

DOCKETED

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Scaling California's Heat Pump Market

- Dave Lis, Director, Technology and Market Solutions
- California Energy Commission Workshop: Heat Pump Goals, Supply Chain, & Programs
- April 5, 2022



Northeast Energy Efficiency Partnerships



Mission

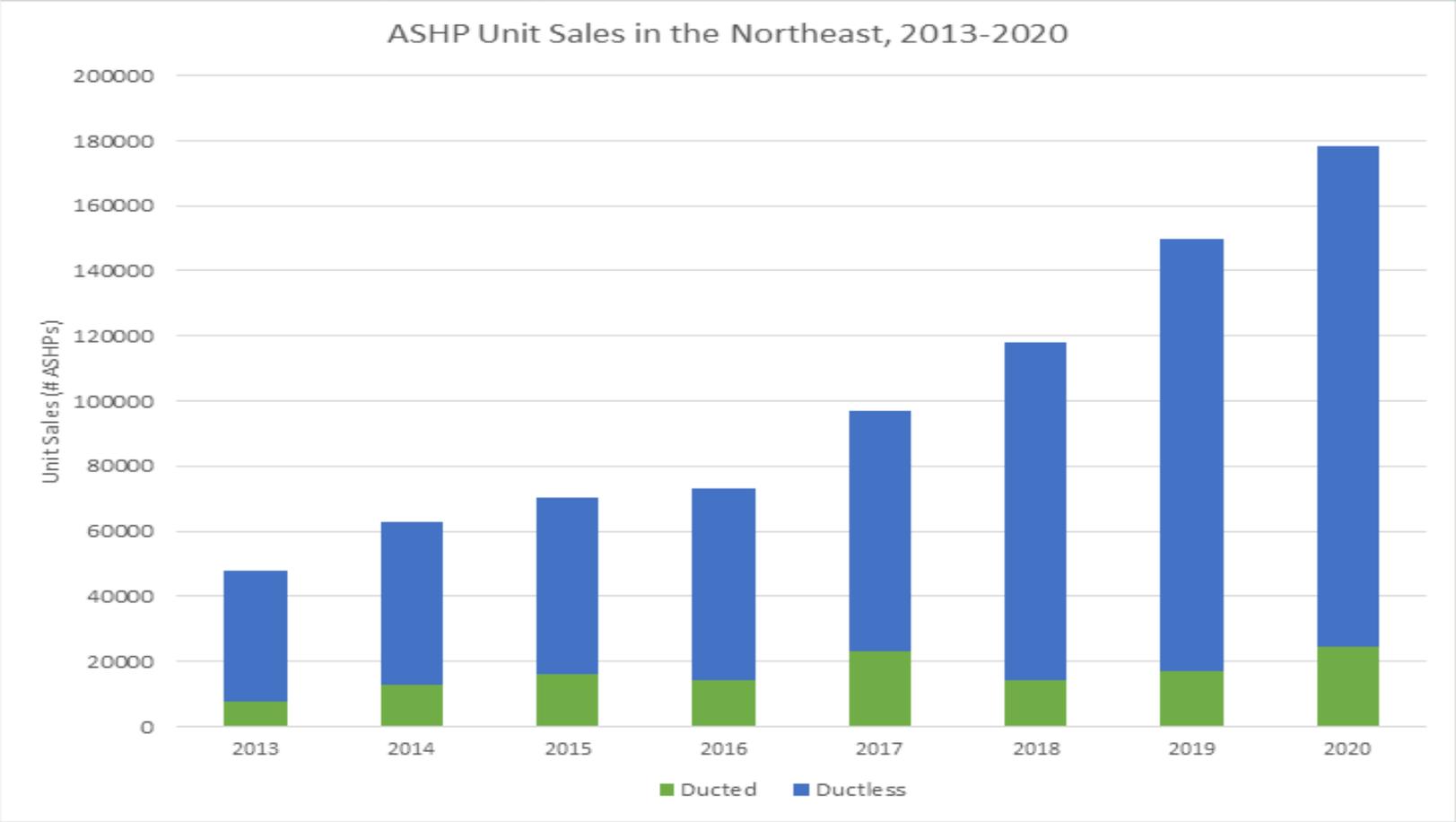
We seek to accelerate regional collaboration to promote advanced energy efficiency and related solutions in homes, buildings, industry, and communities.

Approach

Drive market transformation regionally by fostering collaboration and innovation, developing tools, and disseminating knowledge



Market Momentum Building



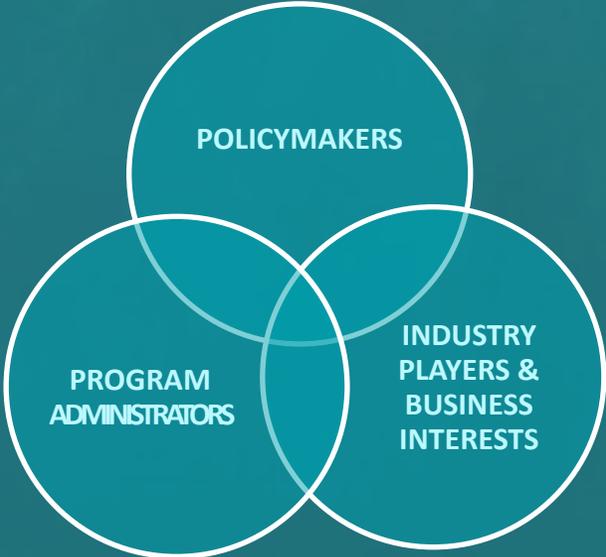
Sales in context

- Furnaces (235k)
- Boilers (160k)
- Central AC (220k)

Contributing Factors to Growth



Regional Heating Electrification Initiative



Current Market Transformation Strategies



1. Increase Consumer Education and Awareness

2. Increase Installer/Builder Awareness of, and Confidence in, ASHP through expanded training and education

3. Reduce Upfront Costs of installed systems through robust and aligned promotional programs and the support of alternative business models

4. Mobilize State and Local Policymakers to expand support for ASHPs

5. Promote Advanced Control technologies to allow automated coordination among multiple heating systems

6. Enable the promotion of climate-appropriate ASHPs through Improved Performance Metrics

7. Develop more accurate tools to predict energy, cost and GHG savings associated with ASHP installation through collection and analysis of Real World Performance Data

Hurry up...Slowly

- Balancing Speed and Quality
- Classic emerging technology challenge



Supporting Policies



- State Targets
- Fuel switching policies for EE programs
- Alternative Portfolio Standards (on Utility)
- New Construction codes/standards
- Workforce funding

Model Program elements

- Robust Downstream and Midstream incentives
- Consumer Education
- Workforce Education/Support
- Displacement vs. Whole home/building
- Quality Assurance elements
- Performance/market/program research

Looking ahead at Policies and Programs

- Ensuring Equitable adoption
- Building Performance Standards
- Clean Heat standards
- Emission-based standards
- Financing+ program implementer+ incentives+ BPS (Ithaca model)
- Supporting refrigerant transition
- Gas customer economics
- Leveraging Federal Infrastructure funding

Supporting emerging heat pump applications

- Packaged Terminal heat pumps
- Window/room heat pumps
- Packaged Roof-top Units (RTU)
- Reverse cycle chillers (Air to water heat pumps)

Opportunities for Collaboration

- Regional Energy Efficiency Organizations (REEOs)
- DOE/EPA/National Labs
- Consortium for Energy efficiency
- NASEO
- NGOs (Building Decarbonization Coalition, etc)

THANK YOU!

Dave Lis

djlis@neep.org

81 Hartwell Avenue, Lexington, MA 02421

P: 781.860.9177 X127

www.neep.org

NEEP's Cold-Climate ASHP Product List

ashp.neep.org



One-stop-shop for cold-climate qualified air source heat pumps

Brand: All Brands | Model #, AHRI #, Unit #: AHRI, Model or Ur | Ducting Configuration: All Configuratic

Heating Capacity (Rated Btu/hr @47°F): 0 to 80000 | Heating Capacity (Max Btu/hr @5°F): 0 to 80000

10 > (5067 Heat Pumps) | Grid View | List View | Download Product List

TRANE
XV20i
AHRI #: **8935201**
Outdoor Unit #: **4TWV0024A1**
Indoor Unit #: **4PX*BD36BS3**
Singlezone Ducted, Centrally Ducted
🔥 **12,880** Max Btu/hr @5°F
🔥 **22,200** Rated Btu/hr @47°F
❄️ 24,400 Rated Btu/hr @95°F
COP @5°F: **1.91**
HSPF: **10**

[VIEW DETAIL](#)

TRANE
XV19
AHRI #: **201923126**
Outdoor Unit #: **4TWL9024A1**
Indoor Unit #: **4PX*CU60BS3**
Singlezone Ducted, Centrally Ducted
🔥 **10,520** Max Btu/hr @5°F
🔥 **20,400** Rated Btu/hr @47°F
❄️ 25,000 Rated Btu/hr @95°F
COP @5°F: **2.49**
HSPF: **11**

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TRANE
XV19
AHRI #: **201922963**
Outdoor Unit #: **4TWL9024A1**
Indoor Unit #: **4PX*CU48BS3**
Singlezone Ducted, Centrally Ducted
🔥 **10,680** Max Btu/hr @5°F
🔥 **20,400** Rated Btu/hr @47°F
❄️ 24,400 Rated Btu/hr @95°F
COP @5°F: **2.52**
HSPF: **11.5**

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Now 25,000+ systems from over 80 major brands

DAIKIN MXS Series
Multizone All Non-ducted
AHRI Cert #: **201851579**
Outdoor Unit #: **4MXS36RMVJU**
Indoor Unit #:

🔥 Maximum Heating Capacity (Btu/hr) @5°F: **22,610**
🔥 Rated Heating Capacity (Btu/hr) @47°F: **36,000**
❄️ Rated Cooling Capacity (Btu/hr) @95°F: **36,000**

Information Tables		Performance Specs						
Brand	DAIKIN	Heating / Cooling	Outdoor Dry Bulb	Indoor Dry Bulb	Unit	Min	Rated	Max
Series	MXS Series	Heating	5°F	70°F	Btu/h	4,780	-	22,610
Ducting Configuration	Multizone All Non-ducted				kW	0.4	-	2.68
AHRI Certificate No.	201851579				COP	3.5	-	2.47
Outdoor Unit #	4MXS36RMVJU	Heating	17°F	70°F	Btu/h	5,920	22,000	26,840
Indoor Unit Type	Non-Ducted Indoor Units				kW	0.42	2.7	3.75
Indoor Unit #					COP	4.13	2.39	2.1
Furnace Unit #		Heating	47°F	70°F	Btu/h	9,100	36,000	43,000
SEER	17.7				kW	0.43	2.34	3.24
EER	9.2				COP	6.2	4.51	3.89
HSPF Region IV	12.2	Cooling	82°F	80°F	Btu/h	10,770	-	40,540
Energy Star					kW	0.55	-	3.63
Variable Capacity	✔️				COP	5.74	-	3.27
Turndown Ratio (Max 5°F/Min 47°F)	2.48	Cooling	95°F	80°F	Btu/h	10,100	36,000	38,000
Capacity Maintenance (Max 5°F/Max 47°F)	52%				kW	0.59	3.91	3.94
Capacity Maintenance (Rated 17°F/Rated 47°F)	61%				COP	5.02	2.7	2.83
Capacity Maintenance (Max 5°F/Rated 47°F)	62%							
Integration								
Connectivity								
Operational Diagnostics								
Refrigerant(s)								

Heating/Cooling Capacity Graph

Outdoor Temperature (°F)	Heating Capacity (Btu/hr)	Cooling Capacity (Btu/hr)
5	~22,610	~36,000
17	~22,000	~36,000
47	~10,770	~36,000
82	~9,100	~36,000
95	~9,100	~36,000

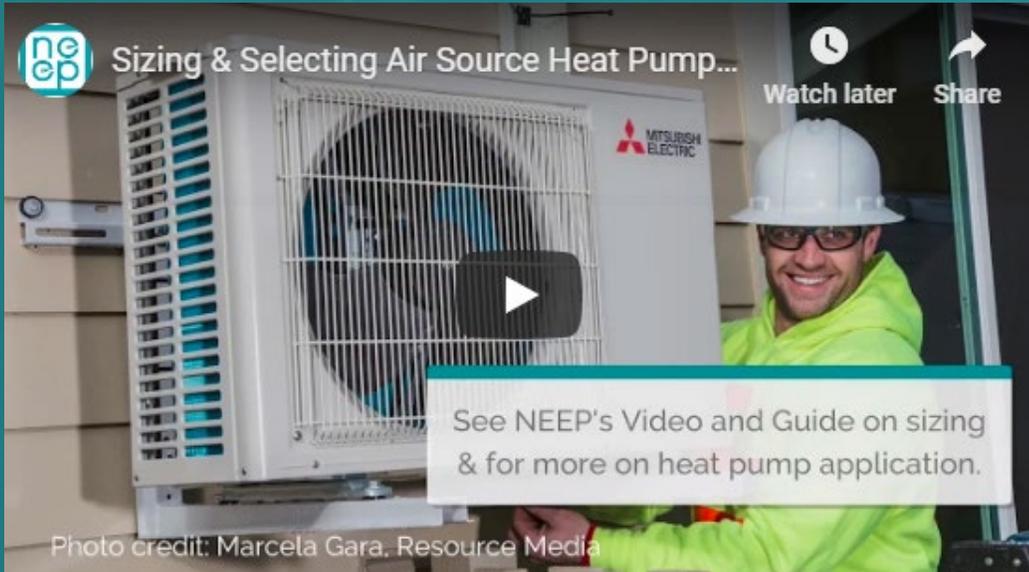
Consumer Resources – NEEP Air Source Heat Pump Buying Guide



- Good resource for all audiences
- Especially for consumers who are looking to learn more about heat pumps
- Check out the O&M guide and Case Studies too

Air Source Heat Pump Buying Guide

Design and Installation Resources



neep.org/ASHPIInstallerResources

Air-Source Heat Pump Technology (R)Evolution



- Not your grandparents ASHP
 - Variable capacity compressors (inverter driven)
 - Sophisticated controls
 - Flash injection
- Delivering capacity and efficiency at low outdoor temperatures
- Air-to-Air- ducted, ductless and everything in between
- Air-to-Water – Variety of distribution options



Air Source Heat Pump Configurations

