



GTI ENERGY

solutions that transform



Market Transformation through Collaboration: Advancing Heat Pump Adoption in the Midwest

Midwest Energy Solutions Conference

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GTI Energy

Gas Heat Pumps

What is a Gas Heat Pump?

- Just like an electric heat pump, it sits outside and extracts heat from the outside air.
- The difference, it uses heat instead of an electric compressor to drive process

Why do we need Gas Heat Pumps?

- *Best-in-class operating efficiency*
 - Condensing furnace is 95-98 AFUE vs GHP is 140 AFUE
 - GTI Energy analysis shows 30%+ therm savings possible (space and water heat)
- Systems operate during the coldest days, meeting the heating load without back-up resistance heating
- Commonly use natural refrigerants with low/no GWP
- 30-50% reduction in operating GHG emissions, with combustion outside

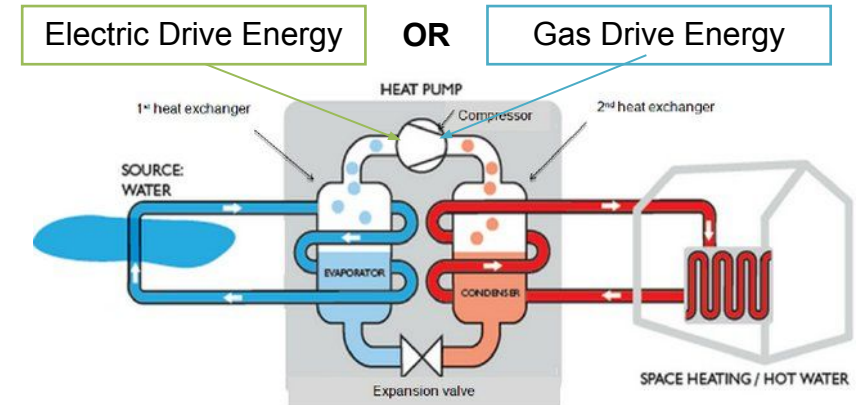


Image Source: Robur

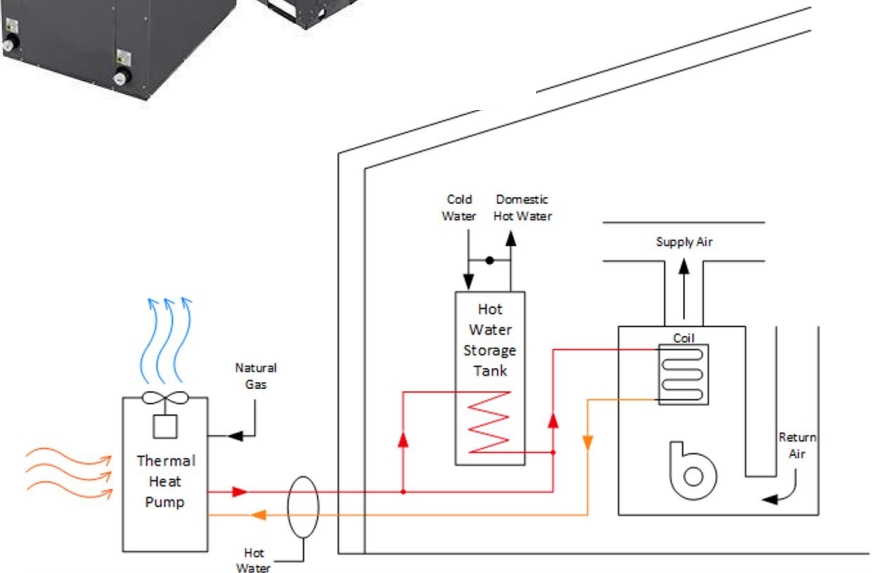
Residential Gas Heat Pump Demonstration

Brief Technology Overview

- The Anesi Gas Heat Pump has an AFUE rating of 140%
- Air-to-water – sealed system, no refrigerant line sets – its water or water/glycol
- It replaces both the gas furnace and water heater, and the 3-part system includes a heat pump, a custom air-handler, and an indirect water storage tank
- The system uses an environmentally friendly natural refrigerant (ammonia) that has Global Warming Potential (GWP) of 0
- The heat pump can operate down to -40°F and can use various energy sources, including natural gas and propane



Image Source: SMTI Anesi

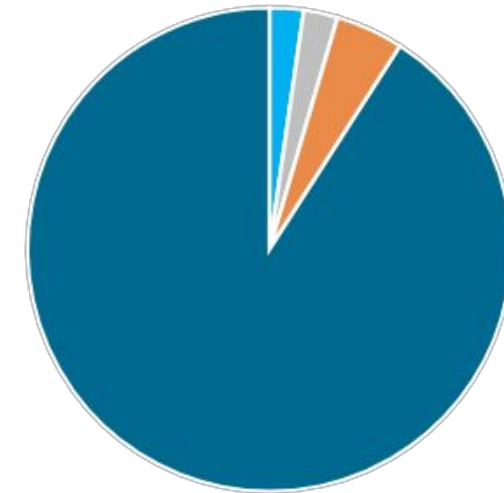


Typical Residential Installation

Residential Gas Heat Pump Demonstration Brief Program Overview

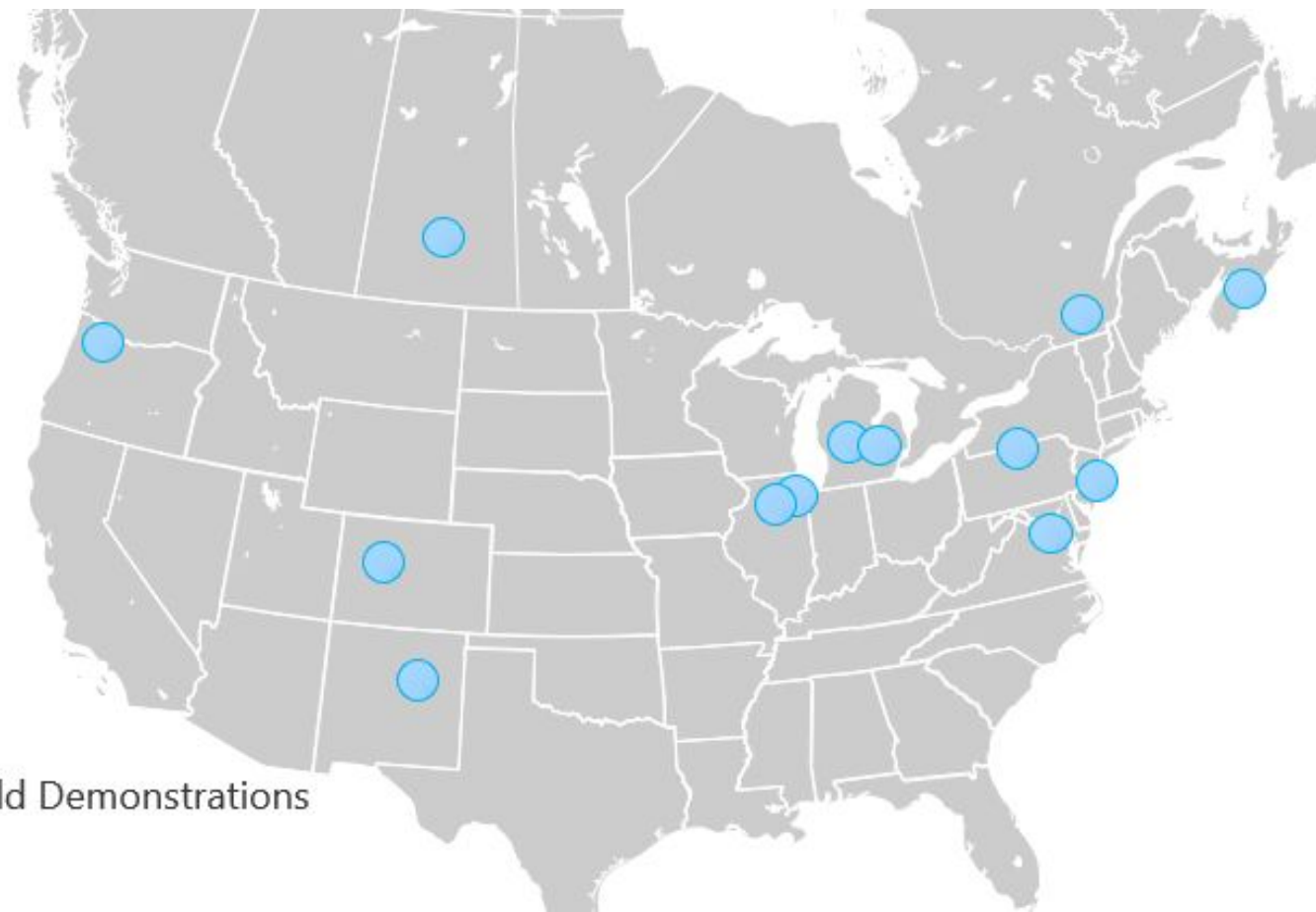
- Real-world field installations in sponsor territories (75+ planned; 45+ installed)
- Climate Zones 4, 5, 6, 7
- Detailed quantitative analysis (20+ w/ extensive onsite M&V data collection)
- Heavy focus on developing distribution network
- Hosting installation contractor trainings virtually and in-person in all sponsor territories
- Thorough qualitative assessments and lesson aggregation

Installations



- Forced Air Space Heating
- Radiant Floor Combi
- Cast Iron Combi
- Forced Air Combi

Residential Gas Heat Pump Demonstration Sponsors and Regions



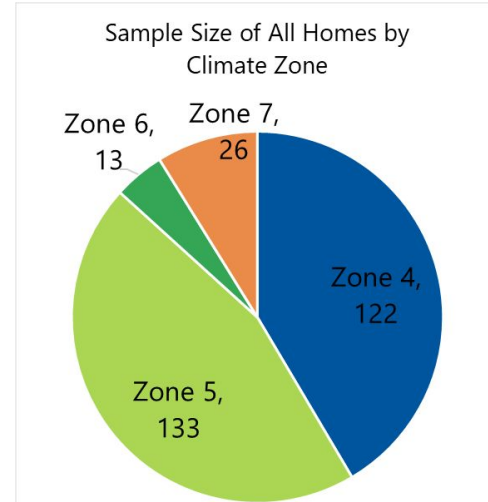
Residential Gas Heat Pump Demonstration Photos from the Field



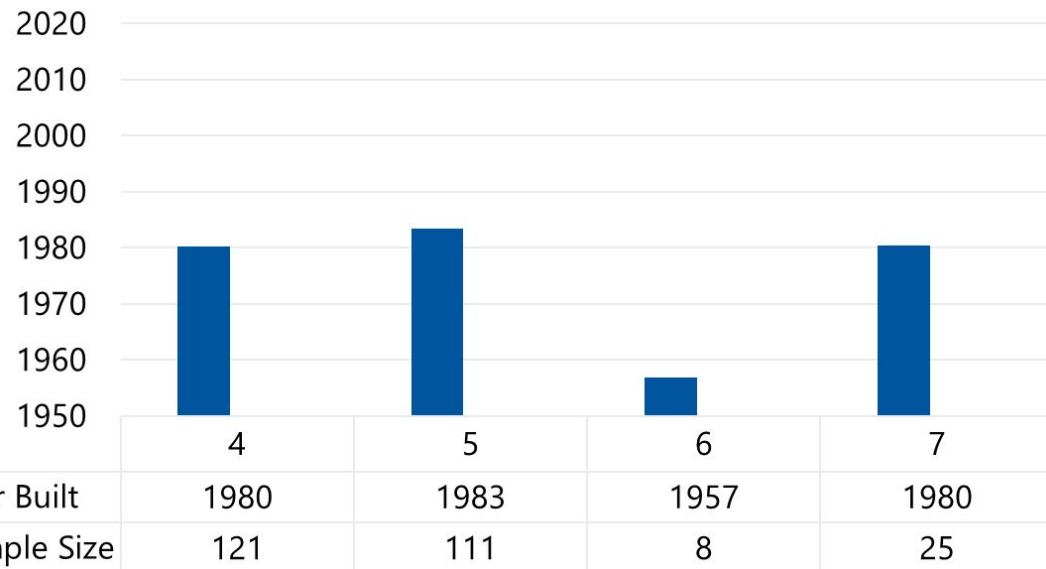
Residential Gas Heat Pump Demonstration Host Site Characteristics



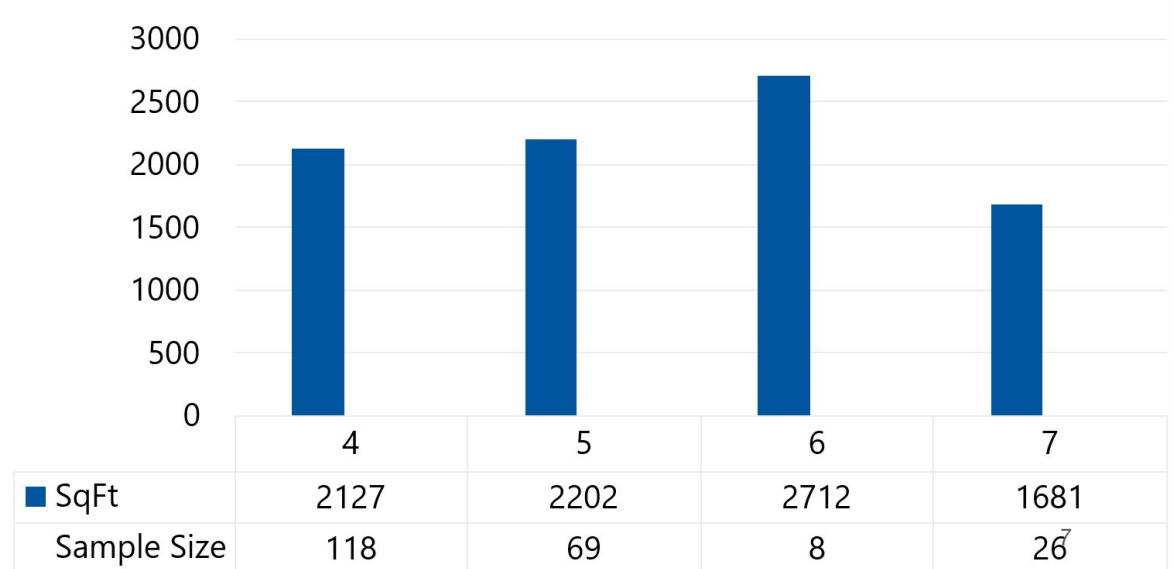
- Approximately 300 homes have been screened through the pilots.
- Average Year Built and Average Square Footage of the homes (where available) are shown by Climate Zone below



Average Year Built of Homes by Climate Zone

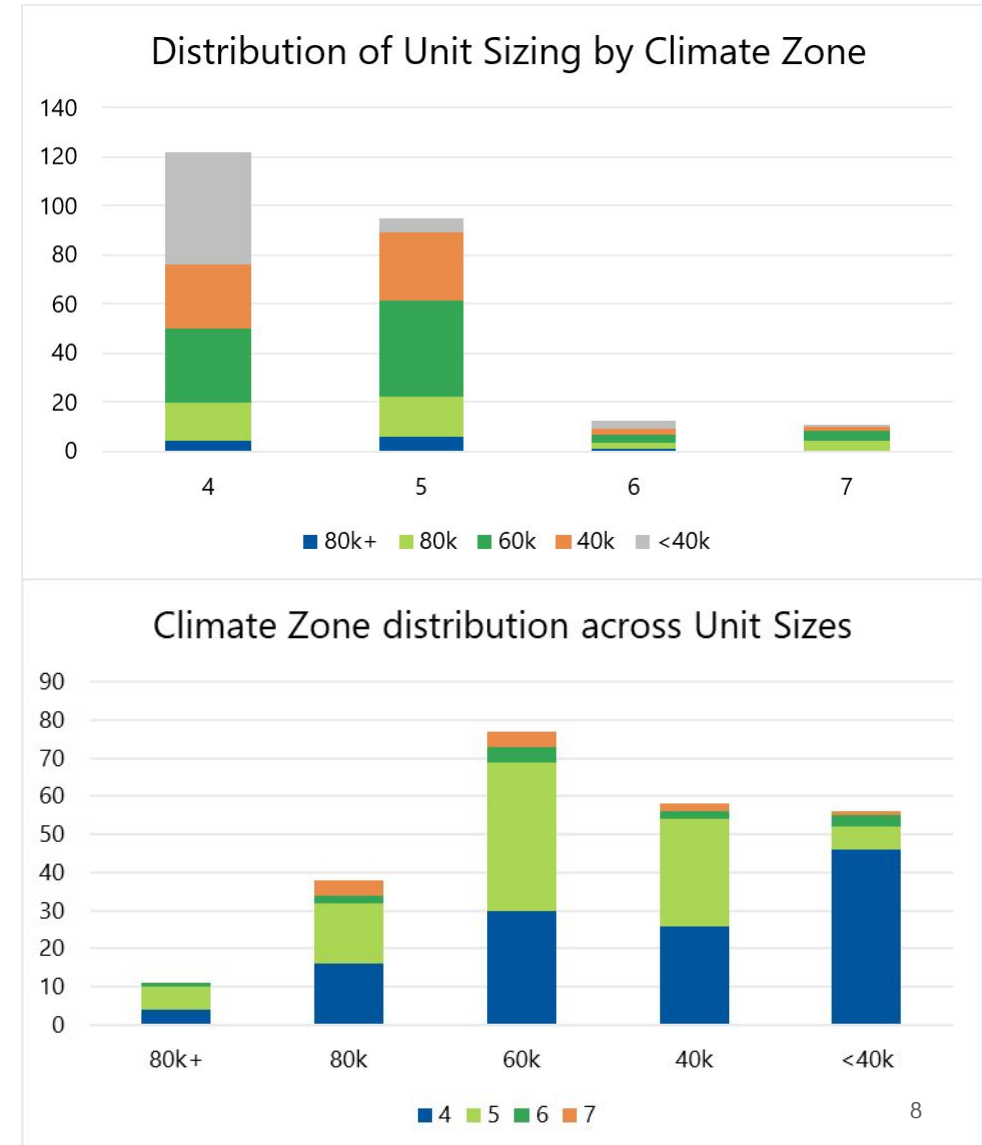


Average Square Footage of Homes by Climate Zone



Residential Gas Heat Pump Demonstration Distribution across Climate Zones

- Currently there is one size available, 80,000 Btu/hr (more planned)
- The charts to the right organize the data on heating load by climate zone, indicating optimal size selection (if available)
- The with the top chart sorting by climate and the bottom chart sorting by unit size.
- Various factors influence home heating load, such as location, sun exposure, home construction, weatherization, etc.



Residential Gas Heat Pump Demonstration

Key Learnings so Far

- It saves energy, but we can do better!
 - Performance optimization- pumps, controls
 - Details matter- sizing, glycol %, combi
 - Compelling results for hydronic applications
- Workforce is critical
 - OEM support and training
 - Buy-in is challenging, but important
 - Product flexibility- size and AHU options
- Lessons learned apply to hybrid and electric air-to-water heat pumps



Image Source: SMTI Anesi

Gas Heat Pumps Next Steps

- Residential Demo Program
 - More forced air only, more radiant
 - More sizes and AHUs in development (40k just certified!)
 - Expecting program results Summer 2026
 - Continued tech dev and testing across several manufacturers
- Commercial GHP Market Transformation
 - Beachhead market- central hot water
 - Cost-effective, multi-family emphasis
 - GTI developing a workforce development tool to support enhanced design and integration, led by Midwest utilities



Questions and Next Steps

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