

ACEEE Water Heating Forum: Integrated HPWHs in Multifamily in the Northeast

March 13, 2019

- Heat pump water heaters (HPWHs) and multifamily buildings



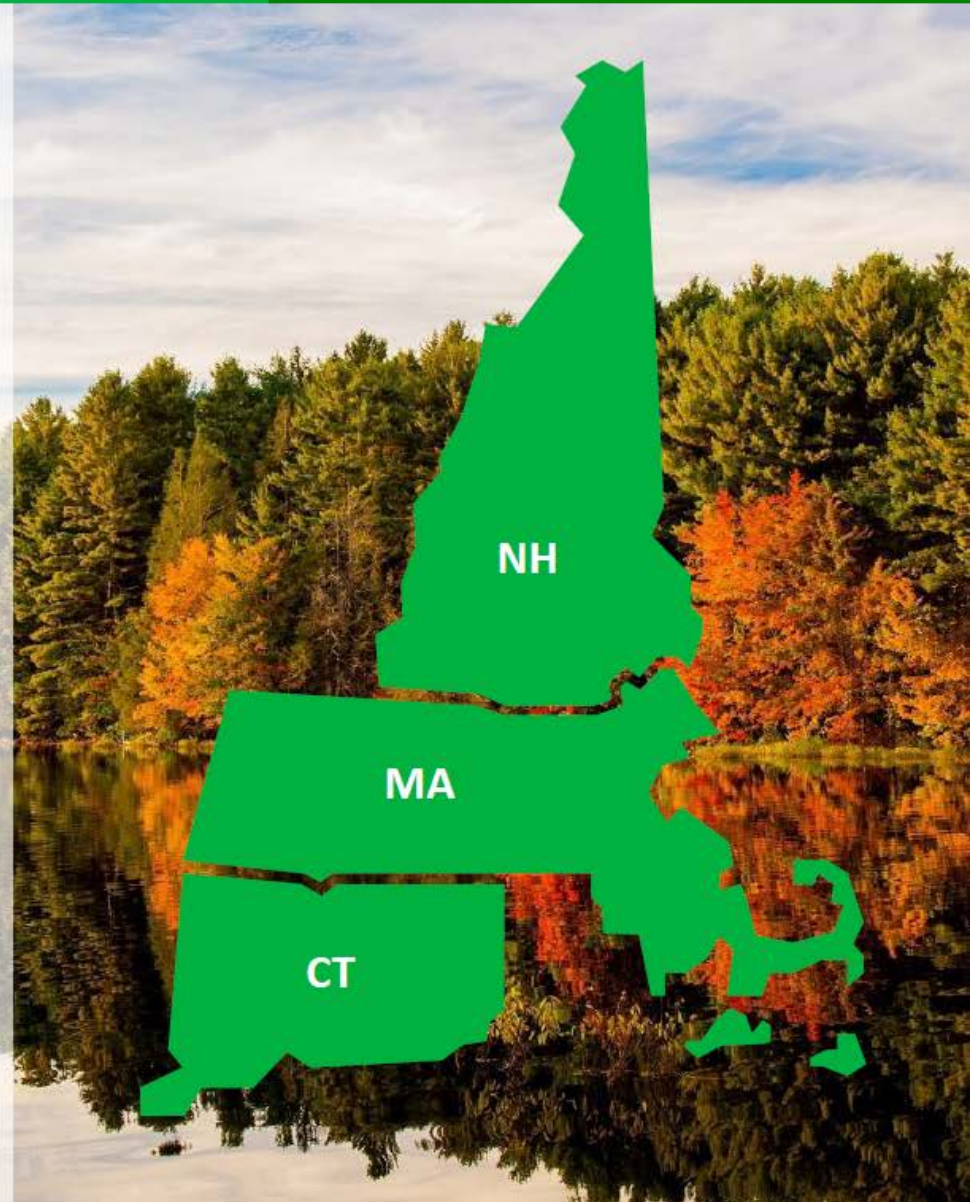
#1 ENERGY PROVIDER IN NEW ENGLAND

EVERSOURCE

- 3 states
- 3.6m customers
- 8,000 employees
- \$500m+ annual EE investment

 **Ceres #1 Ranking**
*Mobilizing Business Leadership
for a Sustainable World*

ACEEE
American Council for an Energy-Efficient Economy



2019 CT Residential HPWH Program

- \$750 Instant Discount Rebate
- ENERGY STAR® certification required
- Uniform Energy Factor ≥ 3.0 and storage capacity of 55 gallons or less
- \$750 instant discount rebate at distributor
- \$400 instant discount rebate at retail (with additional \$350 mail in)
 - April 1st, \$750 instant discount at retail
- Point of Purchase (POP), Social Media, Radio & Geo targeted ads, Direct Mailers & educational brochures

SPECIAL PRICING ON SELECT ENERGY STAR® ELECTRIC HEAT PUMP WATER HEATERS

\$750 INSTANT DISCOUNT
PRICE OF PARTICIPATING MODELS REFLECTS ENERGIZE CONNECTICUT INSTANT DISCOUNT

ASK OUR SALES AND SERVICE TEAM FOR DETAILS.

For more information call 877 WISE USE (877-947-3873) or visit EnergizeCT.com

SPECIAL PRICING BROUGHT TO YOU BY

energize CONNECTICUT | EVERSOURCE | UI

Heat Pump Water Heaters

use **50% Less Energy** than standard electric water heaters!

Replace your old unit before it fails!

EVERSOURCE | UI

energize CONNECTICUT 1-877-WISE-USE EnergizeCT.com

HEAT PUMP WATER HEATERS 101

NEW! What's New?

Energy Guide

What is a Heat Pump Water Heater?

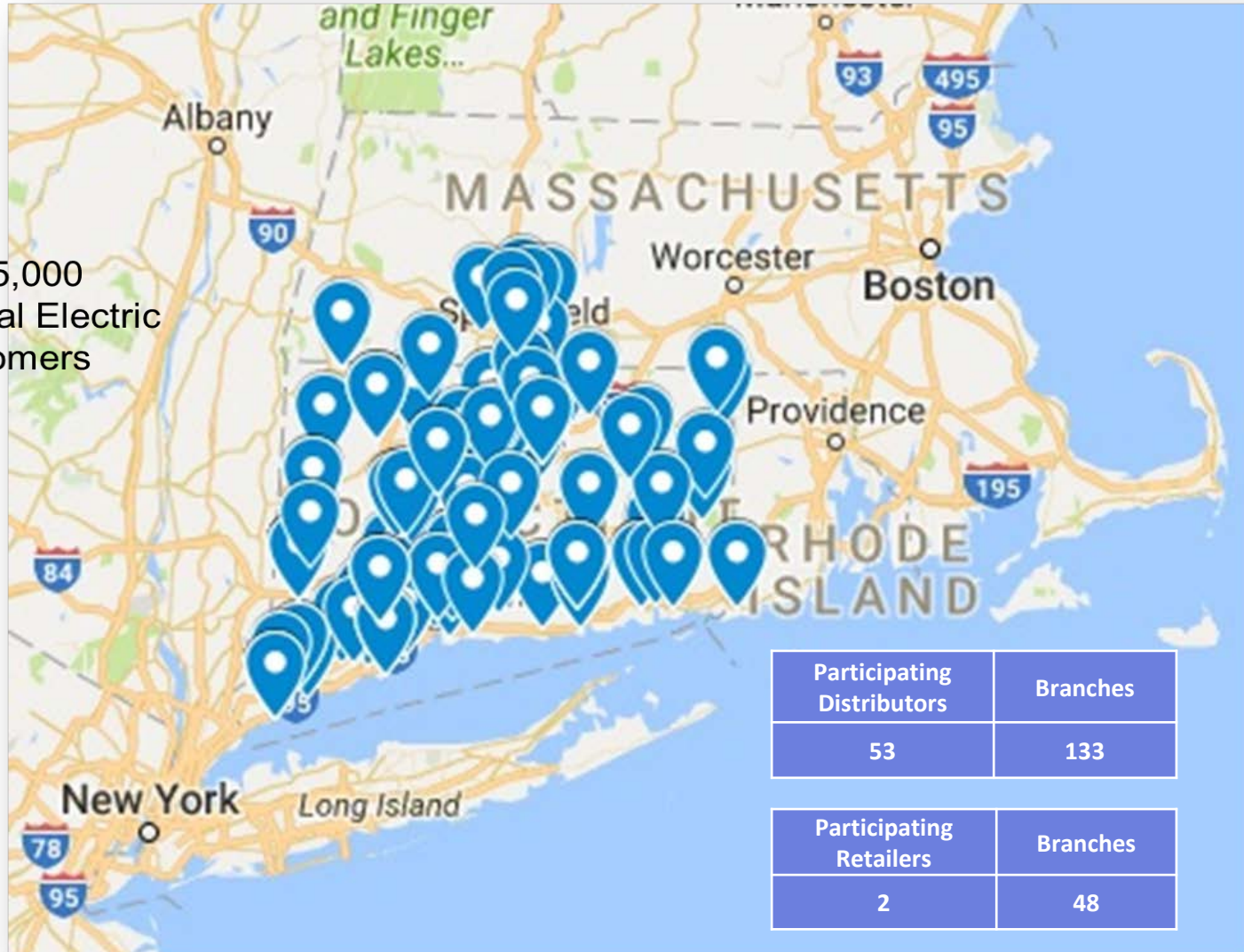
Is it Right For You?

When Does it Work Best?

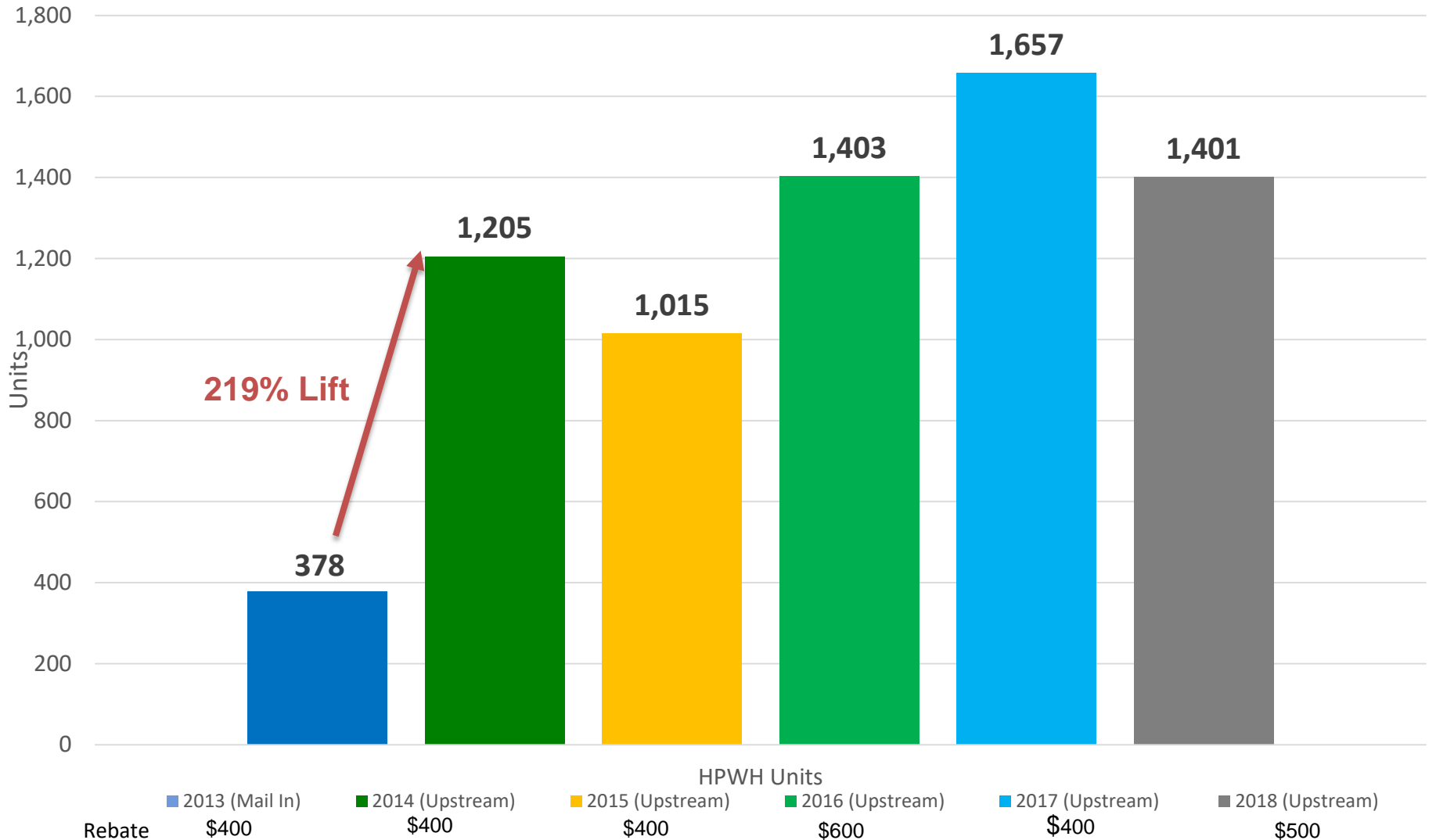
ENERGYGUIDE

CT Service Territory

1,325,000
Residential Electric
Customers



HPWH Upstream/Midstream Activity (2013-2018)



Field Implementation

- Regular visits to retail/distributors
- Point of Purchase (POP) placement
- Customer interaction
- Counter days

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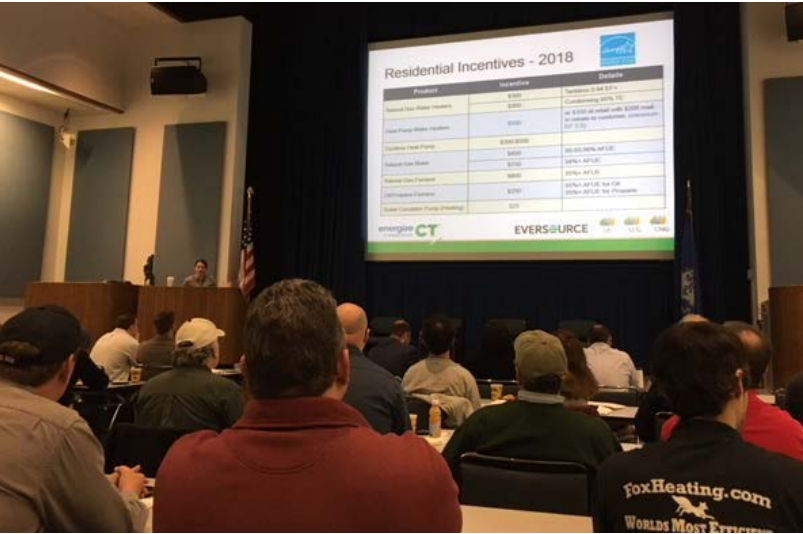
For more information call
877.WELL.US2
877.949.3675
or visit
EnergizeCT.com

SPECIAL PRICING BROUGHT TO YOU BY
ENERGIZE CT EVERSOURCE

The image shows a promotional sign for Energy Star Electric Heat Pump Water Heaters. The sign features a green header with the text 'SPECIAL PRICING ON SELECT ENERGY STAR® ELECTRIC HEAT PUMP WATER HEATERS'. Below this, it highlights a '\$750 INSTANT DISCOUNT' and states that the price reflects the 'ENERGIZE CONNECTICUT INSTANT DISCOUNT'. It encourages customers to 'ASK OUR SALES AND SERVICE TEAM FOR DETAILS.' and provides contact information: 'For more information call 877.WELL.US2 877.949.3675 or visit EnergizeCT.com'. The sign also includes the 'ENERGIZE CT' and 'EVERSOURCE' logos at the bottom. To the right of the text is a photograph of a white electric heat pump water heater.



Contractor Training



SF in the Northeast:

- These work! (mostly)
- Open, unfinished basements
- Other applications (e.g. closets) don't work so well.

MF in the Northeast:

- ...?

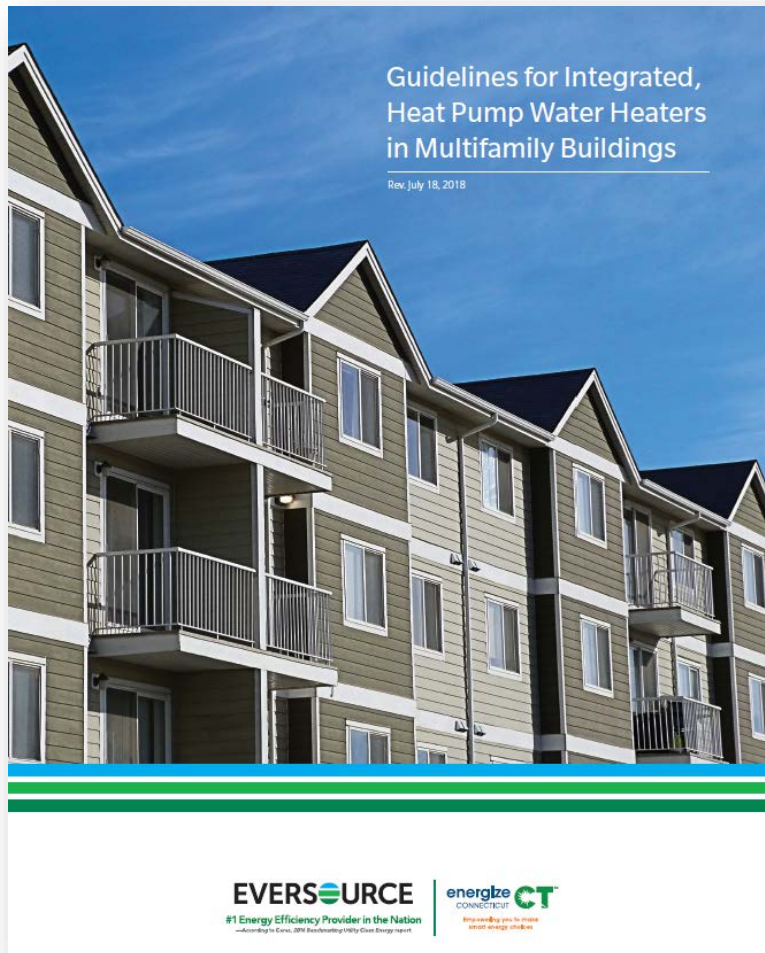


What does this mean for Multifamily?



Multifamily HPWH Guidelines

EVERSOURCE



Very stringent! Specific to:

- **Northeast (colder climate)**
- **Integrated HPWHs available today**
- **HPWH provides 100% DWH**

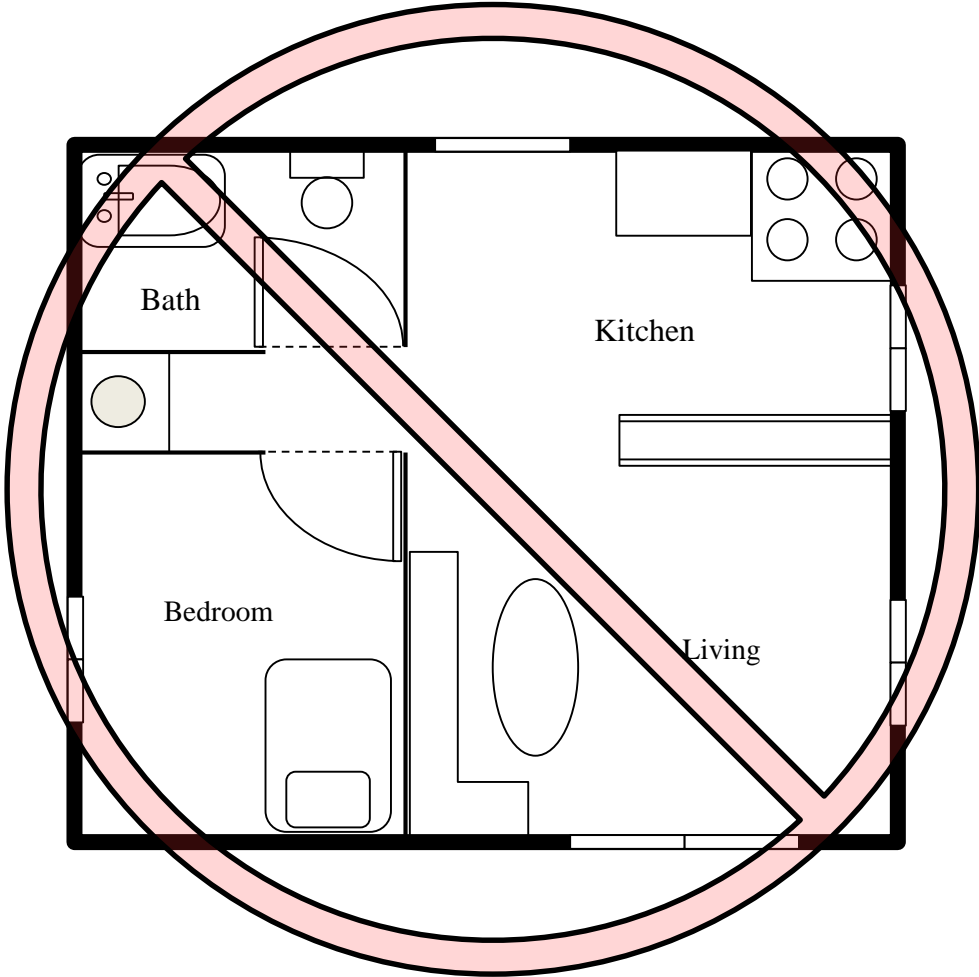
Will need to update when:

- **New products**
- **New applications**
- **New studies**

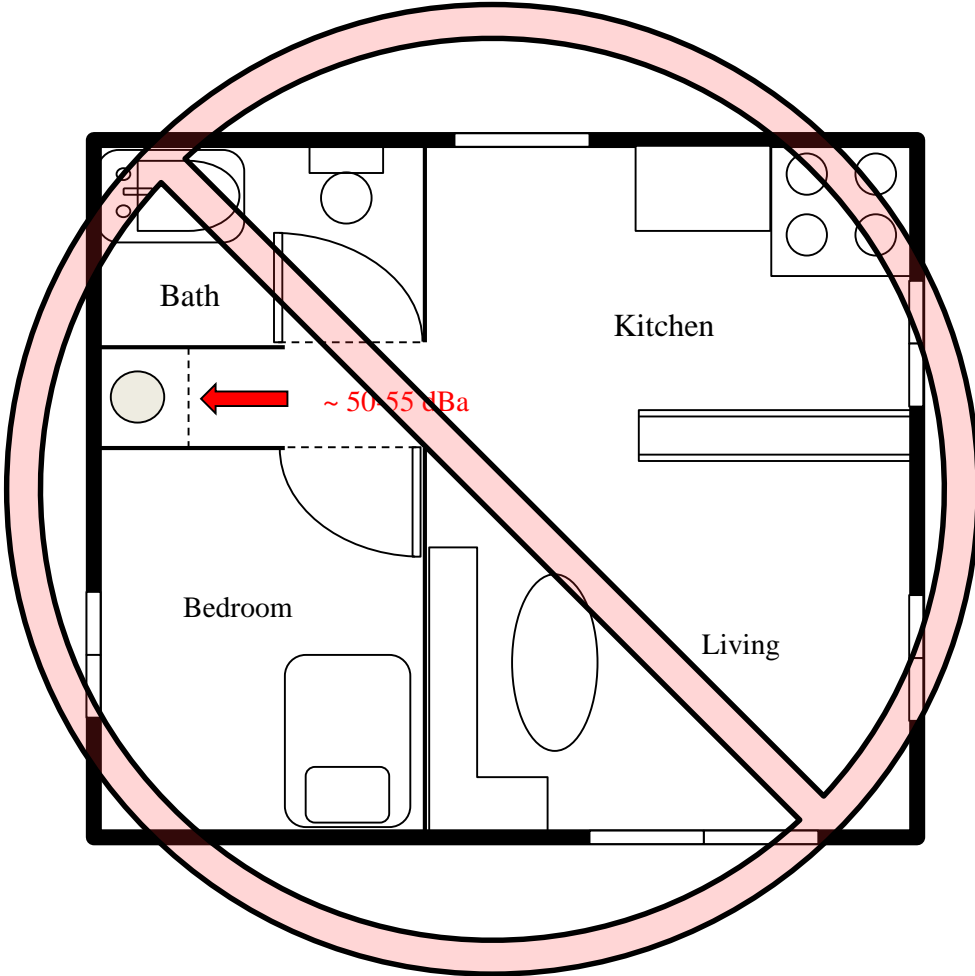
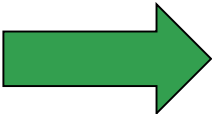
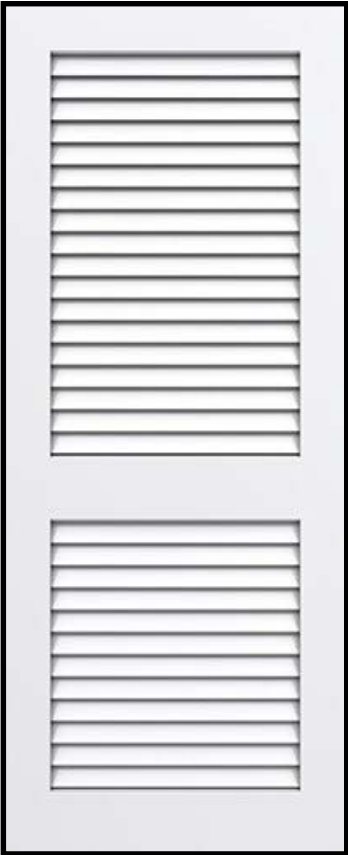
Best outcome:

- **Help people UNDERSTAND and THINK!**

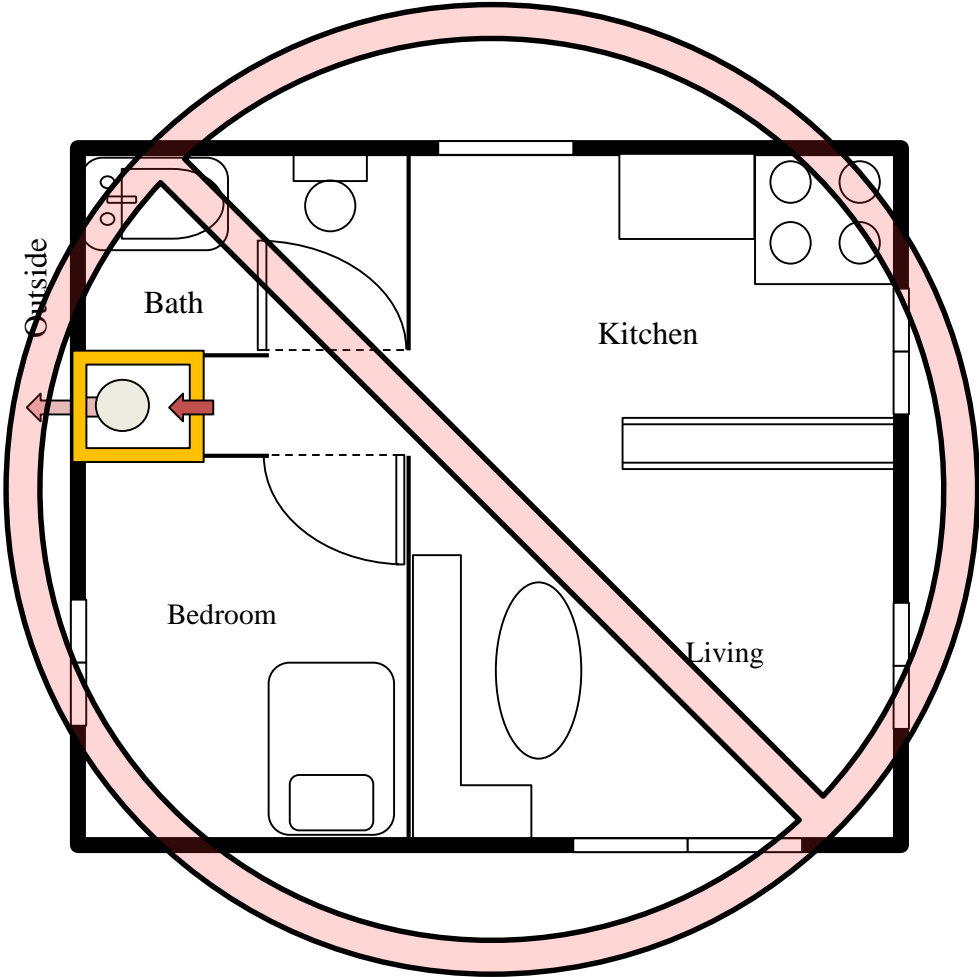
In-Unit HPWH



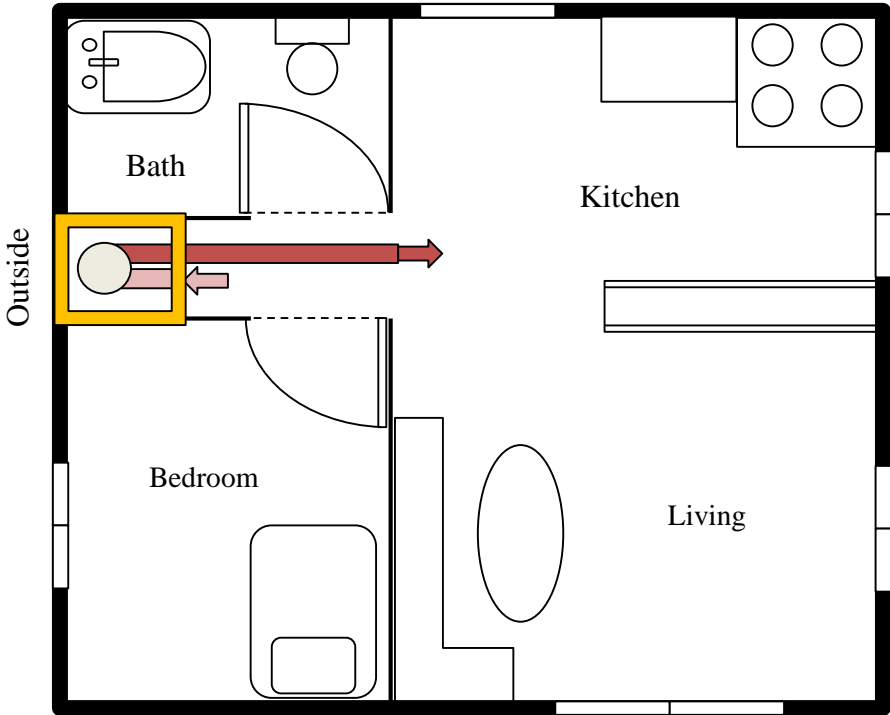
In-Unit HPWH



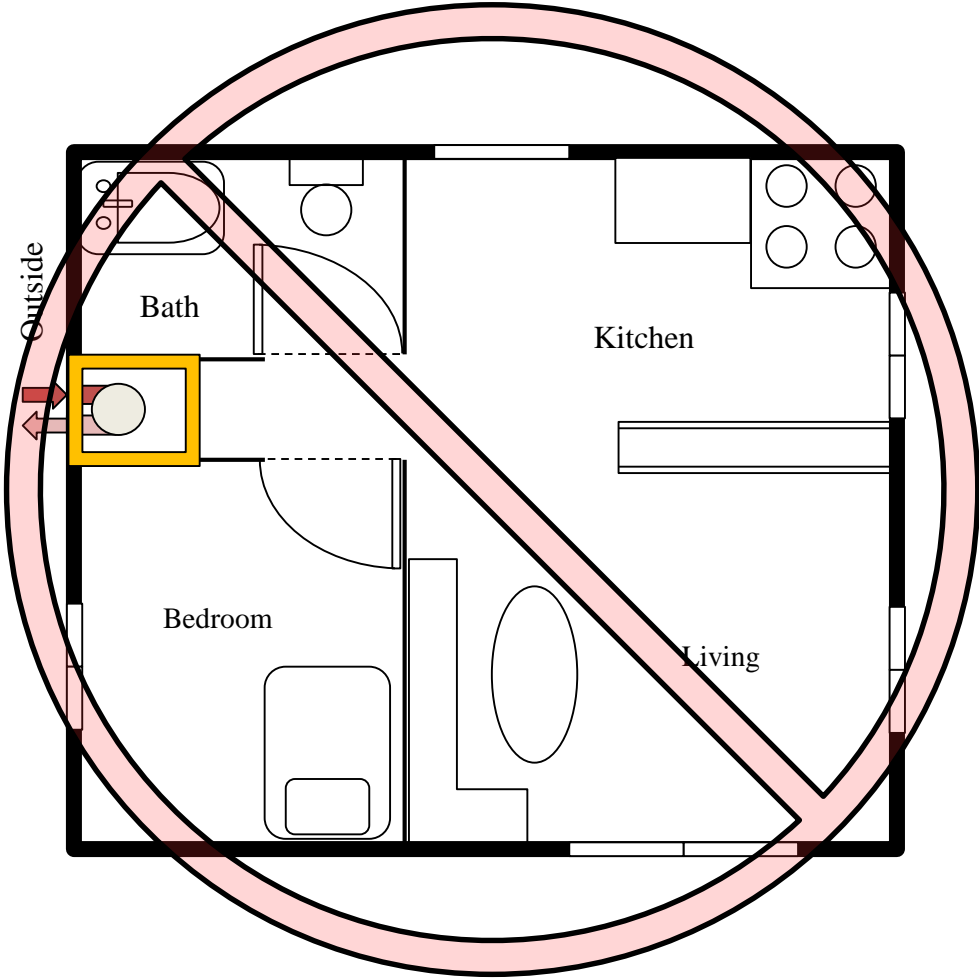
In-Unit Ducted HPWH



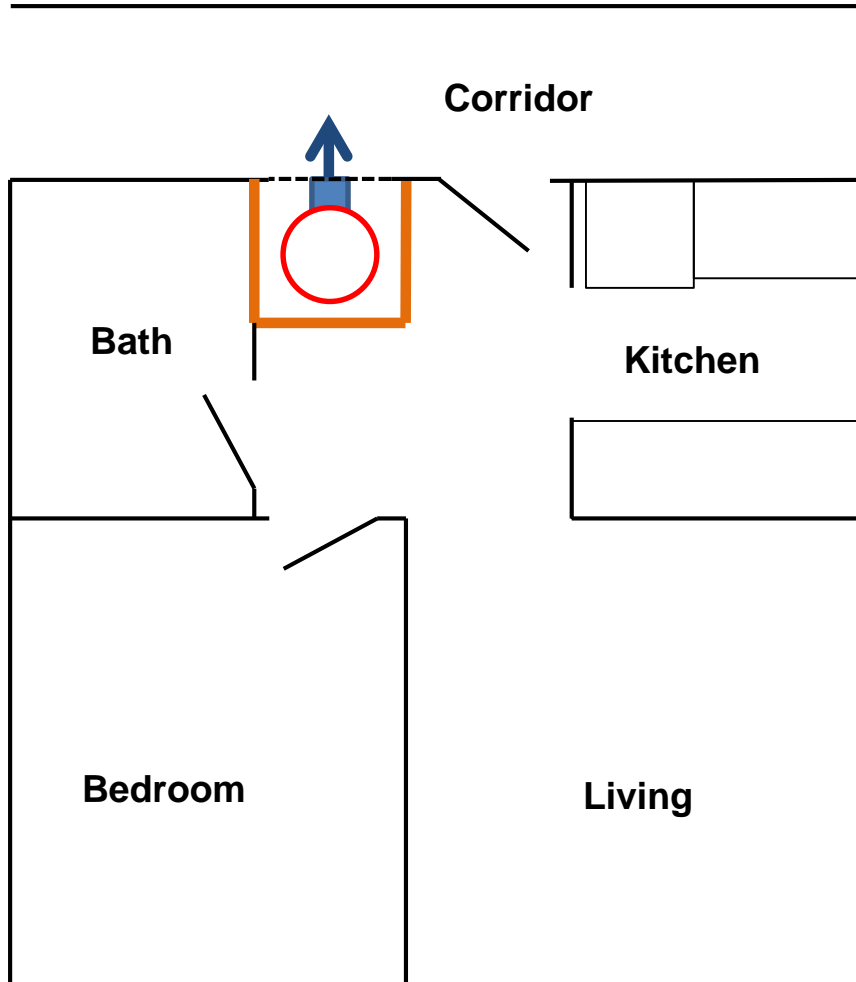
In-Unit Ducted HPWH



In-Unit Ducted HPWH



Near-Unit HPWH



- HPWH located outside of apartment envelope
- Sound-rated assemblies
- HPWH exhaust is ducted to corridor
- Air replaced via a louvered door
- Corridor has adequate volume and space heating

HPWH Plants Serving Group of Apartments



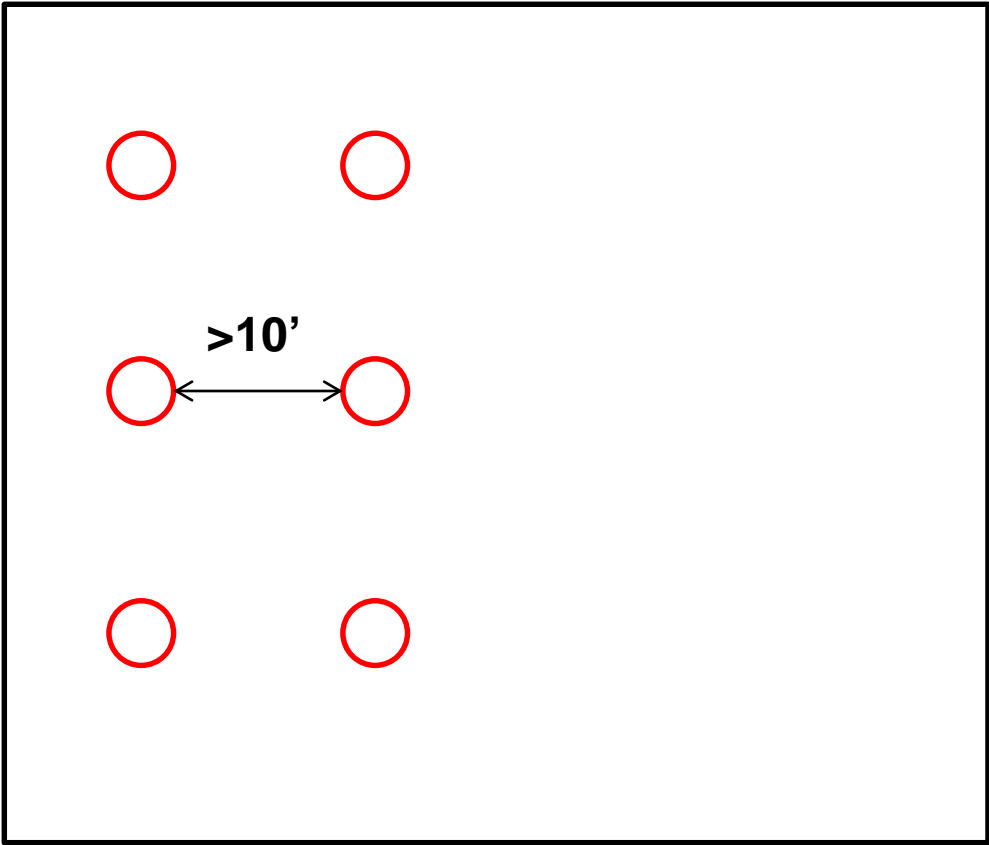
HPWH Plants Serving Group of Apartments



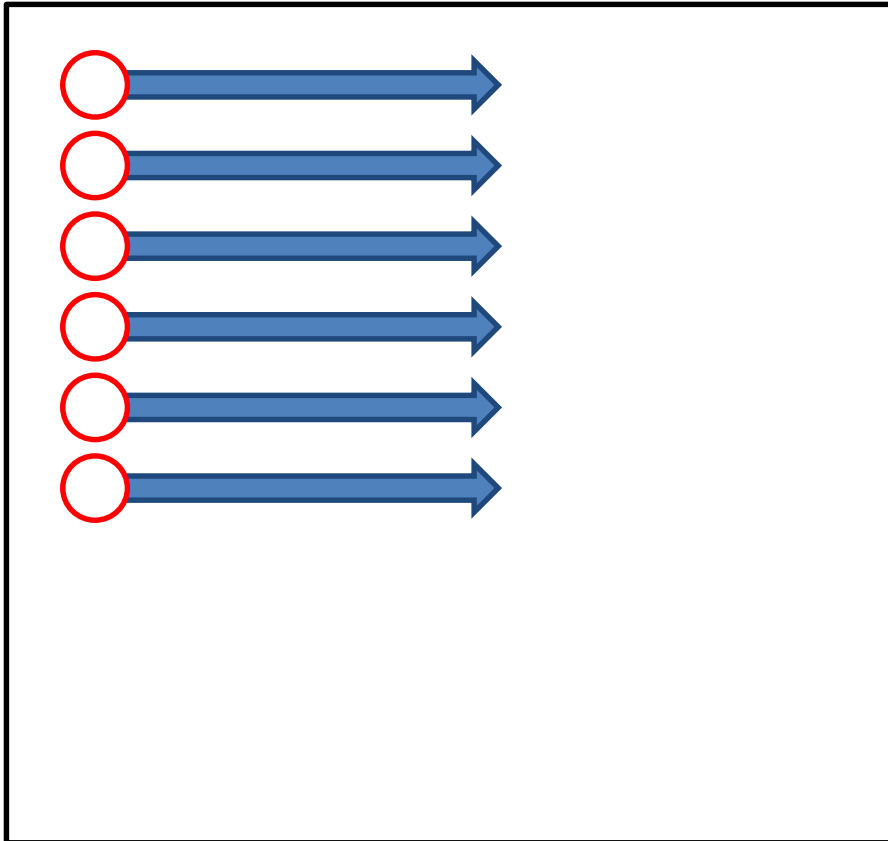
HPWH Plants Serving Group of Apartments



Central Plant Considerations



Central Plant Considerations



- HPWHs within conditioned space (cold climate)
- Air intake at least 10' from any HPWH exhaust
- Room/intake air temperature heated to ~50°F*
- No resistance space heat!
- Correct size & number of HPWHs for load

Multifamily HPWH Scenarios

Scenario 1: HPWH Located In Each Apartment (Non-Ducted)

Scenario 2: HPWH Located In Each Apartment (Ducted)

Scenario 3: HPWH Located Near Each Apartment / Heat Drawn From & Exhausted To Separate Spaces

Scenario 4: HPWH For Each Apartment Located In Remote Location

Scenario 5: HPWH “Plants” Serving Entire Building Or Group of Apartments

Recommendations for All Systems

- Consider locating HPWHs where they can draw air from rooms with waste heat from other systems.
 - Do not draw air from rooms with dust or corrosive elements
- Insulate hot water piping to at least R-4
- Install ENERGY STAR™ certified dishwashers and clothes washers
- Install WaterSense™ certified bathroom aerators and showerheads, and kitchen faucets less than or equal to 2.0 GPM
- Design compact hot water distribution plumbing
- Use demand-controlled recirculation where appropriate
- Consider air-to-water heat pumps with compressors and evaporators located outdoors.
 - Several types and sizes are available, but be mindful of capacity and efficiency limitations

With current integrated HPWH products, it is not always possible or practical to use HPWHs in many multifamily buildings.

In such situations, electric resistance storage water heaters may be a practical solution.

When using electric resistance storage water heaters, follow these guidelines:

1. Install water heaters with energy factor (EF) of at least 0.95 (UEF \geq 0.93)
2. Insulate all hot water piping to a minimum of R-4
3. Install ENERGY STAR™ dishwashers and clothes washers
4. Install WaterSense™ bathroom faucets and kitchen faucets less than or equal to 2.0 GPM

Considerations for Ducted & Non-Ducted Systems

Non-Ducted

- Locate HPWH within thermal envelope
- Space must have free volume of at least 1,000 ft^{3,1}
- Must NOT locate in areas where cold air discharge will cause comfort issues
- Intake must be 10 feet away from cooking appliances
- Exhaust must be 10 feet away from HVAC thermostat

Ducted

- Within thermal envelope
- If located in room with less than 1,000 ft³ volume¹, intake or exhaust must be ducted outside of room
- HPWH exhaust must **NOT** be delivered directly to areas where cold air is likely to cause comfort issues
- Ducts must **NOT** be run to outdoors
- If only one side of HPWH is ducted, free area of at least 2 ft²/100 CFM of air flow must be provided to room where HPWH is located^{2,3}

1. Or other minimum free air volume as listed in product literature

2. Ex. If a HPWH in a closet moves 200 CFM, louvered doors with 4 ft² of free area can meet this requirement.

3. Where air flow is unknown, assume 400 CFM

Thank You

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