

WATER HEATER CASE STUDY

Mid-rise multifamily makes a sustainable splash



© Splash Apartments.

High-performance central heat pump water heaters play key role in multifamily building's award-winning efficient design.

Built with a vision merging livability and sustainability, Portland's eight-story, 219-unit Splash Apartments building opened its doors in 2024. Spread across two towers connected by multiple skybridges, the Splash Apartments stand as a monument to innovative and energy-efficient design with key features including ENERGY STAR® appliances, packaged terminal heat pumps, and one of the nation's most efficient water-heating systems.

Housed in the complex's underground parking garage, the building's central heat pump water heater (CHPWH) reduces overall energy use intensity (EUI) by half, playing a key role in the project's ambitions to achieve some of the industry's most prestigious accolades, including Earth Advantage Platinum Certification and the U.S. Department of Energy's (DOE's) Made in America Grid Integrated Commercial HPWH Systems (MAGIC HPWH) program. With many more achievements on the horizon, this groundbreaking CHPWH has already made Northwest efficiency history by playing a key role in the project receiving the largest incentive ever provided by Energy Trust of Oregon.

All the benefits of heat pump water heating, without the complexity.

By using technology that moves heat from one place to another instead of generating heat directly, heat pump water heaters significantly reduce the energy required to meet a building's hot water demand. However, until the

Project Overview



Building type:
Multifamily building



Location:
Portland, OR



Year Built:
2024



Project floor area:
310,000 sq. ft.



Energy efficiency:
**Earth Advantage
Multifamily Platinum
Certification**



Reduction in
whole-building EUI:
50%¹

innovation of CHPWHs, the technology's complex design and installation requirements posed a barrier to widespread adoption. CHPWHs break this barrier by serving the building's total hot water needs in one central plant. By simplifying design and installation, CHPWHs bring the enormous efficiency benefits of heat pump water heaters to larger commercial applications like the Splash Apartments and its more than 200 units.

With pre-made sizes based on storage capacity, packaged CHPWHs reduce the need for plumbing and electrical site work, which minimizes complexity for designers, installers, and maintenance staff, while offering flexibility to meet unique site conditions. By streamlining the water heating equipment to only pumps, compressors, and fans – as opposed to the constant and wasteful heating of coils – the CHPWH allowed the Splash Apartment to move forward with an all-electric system that uses significantly less energy than traditional water heaters, while easily meeting the buildings substantial hot water demand.

Incorporating the latest efficient technology provides additional benefits beyond efficiency. Serving as a thermal battery that stores excess hot water, the CHPWH can be tapped into to alleviate grid pressure during times of peak energy. This capability offers critical grid flexibility to help the region avoid blackouts as energy demand increases in the years to come.

When Northwest sustainability makes a national splash.

The innovative Splash Apartments project immediately grabbed national attention when it won a prestigious, conditional award from the DOE's New Buildings Institute. The award comes from a three-year pilot known as MAGIC HPWHs and is administered by the DOE's Buildings Energy Efficiency Frontiers & Innovation Technologies (BENEFIT) program. With a goal of advancing American-made CHPWH systems in the market, the BENEFIT program seeks to bring the benefits of all-electric CHPWH systems like the one beneath Splash Apartments to commercial buildings across the country.

In addition to this national attention, the Splash Apartments is receiving profound regional support as well. While Energy Trust of Oregon supported the project with incentives, Bonneville Power Administration is also backing the project by sponsoring a one-year monitoring program to track system performance, water temperature, flow, and overall usage.

System Summary

3x Nyle Reverse Cycle Chillers

4x storage tanks

1x electric tank

1,440 gallon/hour recovery rate

50% reduction in overall building EUI¹



¹ Compared to a similarly sized multifamily building using standard water heating.