pumps that will reduce emissions and make buildings more comfortable for residents.

There's no doubt that electrification can deliver long term savings for owners and will reduce carbon emissions. But as the built environment moves to "electrify everything", especially building heating, there will be strain on the grid. The grid will experience its peak electricity usage not during the hottest days of the summer, but on a few of the coldest days of winter - typically seven days, or 2% of the year - when it may not be able to generate or supply sufficient electricity to meet demand.

Embue Hybrid Heat Optimization

Embue Hybrid Heat Optimization boosts overall building performance in existing buildings with fossil fuel systems by enabling the building owner to use a combination of heat pumps and fossil fuel systems.

Through digital twin technology, Embue creates digital replicas of real-world buildings to develop a comprehensive understanding of how the building will respond to changes in weather and resident activity. In the case of Hybrid Heat Optimization, Embue uses a digital twin model to predictably switch from electric to gas heat, even on a unit-by-unit basis.

For example, on the coldest days of the year Embue will switch from electric to fossil fuel heat based on energy prices or demand response program participation. Switching between systems can help avoid overloading the grid, and allows for five times the number of heat pumps to be installed, saving even more on energy costs

Embue can use several different criteria to determine the best fuel source, including:

Indoor and outdoor temperatures. As temperatures drop, heat pumps operate less efficiently and have to work harder. Switching to gas based on dynamic equipment performance (rather than a fixed outdoor temperature threshold) can reduce costs and improve comfort..

Energy prices. Energy prices fluctuate based on availability, local fuel costs and pricing regulations. Embue can direct the system to use the lower cost fuel source.

Real time carbon footprint. While heat pumps generally emit less greenhouse gas than natural gas or oil heating, during certain times of the year there are regions of the US where they can actually generate more due to the electricity generation mix (fossil fuel/renewables/nuclear). Embue can lower the property's carbon footprint by taking into account the electrical mix and heat pump efficiency at lower temperatures to meet carbon footprint targets.

Demand response signals during a winter peak event. Buildings participating in demand response programs can reduce electricity costs or even make money by reducing demand for electricity during times of peak usage.



Coleman House 2Life Communities

2Life Communities, a Boston-based leader in senior affordable housing, uses Embue Hybrid Heat Optimization to improve energy efficiency, to lower costs and to reduce emissions.

At 2Life's Coleman House, a 146-unit building in Newton, MA, Embue was installed as part of an initiative to lower carbon emissions where "through the wall" air conditioning units were removed and the building envelope improved including the installation of new windows. A Daikin variable refrigerant volume (VRV) central heat pump system was also installed to provide both heating and cooling. Because the project was completed while residents occupied the building, 2Life kept the existing gas-fired hot water baseboard heat and then decided to use Embue's Hybrid Heat Optimization solution to dynamically manage both systems, running the gas heat only on the coldest days of the year. Typically, the gas system will run for approximately seven days per year, or 2% of the time.

Embue can decide and control which energy source is used for heating based on several different criteria, including:

- Indoor and outdoor temperatures
- Energy prices
- Real time carbon footprint
- Demand response signals during a winter peak event

Embue decides and controls which energy source is used for heating based on several different criteria, including indoor and outdoor temperatures, energy prices, carbon footprint and demand response signals during a winter peak event.



About Embue

Embue's smart building platform for multifamily portfolios provides whole building intelligence, automation and control to give owners and managers visibility and control of every apartment, common space and piece of equipment in the building. Embue provides end-to-end insight and control of the entire property, monitoring for resident discomfort and harmful conditions, like water leaks and high humidity, and makes the property more efficient to manage through a dashboard that provides control, automation and insight property-wide.

With Embue, apartment buildings can become 25% more energy and carbon efficient and staff 30X more efficient on key tasks. Embue is installed or under contract in 7,000+ units at major national portfolios, with a rapidly growing footprint in 10 states and is head-quartered in Worcester, Mass.

Interested in learning more about Embue?

Contact us today for a customized building analysis and recommendation on how Embue can work with you to deliver cost savings and comfort.



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