

# Efficient Water Heating in New Zero Energy Ready Multifamily Buildings

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# Roadmap



Predicting the Market

Technology Development

Program Implementation

# Bonneville Power Administration Context

- **Federal Power Marketing Administration**
  - Provide Power and High Voltage Transmission in portions of seven states
- **Promote Energy Efficiency and Technologies that support our mission**

Bonneville  
POWER ADMINISTRATION



# NEEA Residential Building Stock Assessment

## Distribution of Water Heating in MF Buildings

Water Heater Type	Percentage of Dwelling Units
Central Building System	18.7%
In Unit Storage Tanks	81.2%

## Distribution of In-Unit Water Heating Fuel Types

Water Heater Fuel	Percentage of Dwelling Units
Electric	94.7%
Natural Gas	5.3%

# New Multifamily Construction

**Significant market potential in region**

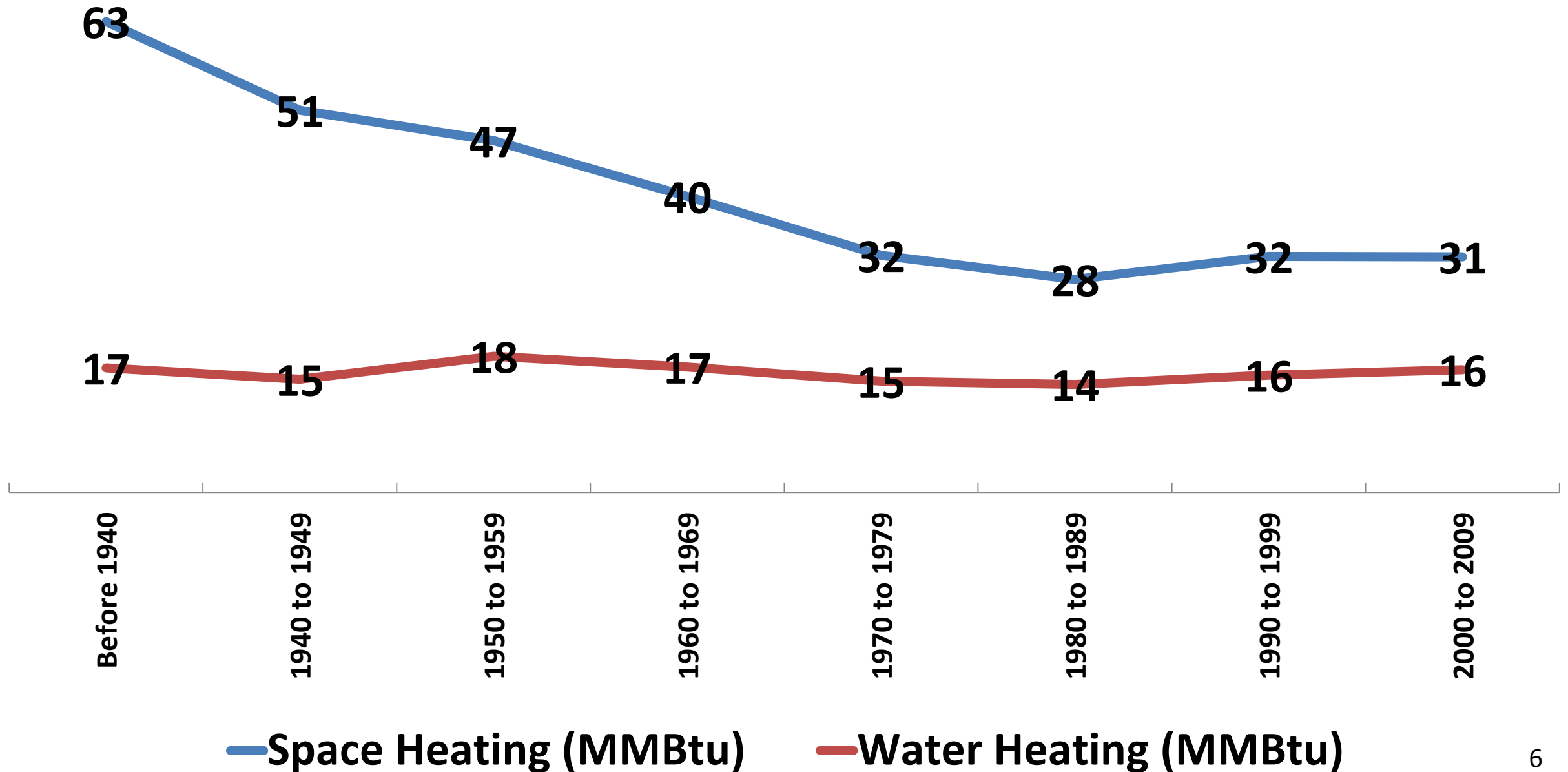
397,000 Low rise and 89,000 high rise units by 2035

## OPPORTUNITY



# Water Heating Load Remains Flat

**Significant HVAC Load Reductions Nationally,  
but not for Water Heating**



# Water Heating



**20% of Multifamily Building Energy Loads**



# BPA Technology Development

**Technology and Innovation:** Research and demonstration, select technologies with the greatest potential energy efficiency benefits to the region <https://www.bpa.gov/EE/Technology/Pages/default.aspx>

**Energy Efficiency Emerging Technologies:** Validate the performance and energy efficiency of commercially-available products and services <https://www.bpa.gov/EE/Technology/EE-emerging-technologies/Pages/default.aspx>



# What We're Working On

## CO<sub>2</sub> HPWH Marketability Assessment

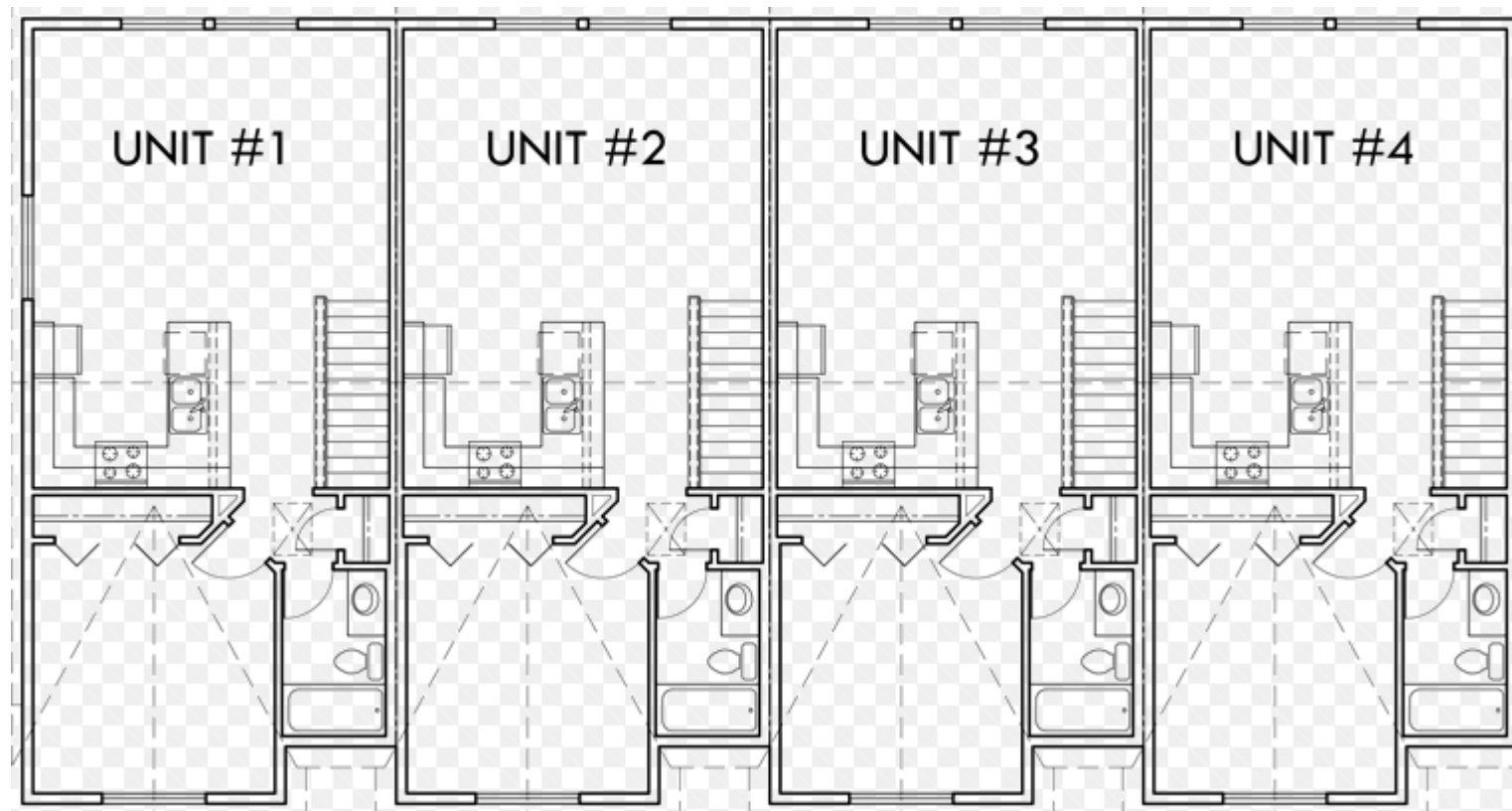
- Facilitate commercialization
- Verify performance and features of the U.L. listed Sanden "Gen3" compared to the earlier model used in field and lab tests
- Lab testing and review of user and installation manuals



# What We're Working On

## Distributed Cluster HP Systems

- Aggregating dwelling units for service by one HP
- Both CO<sub>2</sub> and Non-CO<sub>2</sub>



# What We're Working On

## Small Scale MF CO<sub>2</sub> HPWH Design & Pilot Study

- This project will research, design, pilot, verify, and document a CO<sub>2</sub> HPWH system for small-scale multifamily
  - Create a system sizing tool to help contractors and designers find the right balance of output capacity and storage
  - Design, install and monitor systems in demonstration sites
- Currently seeking demonstration sites

# Water Heating in New Multifamily Construction

Our primary **hurdle** to establishing offerings for high efficiency water heating in new multifamily buildings is cost effectiveness

**Solution:** include them in a high efficiency package

(and develop lower cost approaches)

# The New Package/ Program Concept



# Questions

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