

Evaluating Demand Response Capabilities of Connected Variable Capacity Heat Pumps

1. Overview

This study is testing whether variable speeds of heat pump compressors and fans can improve comfort and overall performance as well as provide an improved resource for demand response.

The primary research objective is to conduct shed events with and without pre-cooling or pre-heating strategies combined with response varying levels of HVAC capacity limiting; and to demonstrate functional capabilities of variable capacity systems for demand response.

Potential research questions include:

- Can variable capacity systems respond more effectively to demand response signals compared to other types of HVAC equipment?
- How is customer comfort impacted during demand response events?
- Can the duration of a demand response event be extended prior to customer opt-out?
- Can demand response programs tailored to variable capacity systems result in higher levels of program adoption by customers given system features that may help overcome typical demand response program enrollment barriers?

2. Collaboration

The progress and results will be shared with other CA IOUs ET-DR Leads.

3. Status

The contract with the vendor was executed in Q4 2023. Use cases, metrics and functional testing protocol are under development with manufacturer collaboration.

4. Next Steps

The project is expected to continue thru 2025. Upon completion, the final report will be published to the ETCC web site for public review and reference.