Mosaic Gardens New Construction, Low-Income Multifamily ZNE

OVERVIEW

What was the project's purpose?

Mosaic Gardens, located in Pomona, California, is a new residential complex that has demonstrated how innovative Zero Net Energy (ZNE) measures and emerging DR technology can be effectively adopted in new construction. The low-income multi-family residential development consists of forty-six apartment units that vary in size from one to three bedrooms. This facility serves tenants that are low income, with half the units designated for displaced residents.

TECHNOLOGY

What technology was used for this project?

An opportunity for DR research presented itself to demonstrate a new type of HVAC control platform for the building. A mesh network system utilizing wireless state-of-the-art smart communicating thermostats was installed in each apartment. A wireless gateway was provided in the main facility area to route the communications signals that provide both comfort and additional control and monitoring of the individual all-electric heat pumps.

The communication between the gateway and each of the thermostats is part of a secure "peer-to-peer" wireless mesh network. Tenants do not need to have their own internet because the thermostat portal is served by a common internet connection in the building. Individual dashboards for building tenants have advanced features and allow customization to reduce energy use.

M&V

What data was collected and for what purposes?

The new wireless thermostats are collecting data for current and future research purposes. At a later date these thermostats could be programmed to test demand response capabilities by controlling heat pump electrical draw following ADR signals. For now, these thermostats are collecting valuable data to inform future multi-family ZNE design.

RESULTS

What was concluded from this project?

The advanced mesh network system provides multiple benefits in being able to remotely monitor a large number of heat pump systems, delivers automated alarms warning of spaces out of temperature range, and assists management and technicians to respond quickly to any maintenance issues. This project did not advance to the stage at which demand response participation was an option. Nonetheless, the thermostats have been installed and may be used for research at a later date. They can be programmed to load shifting mode to reduce electricity demand in response to an OpenADR signal.