



**GTI ENERGY**

*solutions that transform*



# Residential Gas Heat Pumps- The Time has Come

Midwest Energy Solutions Conference 2024

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# Heat Pumps: Definitions

- **Heat Pump:** Moves heat from one place to another
  - In the winter, we move heat from outside-in
  - In the Summer, we move heat from inside-out
  
- **Thermally-driven Heat Pump:** Use heat instead of an electric compressor as energy driver
  - Terminology is evolving, aka:
    - *Gas-fired Heat Pumps (GHP)*
    - Fuel-Fired Heat Pumps (FFHP)
  - For heating, combination space and water heating application resemble boiler-based systems

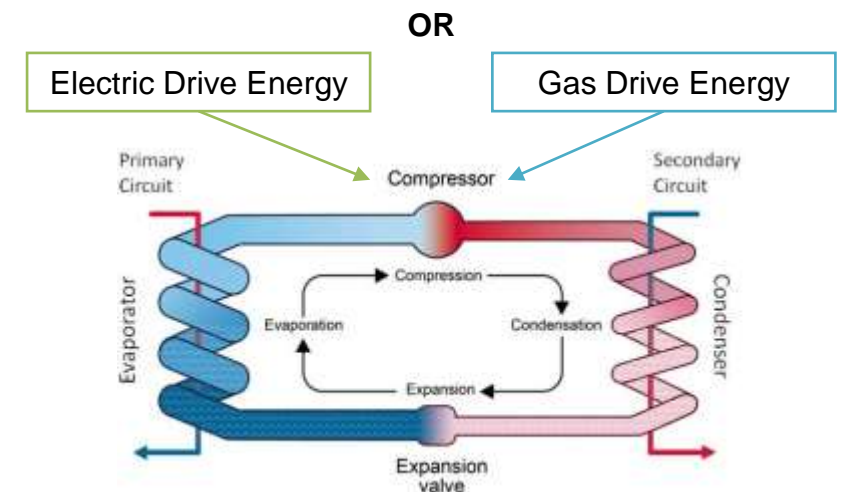


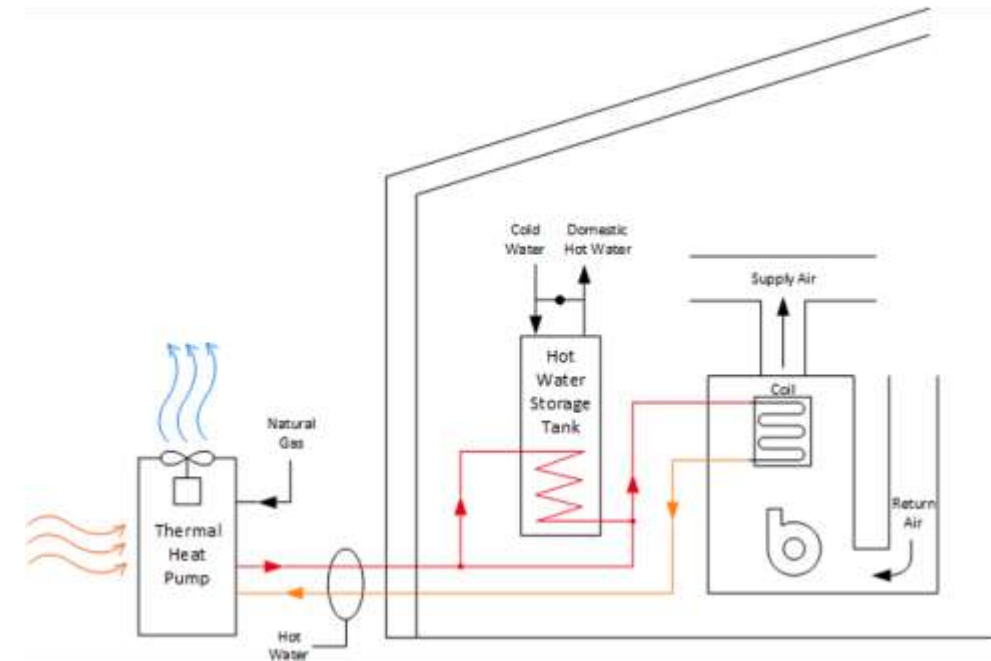
Image Source: ResearchGate

# Gas Heat Pumps (GHP): Motivation

## Why *Gas* Heat Pumps?

- *Best-in-class operating efficiency*
  - Condensing furnace 95-98 AFUE vs Anesi GHP 140 AFUE
  - GTI Energy field demos showed 33-46% therm savings (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

## Typical Residential 'Combi' Installation



### **Mass Market Applications**

Targeting regions with 4,000+ HDDs. The Anesi has the capacity to serve  $\approx 50\%$  of gas & propane heated single-family homes in North America (and many larger multi-family units).

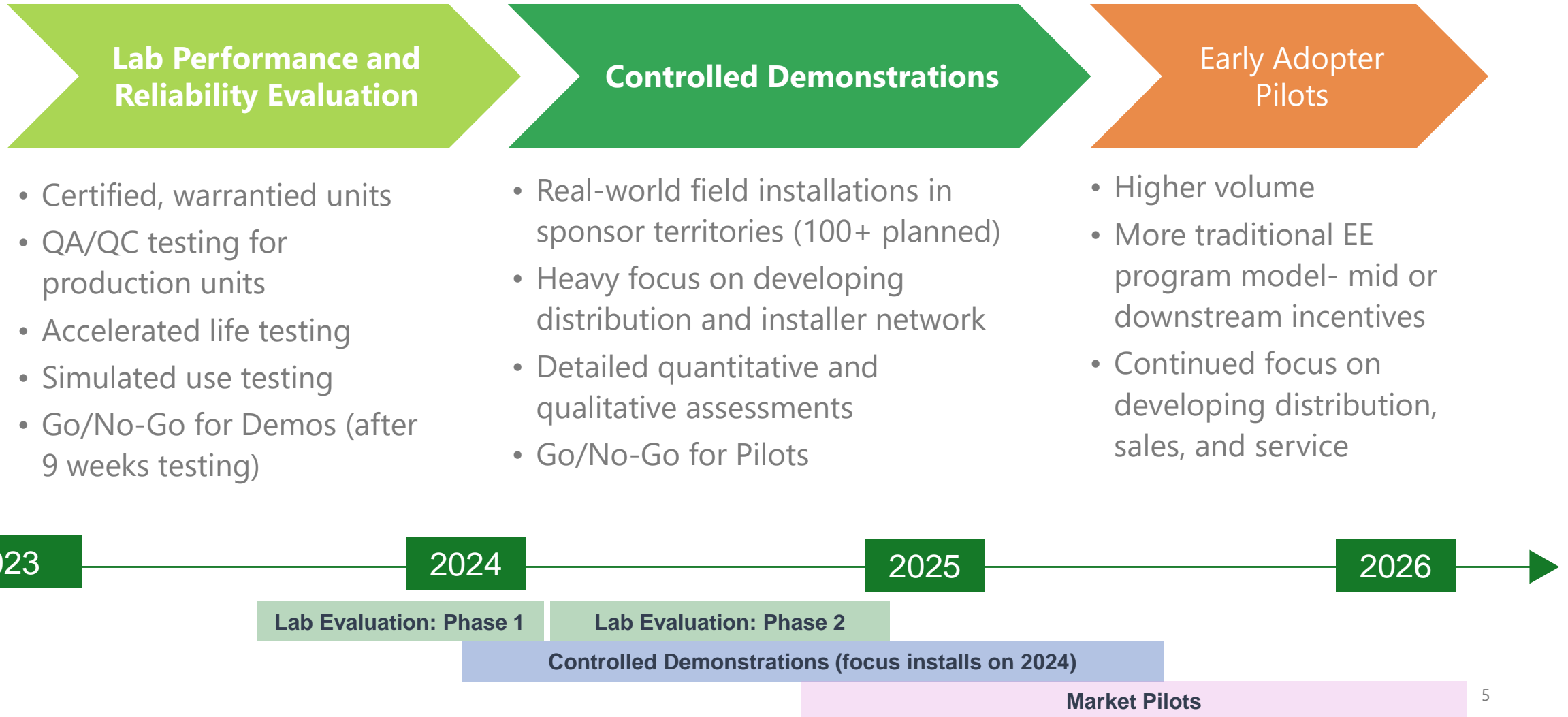
# Gas Heat Pumps: Market Availability

- **Commercial** (products on the market for 10+ years)
  - Robur sells several small commercial market units- space conditioning and water heat (think central multi-family water heat)
  - Yanmar offers VRF heating/cooling units for commercial applications
  - Vicot and others have systems on or near market
- **Residential**
  - GTI Energy is working with Thermolift, Homy/Vicot, and Robur to lab test, ready, and deploy residential space heating/combi units
  - GTI Energy is working with HeatAmp to develop a residential water heater
  - *After ten years of technology and product development, the SMTI Anesi system is hitting the market now.*

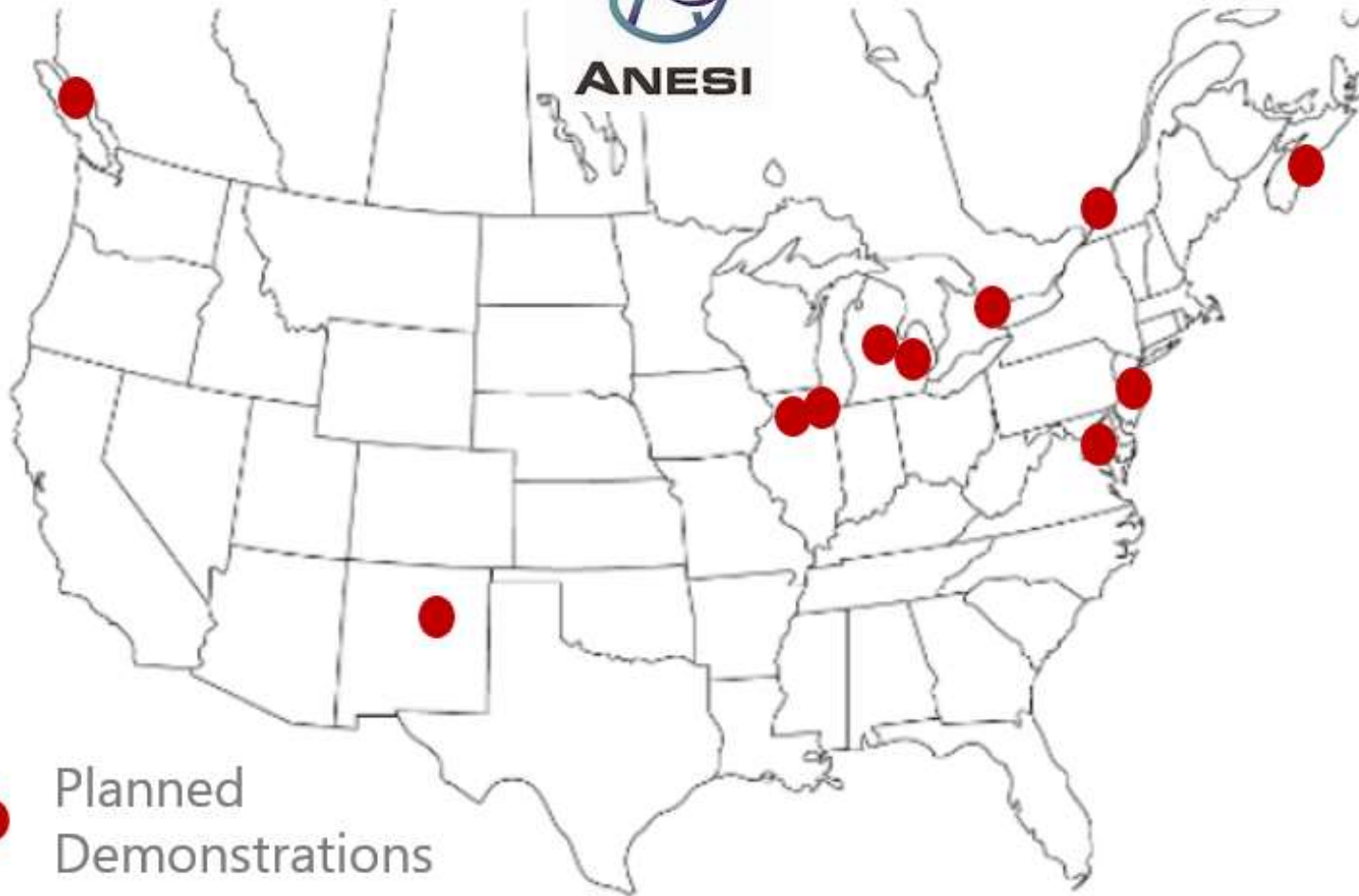


Image Source: SMTI Anesi

# Residential Gas Heat Pump Controlled Demonstration Program: **Process**



# Residential Gas Heat Pump Demonstration: Sponsors and Regions





## Nicor Gas

- Planning up-to **30 residential field demo units**
- Training- Anesi installs planned for Gas Town, College of DuPage and CEDA- Demo installer training next month at GTI
- Commercial demos underway with Illinois National Guard



## PEOPLES GAS NORTH SHORE GAS\*

- Planning **3 residential field demo units**
- Training Center – Anesi install planned at Training Center- Demo installer training next month at GTI



## DTE Energy

- **3 residential field demo units**
- Supported Market Assessment
- Lab Testing Thermolift and Robur
- 1 commercial Robur and 2 Thermolift field demos planned



## Consumers Energy

Count on Us®

- **3 residential field demo units**
- 1 commercial Robur demo planned



GTI Energy develops innovative solutions that transform lives, economies, and the environment

Questions?

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