

BUILDINGENERGY BOSTON

Overcoming Barriers to Heat Pumps in Multifamily Buildings

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Overcoming barriers to heat pumps in multifamily buildings

BuildingEnergy Boston Conference - NESEA



Reason for study

Massachusetts targeting net-zero greenhouse gas emissions by 2050 and level of emissions 85% below the 1990 level

Program Administrators (PAs) Three-Year Energy Efficiency Plan 2022-2024 – programmatic priority: ***electrification***

Key measure: **HEAT PUMPS**. Uptake in single family homes is greater than in multifamily buildings. Why?

About the study

- › MF buildings (3+ units)
- › Market rate
- › Retrofit
- › All type of heat pumps – space heating

Supply
Side
Interviews
(online)

15

contractors

10

distributors

4

permitting offices

3

electricians

Demand
Side
Surveys
(online)

37

MF building
owners

31

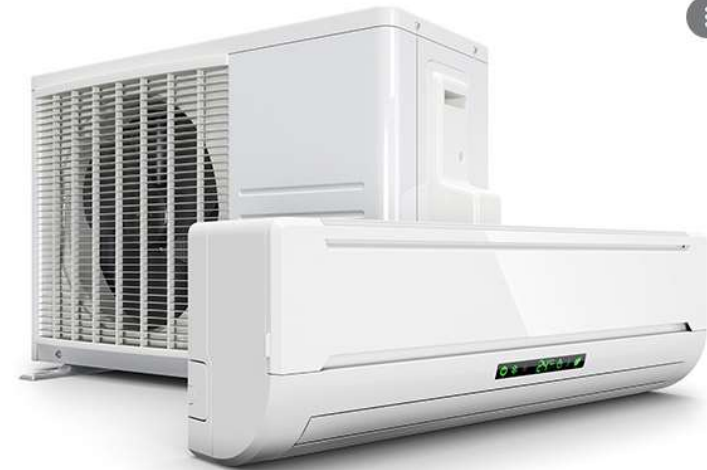
MF property
managers

30

condo unit owners

10

renters

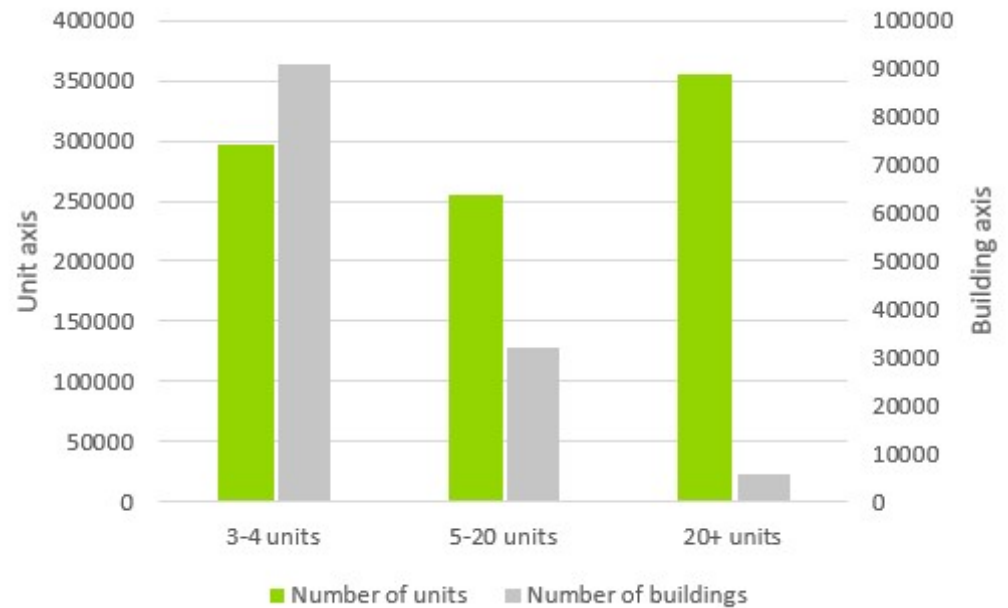


Market characterization

Buildings, Heat Pumps, Stakeholders

Multifamily Building Stock

- 128,797 MF buildings (including 3- and 4-unit buildings)
- 907,495 units

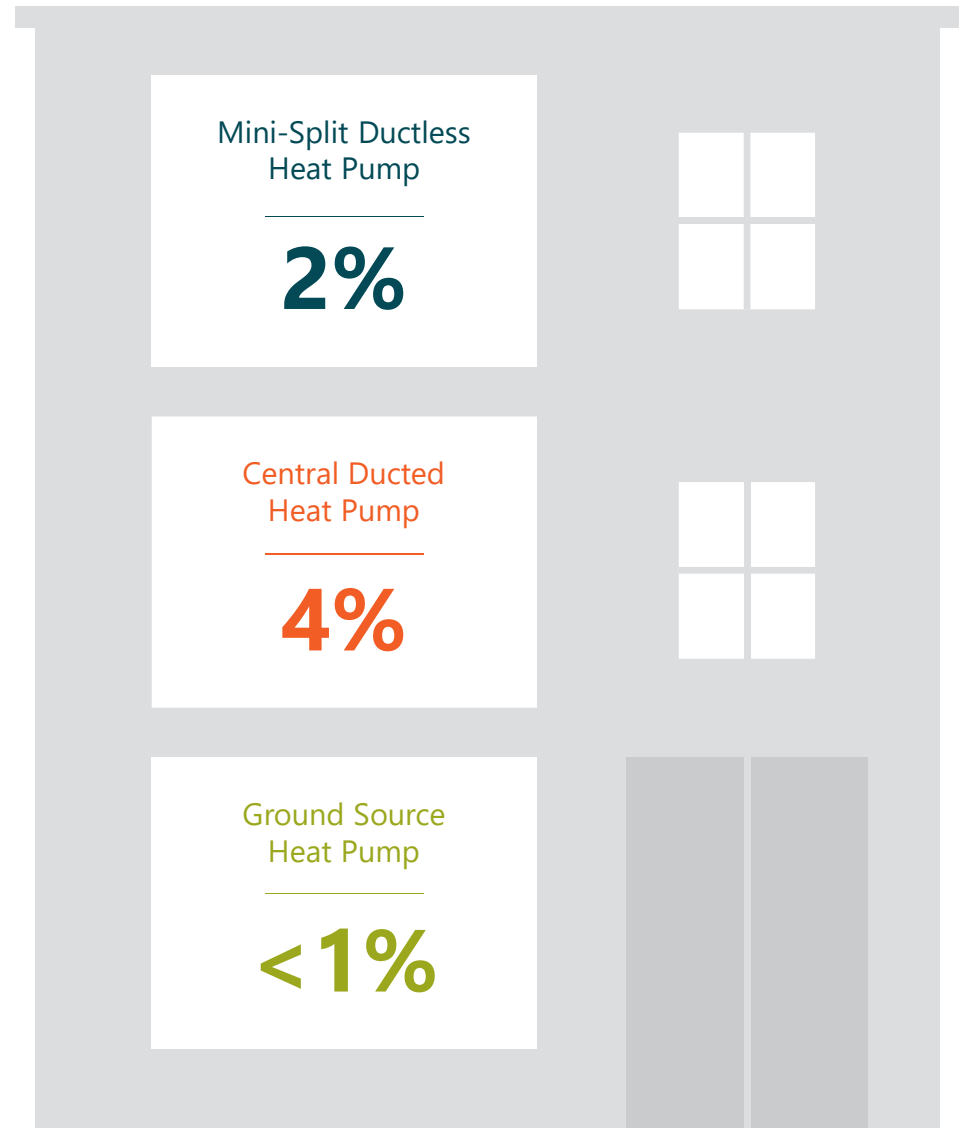


Source: Navigant, 2018. Census of Massachusetts Multifamily Buildings (RES 43).

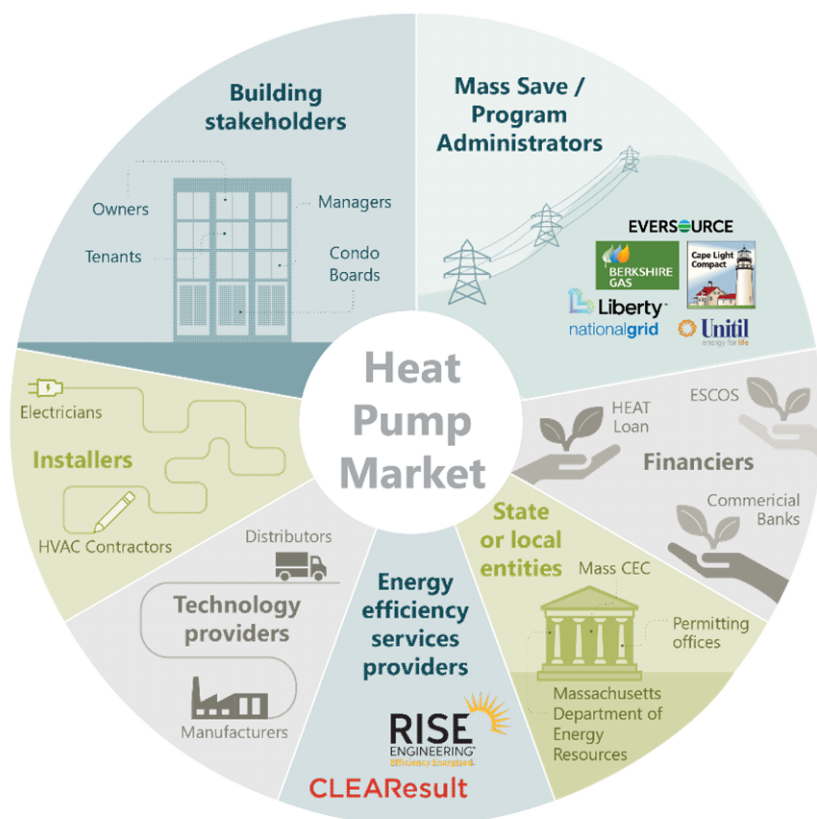
Current Heat Pump Saturation

- 7% for 5+ unit MF buildings
- 6% for 2- to 4-unit buildings
- 11% for single family.

Source: Massachusetts Residential Building Use and Equipment Characterization Study



Market Actor Ecosystem



- Contractors – key player
- Distributor – manufacturer specific or wholesale
- PA's vendors – field insight

Findings - Barriers

Tier 1

Tier 2

Tier 3

Tier 1 Barriers



Greater complexity of MF installations

Relevant to:	Narrative	Considerations
Contractors	<ul style="list-style-type: none">Limited space at MF properties	<ul style="list-style-type: none">Hold MF specific installation workshops for each heat pump technologyLeverage distributor support
Distributors	<ul style="list-style-type: none">Locating compressors often only possible in difficult-to-access areas	
Electricians	<ul style="list-style-type: none">Greater challenges accessing, modifying, or installing MF ductwork	

Tier 1 Barriers (2)



Contractors are still uncomfortable with heat pumps

Relevant to:	Narrative	Considerations
Contractors	<ul style="list-style-type: none">• Distributors signaled contractors' lack of education• Bad installations hurt the market – some contractors on refrigerant leakages.• Still concerned about heat pump performance in extreme cold weather• Maturing market	<ul style="list-style-type: none">• Hold contractor training in heat pump technology and technical design

Tier 1 Barriers (3)



Current heat pump incentives are not enough for MF

Relevant to:	Narrative	Considerations
Building Decision Makers	<ul style="list-style-type: none">• Increased equipment and labor cost• Electrical infrastructure upgrades• Low access/awareness of financing options	<ul style="list-style-type: none">• Allow HEAT Loan for MF buildings with residential rate code• Extend the Expanded 2-4 Family Loan offer to small or mid-sized MF buildings• Increase visibility of commercial financing options for large MF buildings

Tier 2 Barriers



MF heat pump projects are based on custom rebates



Building decision-makers are not familiar with heat pumps

Relevant to:	Narrative	Considerations
Contractors Distributors	<p>Distributors mentioned:</p> <ul style="list-style-type: none"> • Complex and time-consuming process • Large amount of paperwork and lack of clarity of the process make it hard to capture all savings 	<ul style="list-style-type: none"> • Streamline the process • Include part prescriptive rebates
Contractors	<ul style="list-style-type: none"> • Lack of knowledge was the second largest barrier among building decision-makers • 2/3 slightly or not at all familiar with HPs • Twice as many respondents selected poor performance in extreme weather vs good performance in any weather • Lack of trust in heat pumps • Contractor often educates customers 	<ul style="list-style-type: none"> • Develop case studies of retrofit MF buildings • Create a “climate champion campaign” • Continue to promote heat pumps

Tier 3 Barriers



No rebates for natural gas replacement



Aesthetics concerns

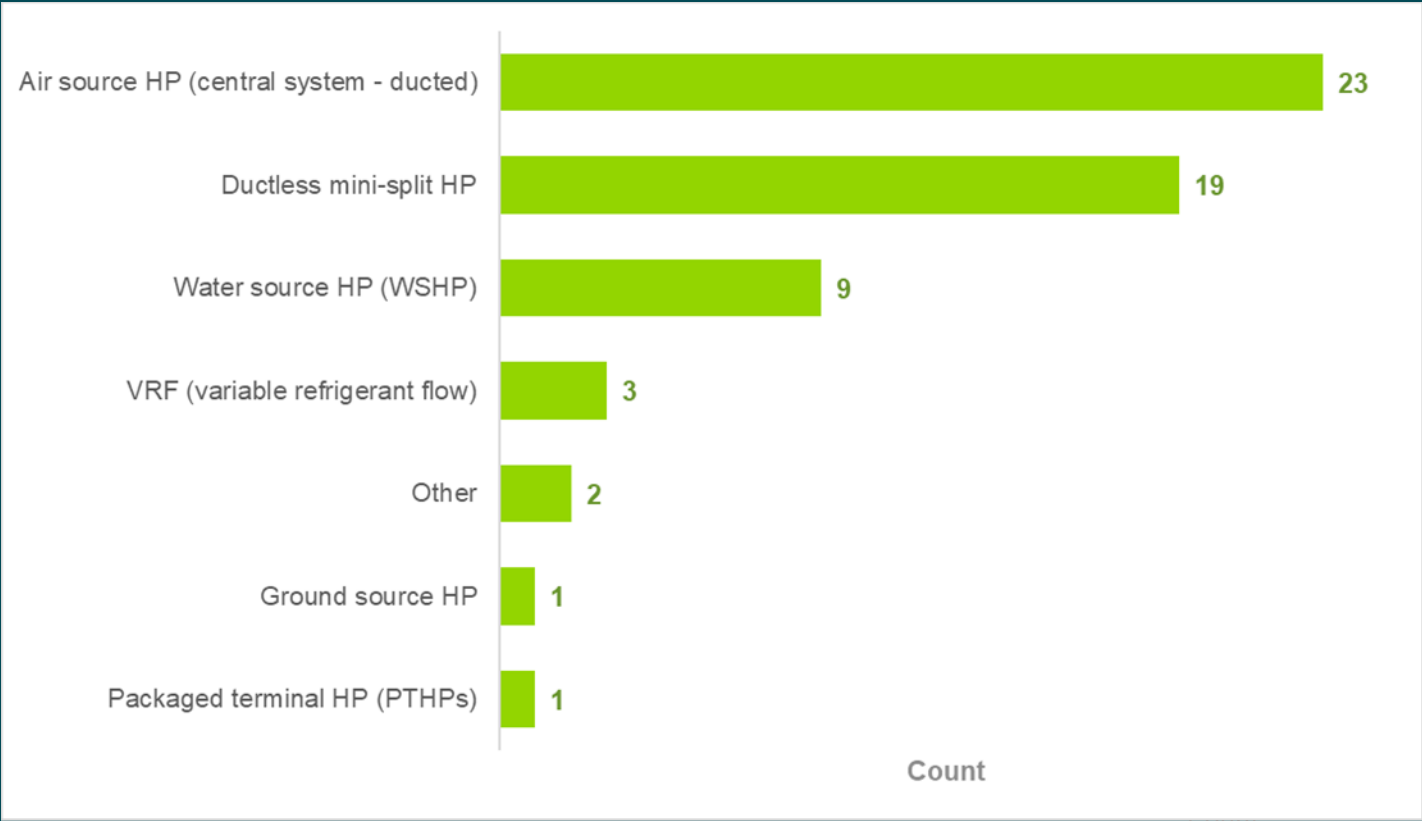


Local regulations and building guidelines

Relevant to:	Narrative	Considerations
Contractors Distributors	Contractors mentioned: <ul style="list-style-type: none"> • Full replacement rebates are available for oil, propane and electric systems. • Cheap gas prices make no economic sense for installing heat pumps without rebates 	<ul style="list-style-type: none"> • Include rebates for gas replacement
Building Decision Makers Occupants	<ul style="list-style-type: none"> • Ugly look of compressors on the outside or inside units hanging on the wall 	<ul style="list-style-type: none"> • Continue heat pump marketing to promote customer visual habituation to the technology
Contractors Distributors Building Decision Makers	<ul style="list-style-type: none"> • Zoning regulation on noise • ASHRAE refrigerant ratio to room size requirement • Building guidelines not allowing compressor to hang on outside of walls 	<ul style="list-style-type: none"> • Work with municipalities to amend zoning regulations on noise

Additional findings

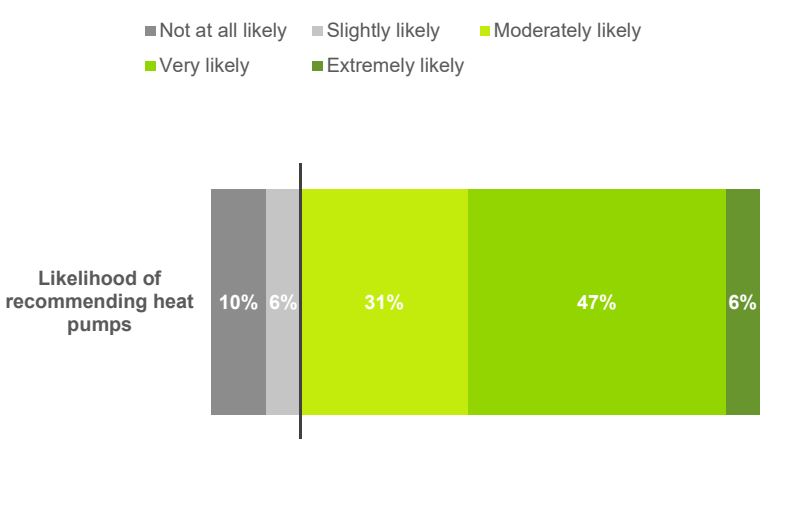
Type of heat pumps among respondents



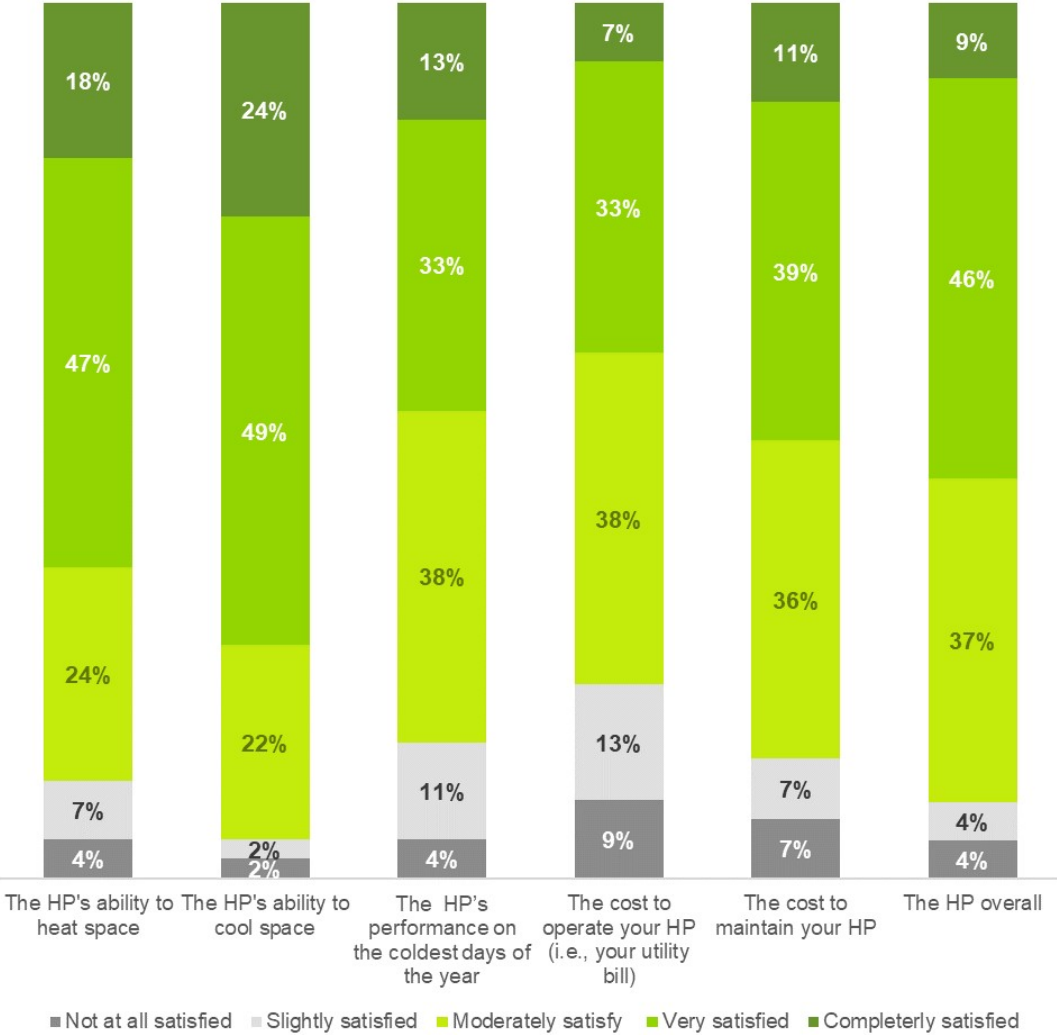
Reasons for installing heat pumps



Likelihood of recommending heat pumps



Heat pump satisfaction



Questions

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