Building the Market for Heat Pump Water Heaters in Commercial & Multifamily Sectors

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Ecotope

Leading transformation of the building industry to energy efficient carbon neutral buildings
Heat Pumps are Standard Practice for Water Heating

Average System COP of 3.0 or better

Use Low-GWP Refrigerants (GWP<750)

Plug-and-Play

Affordable

Reliable and Redundant Systems

Ability to Load Shift
Market Adoption requires design industry knowledge, mature product availability, and supportive programs and policies.
PRODUCT SUPPLY CHAIN

- Standardization of System Designs
- Reduce Risk
- Reduce Cost
- Yield Reliable Repeatable Results
Performance is System Design Dependent

55 Tons / 1,000 Gallons

5 Tons / 520 Gallons
Market Delivery Models

**Business As Usual**

CUSTOM ENGINEERED SYSTEM
All the pieces are separate and come from multiple distributors and/or manufacturers.

**Current Market**

SPECIFIED BUILT-UP SYSTEM
All the pieces are separate but come from a single distributor or manufacturer.

**Future Market**

PACKAGED / SKID
Everything is assembled and delivered in a single package.
Technology Innovation Model

1. **FEASIBILITY**
   - Due Diligence
   - “Fail Fast”

2. **APPLICATIONS TESTING**
   - Full System Mock-Up

3. **DEMONSTRATION**
   - Real World Learning

4. **M & V**
   - Performance Feedback

5. **GO TO MARKET**
   - Supply Chain, Training

- Deployment
- Optimized Product
- Performance Validation
- System Improvement
Fully-Packaged CHPWH Product Delivered
… and Installed
CHPWH Opportunity for Load Shift

Water Heating – Baseline

Water Heating – Load Shift
SPECS, POLICY, PROGRAMS

- Advanced Water Heater Specification
- Qualified Products List
- Model Energy Codes
- Model Utility Programs
M&V – Validation and Data Library

Ideal System Performance

Real-World System Performance

COP 3.2 - 3

COP 3.1 – 2.7
Ecosizer

This system was sized for:

- Occupancy: 60.0 People
- Apartments: 30.0 Units
- Daily Hot Water Usage: 25.0 Gallons per Day per Person
- Total Hot Water: 1500 Gallons per Day

Tank Volume: 285 Gallons

Heating Capacity: 66.8 kBTU/hr

Swing Tank Volume: 80 Gallons

Swing Resistance Element: 4.7 kW · 15.9 kBTU/hr

https://calbem.ibpsa.us/resources/ecosizer/
• Required in Seattle R1/R2
• Performance Baseline in T24
• Option Pathway in IECC, WSEC
• Proposed R1/R2 Requirement for IECC, WSEC
MARKET KNOWLEDGE

- Training Programs
- Marketing and PR
- Design Guidance
Wide Range of Funders

- Utilities
- Energy Policy Organizations
- Manufacturers
- Housing Providers
- Non-Profits
- Developers
Putting the Market Package Together

- Products
- Knowledge
- Policy

- Supply Chain
- Packages
- Installers
- Operations
- Performance Feedback
- Training

- Manufacturers
- AWHI
- Design Expertise
- Design Guidance

- Test Protocols
- Code
- Incentives
- Case Studies
- Grid Integration

- Performance Standards
- AWMI
- Design Tools

- Market Potential
- Manufacturers
- Design Guidance
- Design Tools

- Performance Feedback
- Training
- Design Guidance
- Design Tools

- CHPWH
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