



Case Study

Multi-Family Residential Building

Seattle, WA



Application

60-unit low-rise multi-family residential building

Location

Seattle, WA

Project Completion

2018. (The development was built in 1968. The hot water system was overhauled in 2018.)

Overview

Elizabeth James House is a 4-story apartment building subsidized by HUD which provides low cost housing to eligible seniors in Seattle, WA. The all-electric building was constructed in 1968 and offers 60 apartments, all 1-bedroom with single occupancy. The building underwent a redesign of its hot water system in 2018.

Original Equipment Replaced

The existing system that was replaced was not original. It was comprised of three relatively new 39 kW instantaneous electric resistance water heaters, three 120-gallon hot water storage tanks, a primary water heater pump, a building hot water circulation pump, and an expansion tank. The three electric water heaters were piped in parallel to three storage tanks piped in series.

New Equipment Installed

The new system included four 15,000 BtuH Sanden Heat Pump Water Heaters (3rd Generation Model GUS-A45HPA) and re-used the three existing storage tanks and main hot water pump and circulation pump. The existing electric water heaters were left in place as a backup. A new 175-gallon storage tank and a thermostatic tempering valve were added.



Result

The HPWH System produced sufficient hot water to meet the daily demand of 20 gallons/day/apartment (single occupant per apartment) with a total electricity usage of 68 kWh/day for all 4 heat pumps. The referenced report cites a Coefficient of Performance (COP) for the new system of 3.3, three times more efficient than the previous ERWH boiler system which it replaced.

Reference

See "[CO2 Heat Pump Water Heater Multifamily Retrofit: Elizabeth James House](#)" by Adria Banks, Colin Grist and Jon Heller of Ecotope Inc.

Disclaimer

This case study is intended to provide an example of an application of ECO₂ Systems LLC products. Nothing in the referenced documents should be construed as an endorsement of any ECO₂ Systems LLC products by the authors, Ecotope, Inc, the Washington State University Energy Program or the Bonneville Power Administration.