

High Performance, High Capacity (HPHC) Heat Pump Research Project

As of: February 2023

Research Summary Overview

- Goal – identify equipment which significantly reduces the use of electric resistance back up heat across all three heating zones
 - Improved performance in cold climates
 - Both energy savings and capacity benefits (in winter and summer)
- During 2021 – 2022, BPA signed cooperative agreements with six utilities including Tacoma, SNOPUD, Inland, Central Electric, Oregon Trail and Glacier Electric, pending Benton REA
 - Goal is to test the equipment across all three heating and cooling zones
- Project scope has expanded to include both **central ducted** and **whole home ductless** units
- Worked with EE Low Income Program Manager to offer Blackfeet Tribal Housing Authority a grant to install 2 high performance for DHP units in some of the coldest temperatures in the BPA territory (Babb, MT)

Research Team

- Project is funded by BPA Energy Efficiency Engineering Emerging Tech Program.
- Research team is lead by Robert Weber, BPA Residential Engineering Tech Lead; and Tony Koch, BPA Distribution Engineering and Metering Tech Lead.
- Project technical support provided through WSU Energy Program included the following research leads:
 - Ben Larson, Larson Energy Research
 - John Bush, OTS Energy
 - Bob Davis, Ecotope
 - Erin Connor, Keel Energy

Research Status as of February 2023

- Six utilities are currently participating in the research.
- Completed 26 home audits including 7 in Blackfeet Tribal Housing Authority territory.
- 19 homes are currently being monitored

Next Steps

- Targeting 30 – 40 houses instrumented by Oct 2023.
- Targeting installs in Heating Zones 2 and 3 to test equipment performance in the coldest and hottest temps in the BPA service area, in WA, OR and MT
- Expanding equipment selection to include a broader variety of heat pump manufacturers
- Installs will end by the end of Fall 2023 in order to capture one full year of heating and cooling data
- Project slated to end in the fall of 2024 with all metering equipment removed by Dec. 2024.
- Research report will be completed in 2025.