



BEAVERTON PUBLIC SAFETY CENTER ADVANCES CARBON REDUCTION AND RESILIENCY GOALS

SOLAR MICROGRID IS A KEY FEATURE IN THE BUILDING'S PATH TO NET ZERO

When Beaverton set out to build a larger, more functional home for their Police and Emergency Management departments, the city had several targets. As a public building, the facility needed to meet a state mandate for investments in green energy technology and support Beaverton's climate action plan, which calls for a 100% reduction in community greenhouse gas emissions by 2050. Above all, as the city's emergency operations center, it needed to be energy resilient and remain operational even during power outages or emergencies such as an earthquake.

The three-story, 72,000-square-foot Beaverton Public Safety Center hits all those targets thanks to 873 solar panels, battery storage and a highly energy-efficient design that puts the building well on the path to net zero.

A notable feature of this project is that the 331.8-kilowatt solar array—generating enough clean energy to meet 40% of the building's needs—joins with the battery storage and a diesel standby generator to form a microgrid. This is the first solar plus storage microgrid to serve an emergency operations center in Oregon.

The microgrid benefits the community by providing both critical energy resiliency for the safety center as well as interactive services for the larger electrical grid. Day in and day out, Portland General Electric can draw on solar energy stored in the battery to supply clean energy to the grid during peak periods. But if there's an outage, earthquake or other disruption, the building is automatically served by the stored solar power.



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As a police facility, we're operating 24/7, and so we need to make sure we have power all the time. The battery storage gives us a green option as a backup so we're able to continue providing services to the community if there's a power outage.

Eric Oathes, captain,
Beaverton Police

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“We decided if we could make it more of a green building and create our own solar power rather than burning more fossil fuels—and provide extra energy back to the grid that PGE can use when demand is high—it just made sense,” said Eric Oathes, captain, Beaverton Police, who served as project manager for the building's construction.

The solar-powered microgrid proved its value almost immediately.

“In September 2020, right after we moved in, there was a big thunderstorm that came through. We lost a bunch of power throughout Beaverton, but our emergency backup system kicked right in,” said Oathes.

The microgrid is also working seamlessly to help serve the larger community.

“We have dispatched that battery an average of 10 to 20 times a month as a resource to help keep energy flowing smoothly on the grid. And nobody ever knows the difference. You never see a disturbance. You never see the lights flicker. It just does what it needs to do,” said Darren Murtaugh, senior manager, PGE Grid Edge Solutions.

Designed to use less energy from the start

Along with the solar array, the building includes features that make it 70% more energy efficient than the national standard for buildings of this type, which saves on monthly energy costs and aligns with climate action goals. To achieve that level of savings, the City participated in Energy Trust's Path to Net Zero, which includes incentives and Energy Trust staff involvement from early design through construction. Technical assistance included energy modeling and daylighting studies to identify the best solutions to reach energy-efficiency goals.

A high-efficiency building envelope, LED lighting and controls, and daylighting are some of the features that combine to deliver outstanding energy performance and a comfortable workspace. To maximize savings on heating, cooling and ventilation, the building uses a variable refrigerant flow system paired with a dedicated outdoor air system, radiant floors, chilled beams that circulate cooled air as the primary system and a backup high-efficiency boiler as the secondary system.

Collaboration strengthens the community

The City will apply energy cost savings achieved at the building to the center's operating budget, enabling police and emergency services to better serve the community.

Financial help from Energy Trust and PGE helped the project pencil out for Beaverton. Energy Trust incentives totaling \$211,000 helped cover part of the costs for the early design studies as well as the solar project.

"I love the building. It has a nice open feeling compared to our previous building that was small and confined. It's very bright because of the windows and daylighting," said Oathes. "And it was designed around the everyday operations of a police officer. About 90% of what they need to do—write reports, evidence processing, custody processing—is right there as they come in the back doors from the secured lot."

PROJECT-AT-A-GLANCE

Overview

- Beaverton Public Safety Center
- Houses Beaverton Police and Emergency Management Department
- 72,000 square feet

Renewable and energy-efficient features

- 331.8 kW solar array
- 250kW/1MWhr Battery storage
- High-performance envelope
- Natural ventilation
- Daylighting
- LED lighting and controls
- Chilled beams
- Radiant floor
- High-efficiency HVAC

Project benefits

- 70% more efficient than the national standard for buildings of this type
- Solar offsets 40% of energy needs
- Energy resilience for public safety center
- Lower energy expenses
- Microgrid provides interactive utility grid services
- Carbon emissions reduction = 1,235,043 lbs
- Exceeds Oregon's 1.5% green energy technology requirement

Incentives and savings

- \$171,045 Energy Trust Path to Net Zero incentives
- \$40,000 Energy Trust solar incentives
- \$57,200 estimated annual energy cost savings (\$26,100 from Path to Net Zero, \$31,100 from solar)
- PGE support totaled about \$1.5 million including a grant from the PGE Renewable Development Fund, which is supported by PGE Green FutureSM renewable energy customers

Project team

- A&R Solar, Energy Trust trade ally
- Shiels Oblatz Johnsen
- FFA Architecture & Interiors
- Skanska Construction



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