

DOCKETED

Docket Number:	22-DECARB-01
Project Title:	Heat Pump and Decarbonization Goals
TN #:	242589
Document Title:	Presentation - Scaling California's Heat Pump Market
Description:	Presentation from Dave Lis (NEEP)
Filer:	Gabriel Taylor
Organization:	Northeast Energy Efficiency Partnerships (NEEP)
Submitter Role:	Public
Submission Date:	4/6/2022 3:17:18 PM
Docketed Date:	4/6/2022



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

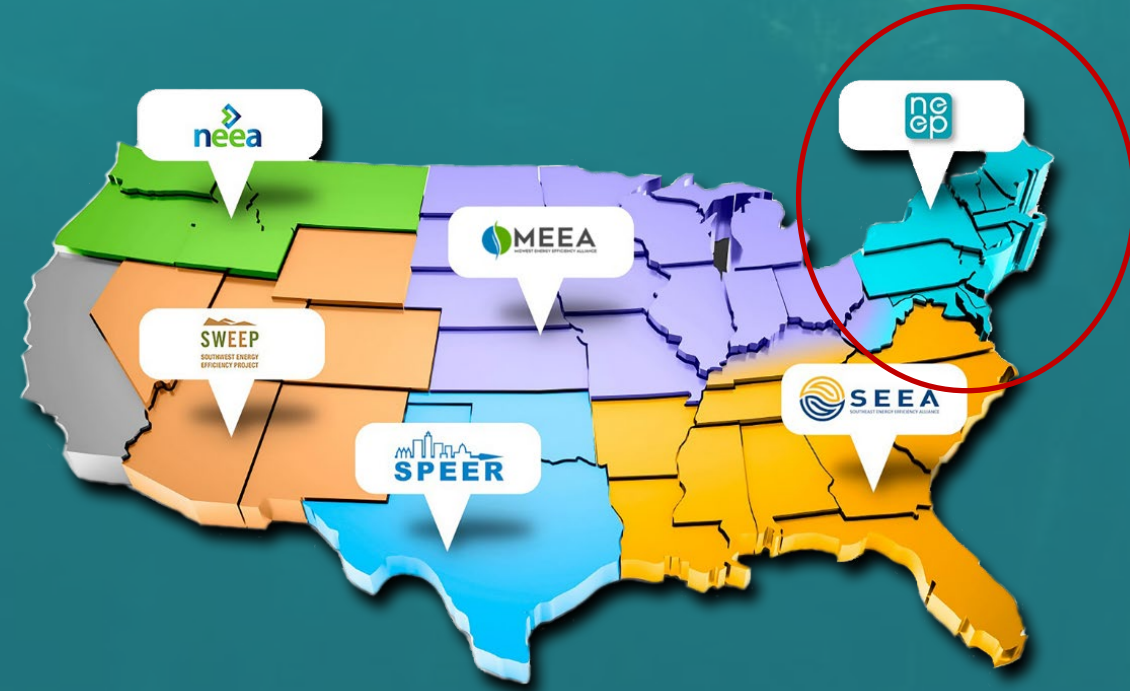


Mission

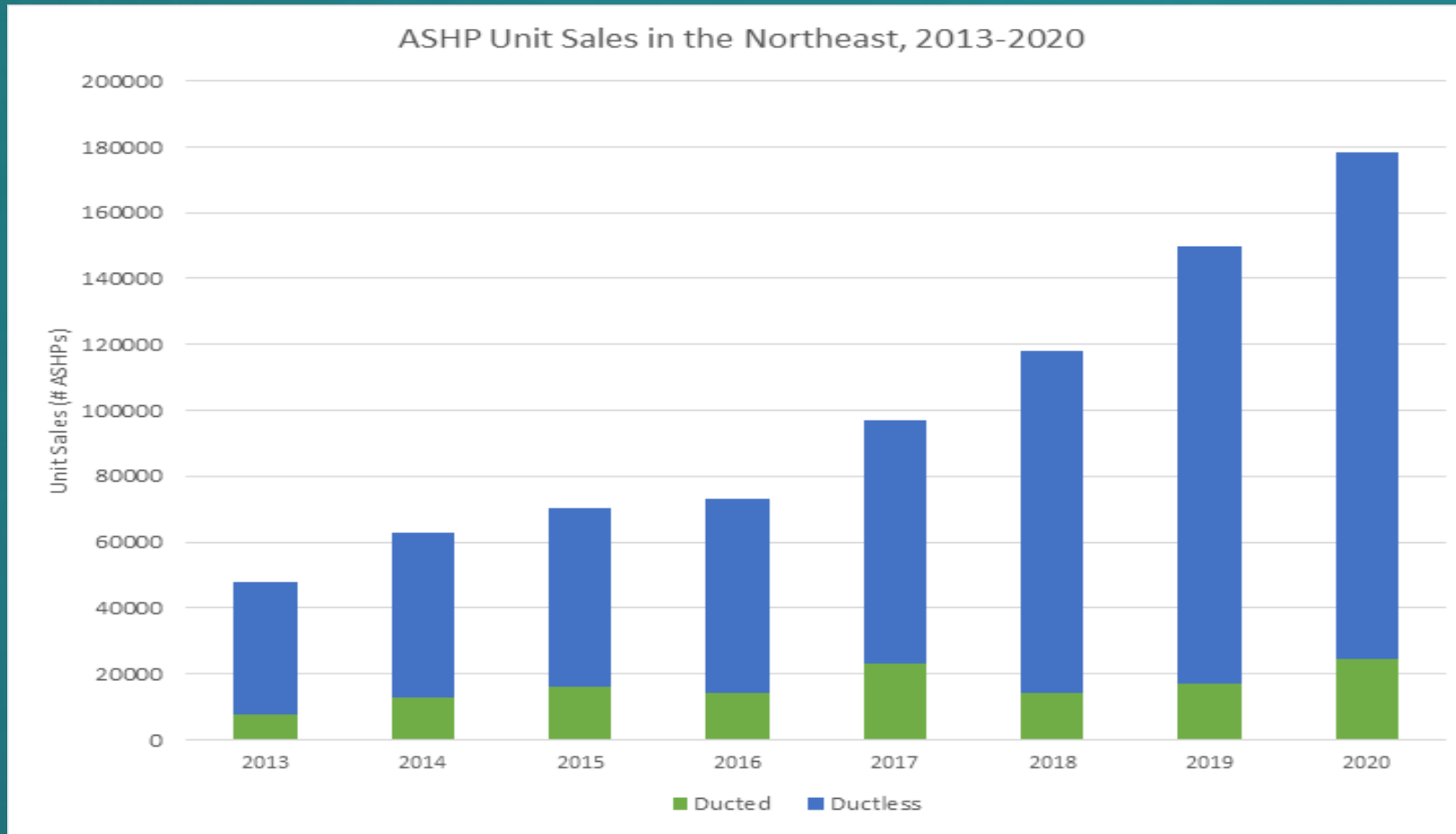
We seek to accelerate regional collaboration to promote advanced energy efficiency and related solutions in homes, buildings, industry, and communities.

Approach

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



Market Momentum Building



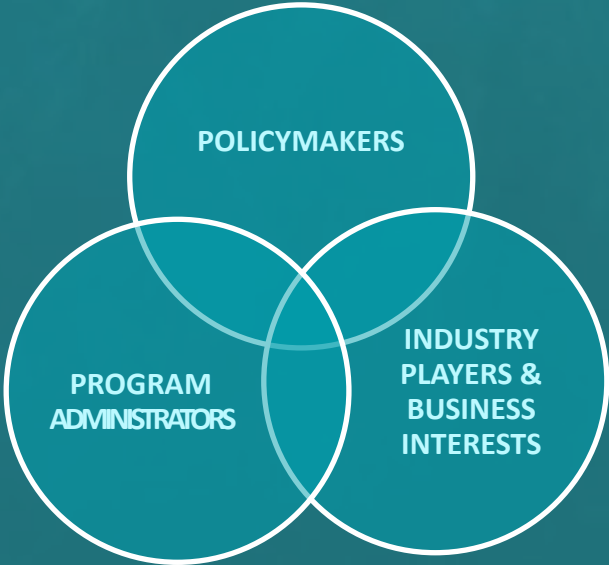
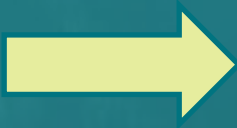
Sales in context

- 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)

080000


Heating Capacity (Max Btu/hr @5°F)

080000

10 > (5067 Heat Pumps)


Grid ViewList 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

VIEW DETAIL




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


VIEW DETAIL



TRANE



TRANE



TRANE

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

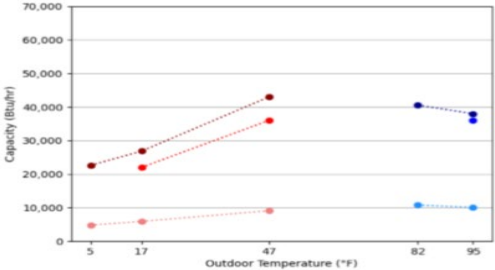
Information Tables

Brand	DAIKIN
Series	MXS Series
Ducting Configuration	Multizone All Non-ducted
AHRI Certificate No.	201851579
Outdoor Unit #	4MXS36RMVJU
Indoor Unit Type	Non-Ducted Indoor Units
Indoor Unit #	
Furnace Unit #	
SEER	17.7
EER	9.2
HSPF Region IV	12.2
Energy Star	
Variable Capacity	✓
Turndown Ratio (Max 5°F/Min 47°F)	2.48
Capacity Maintenance (Max 5°F/Max 47°F)	52%
Capacity Maintenance (Rated 17°F/Rated 47°F)	61%
Capacity Maintenance (Max 5°F/Rated 47°F)	62%
Integration	
Connectivity	
Operational Diagnostics	
Refrigerant(s)	

Performance Specs

	Heating / Cooling	Outdoor Dry Bulb	Indoor Dry Bulb	Unit	Min	Rated	Max
Heating	5°F	70°F	Btu/h	4,780	-	22,610	
			kW	0.4	-	2.68	
			COP	3.5	-	2.47	
Heating	17°F	70°F	Btu/h	5,920	22,000	26,840	
			kW	0.42	2.7	3.75	
			COP	4.13	2.39	2.1	
Heating	47°F	70°F	Btu/h	9,100	36,000	43,000	
			kW	0.43	2.34	3.24	
			COP	6.2	4.51	3.89	
Cooling	82°F	80°F	Btu/h	10,770	-	40,540	
			kW	0.55	-	3.63	
			COP	5.74	-	3.27	
Cooling	95°F	80°F	Btu/h	10,100	36,000	38,000	
			kW	0.59	3.91	3.94	
			COP	5.02	2.7	2.83	

Heating/Cooling Capacity Graph



Outdoor Temperature (°F)	Heating Capacity (Btu/hr) @ 5°F	Heating Capacity (Btu/hr) @ 17°F	Cooling Capacity (Btu/hr) @ 95°F
5	4,780	-	-
17	5,920	22,000	-
47	9,100	36,000	-
82	-	-	10,770
95	-	-	10,100

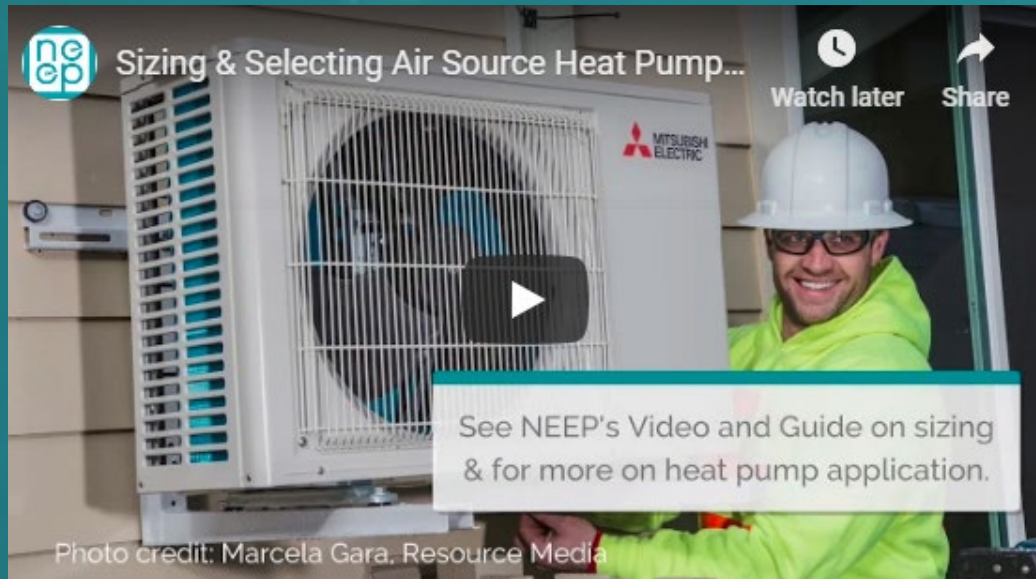
Consumer Resources – NEEP Air Source Heat Pump Buying Guide



- 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

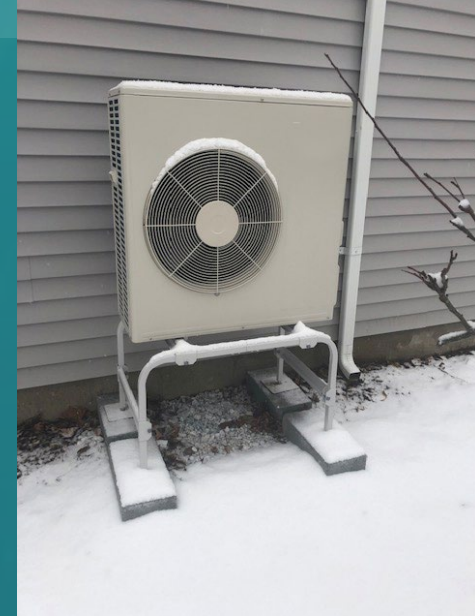


neep.org/ASHPInstallerResources

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

