



# NEEP's Air Source Heat Pump and Smart Controls Initiative - How and Why of Engagement

- Presented by Dave Lis, Director, Technology and Market Solutions



# Purpose of today's webinar

## Provide stakeholders:

- A greater understanding of NEEP's work to facilitate transformation of the HVAC market, via Air Source Heat Pumps
- Clear direction for how to engage the Initiative going forward

# Northeast Energy Efficiency Partnerships



*“Assist the Northeast and Mid-Atlantic region to reduce building sector energy consumption 3% per year and carbon emissions 40% by 2030 (relative to 2001)”*

## Mission

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

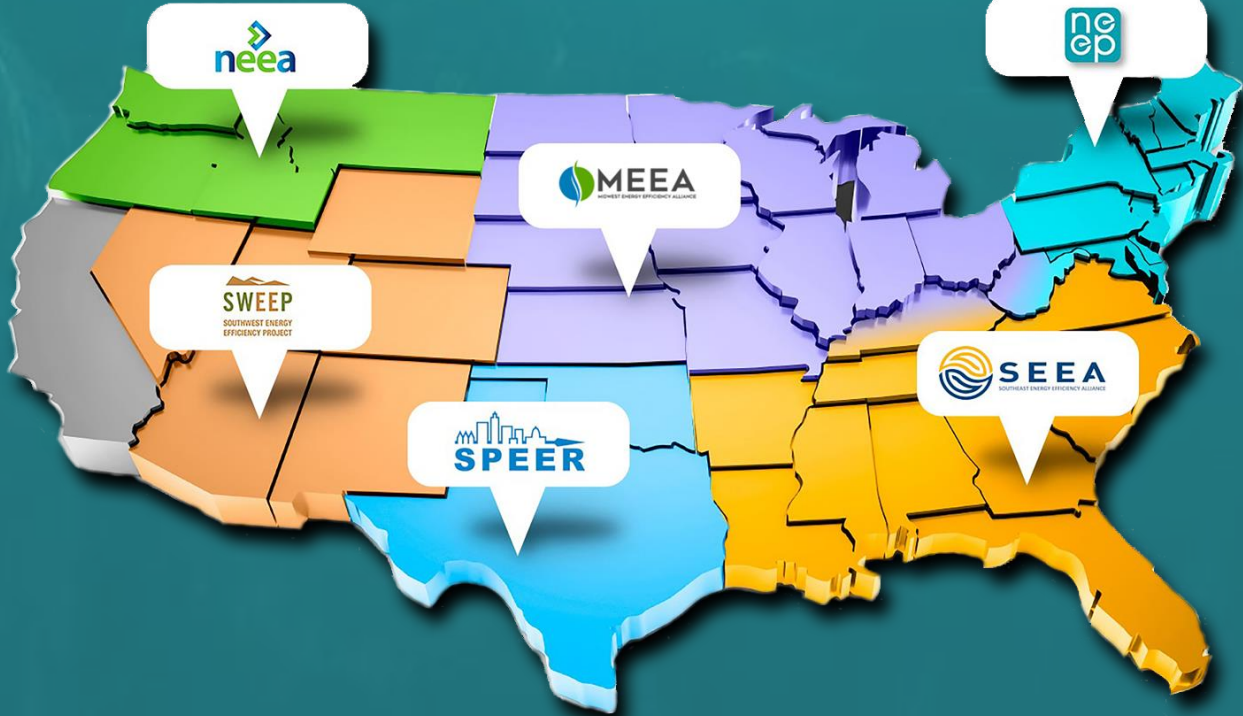
## Approach

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



# About NEEP

A Regional Energy Efficiency Organization



# Meeting Agenda

- Welcome/Opening remarks
- Where have we been with the ASHP initiative?
- What are the drivers for change?
- What is new in NEEP's ASHP initiative?
- How do you stay/get involved?
- Q&A
- Wrap-up

# Webinar Logistics



- Attendees will be muted for the entirety of the webinar
- There will be an opportunities to comment/ask questions. We will ask you to enter questions via chat box on the GoToWebinar sidebar
- Webinar is being recorded and will be made publically available



**Slides will be  
circulated  
following call**

# Launch Poll



- Stakeholder type?
- Current level of engagement with NEEP's ASHP Initiative?

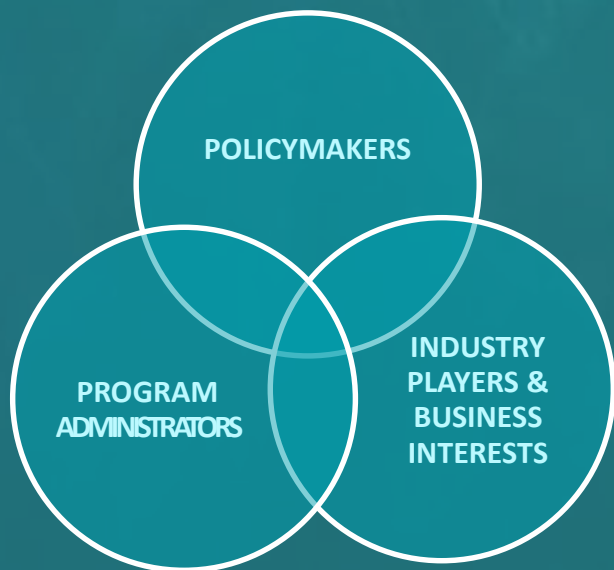


# Initiative history





# Regional ASHP Market Transformation Strategy

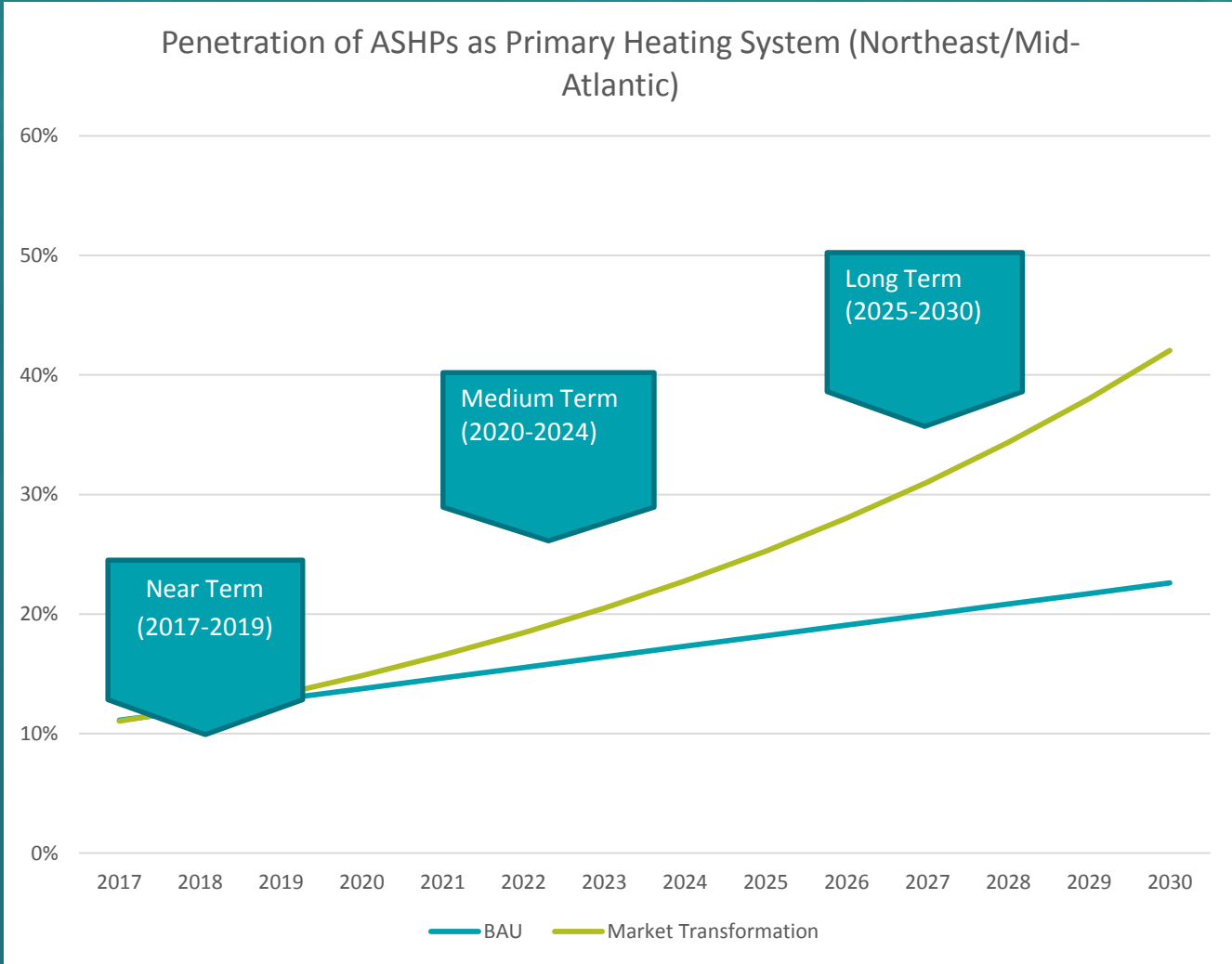


# Market Transformation Strategies



- 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**

# Theory of Change- Accelerated ASHP Adoption



## Key Initiative activities since 2013

- Regional MT Strategy
- Quarterly WG/Market tracking
- Annual Workshops
- Cold-Climate ASHP Specification/product List
- Installer/Consumer resources
- Regional/National Coordination

# ccASHP Specification and Product List

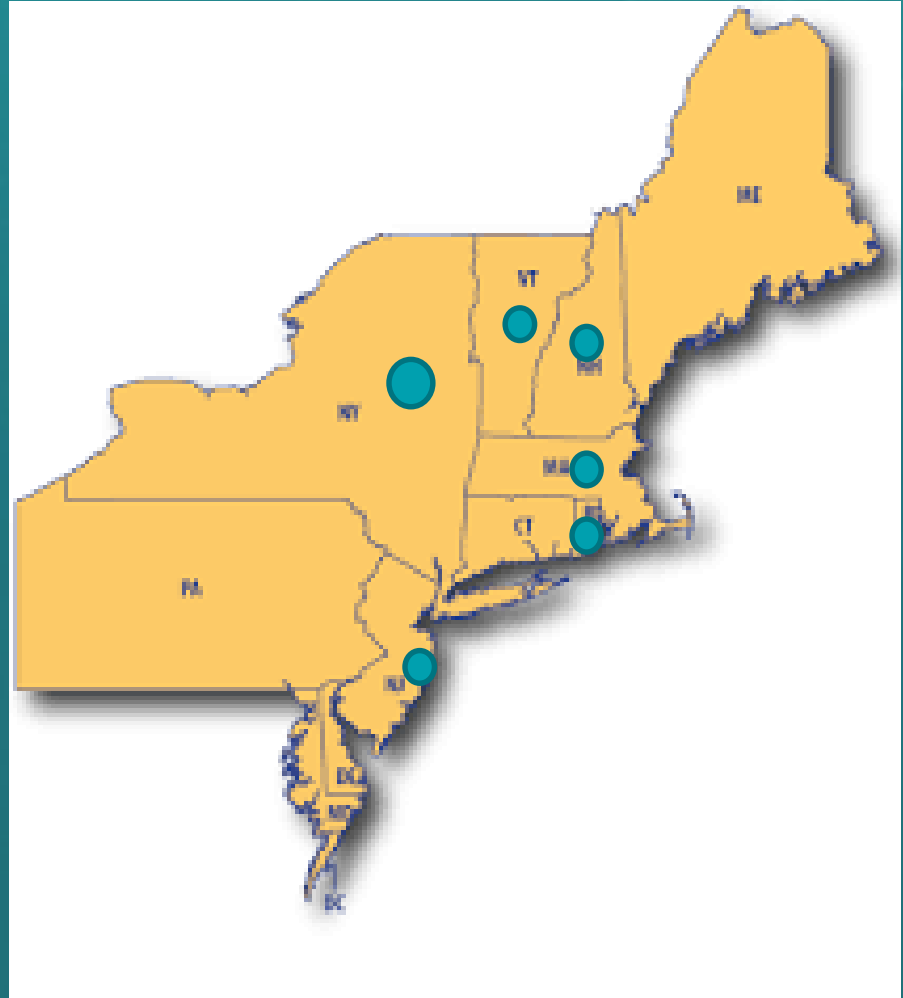


**DISCLAIMER:** Some of the performance values reported as part of the Cool Climate ASHP Specification are NOT derived from industry standard test procedures or third-party tested/verified (i.e. performance values at 5°F).  
 Products added to list since previous update highlighted in pink

Updated: March 9, 2017

General Information													Capacity (btuhr)		
Manufacturer	Brand (if applicable)	AHRI Certificate No.	Outdoor Unit Model	Indoor Unit Model(s)	HSPF (Region N)	SEER	EER (@ 95°F)	ENERGY STAR Certified	Ductless or Ducted	If Ductless, Multi-zone or Single-zone	Minimum Capacity 47°F	Rated Capacity 47°F	Maxim Capa 47°F		
Daikin		3208521	RXZ099VJU	FTXG099VJU	11	26.1	15.8	Yes	Ductless	Single-zone	4,668	12,000	18,670		
Daikin		3208522	RXZ129VJU	FTXG129VJU	10.55	24.2	14	Yes	Ductless	Single-zone	4,668	16,000	19,130		
Daikin		3208523	RXZ159VJU	FTXG159VJU	10	21	12.9	Yes	Ductless	Single-zone	4,668	18,000	21,290		
Mitsubishi		4517888	MUZ-FE19NA	MSZ-FE19NA	10.3	20.2	14.2	Yes	Ductless	Single-zone	7,500	21,600	29,100		
Mitsubishi		4908219	MUZ-FE09NA	MSZ-FE09NA	10	26	15.5	Yes	Ductless	Single-zone	3,000	10,900	18,000		
Mitsubishi		4904170	MUZ-FE12NA	MSZ-FE12NA	10.5	23	12.9	Yes	Ductless	Single-zone	3,000	13,600	21,000		
Fujitsu		5003325	AOU19RLS2	ASU19RLS2	12.5	27.2	19.1	Yes	Ductless	Single-zone	3,100	12,000	22,000		
Fujitsu		5003326	AOU12RLS2	ASU12RLS2	12	25	13.8	Yes	Ductless	Single-zone	3,100	16,000	22,110		
Daikin		5265753	RXZ09L VJU	FTXS09L VJU	12.5	24.5	15.3	Yes	Ductless	Single-zone	4,400	12,000	15,600		
Daikin		5265755	RXZ12L VJU	FTXS12L VJU	12.5	23	12.8	Yes	Ductless	Single-zone	4,800	14,400	18,000		
Daikin		5265756	RXZ15L VJU	FTXS15L VJU	11.6	20.6	14.4	Yes	Ductless	Single-zone	5,800	18,000	22,300		
Daikin		5265757	RXZ18L VJU	FTXS18L VJU	11	20.3	12.7	Yes	Ductless	Single-zone	5,800	21,600	26,700		
Daikin		5265758	RXZ24L VJU	FTXS24L VJU	10.6	20	12.5	Yes	Ductless	Single-zone	7,800	25,600	31,400		
Nortek Global	Maytag	5597453	PSH4B024K	BRVMAX024K-B	10	19	13.9	Yes	Ducted	N/A	10,200	22,400	24,700		
Nortek Global	Maytag	5597457	PSH4B030K	BRVMAX030K-B	10	19	12.9	Yes	Ducted	N/A	16,500	34,400	36,600		
Fujitsu		5751311	AOU19RLFC	AU19RLFC	13	24	14.5	Yes	Ductless	Single-zone	3,100	12,000	18,000		
Fujitsu		5751312	AOU19RLFC	AU19RLFC	12.2	21.5	14.5	Yes	Ductless	Single-zone	3,100	12,000	18,000		
Fujitsu		5751313	AOU12RLFC	AU12RLFC	12.2	21.9	12.8	Yes	Ductless	Single-zone	3,100	16,000	19,400		
Fujitsu		5751314	AOU12RLFC	AU12RLFC	11.5	20	12.8	Yes	Ductless	Single-zone	3,100	16,000	19,400		
LG		5859619	LU187HV	LCN167HV	10.1	20	15	Yes	Ductless	Single-zone	9,300	20,000	22,000		
LG		6236101	LSU240HSV3	LSN240HSV3	10.2	20	12.5	Yes	Ductless	Single-zone	3,070	27,600	38,900		
American Standard		6749789	4AEV0024A1	*AMBC0C36V21	10	19.25	13.75	Yes	Ducted	N/A	7,800	20,200	21,900		
American Standard		6749791	4AEV0048A1	*AMBC0C48V41	10	19.25	12.5	Yes	Ducted	N/A	11,800	42,500	42,600		
Trane		6749942	4TWV0024A1	*AMBC0C36V21	10	19.25	13.75	Yes	Ducted	N/A	7,800	20,200	21,900		
Trane		6749944	4TWV0048A1	*AMBC0C48V41	10	19.25	12.5	Yes	Ducted	N/A	11,800	42,500	42,600		
American Standard		6750232	4AEV8036A1	*AMBC0C36V31	10	18	13	Yes	Ducted	N/A	8,200	32,200	32,200		
American Standard		6750233	4AEV8048A1	*AMBC0C48V41	10	18	12.5	Yes	Ducted	N/A	11,800	41,000	43,000		

Current Product List (3.9.17) | Deleted on 3.3.17





# Annual Workshops



# 2018 ASHP Installer Guides



- Updated Existing guides (Installation and Sizing/Selecting) with improved content and format

- Developed video versions of these Guides

The image shows the cover of a guide titled "Guide To Installing Air-Source Heat Pumps in Cold Climates". The cover features the NEEP logo and the title in a bold, sans-serif font. Below the title is a subtitle: "A Companion to NEEP's Guide to Sizing & Selecting Air-Source Heat Pumps in Cold Climates". The cover is divided into sections: "Introduction" with a paragraph of text, and "Applies to:" followed by three icons representing different ASHP configurations: Ductless ASHP, Compact-ducted ASHP, and Centrally ducted ASHP.

**neep** Guide To Installing Air-Source Heat Pumps in Cold Climates  
*A Companion to NEEP's Guide to Sizing & Selecting Air-Source Heat Pumps in Cold Climates*

**Introduction**

High-quality installations of air-source heat pump (ASHP) systems generate referrals, increase sales, reduce callbacks and improve customer comfort and satisfaction. Installation practices also have a major impact on efficiency and performance of an ASHP system. Efficient ASHPs have seen significant sales growth in colder climates in recent years. This guide provides a list of minimum requirements and best practices, as well as homeowner education and system setup guidance, to help ensure efficient air-source heat pumps and happy customers in cold climates.

Heat pumps should always be installed by licensed, trained professionals. Always follow manufacturer's specification and installation instructions, and all applicable building codes and regulations. All installers should attend a manufacturer's training or preferred installer program.

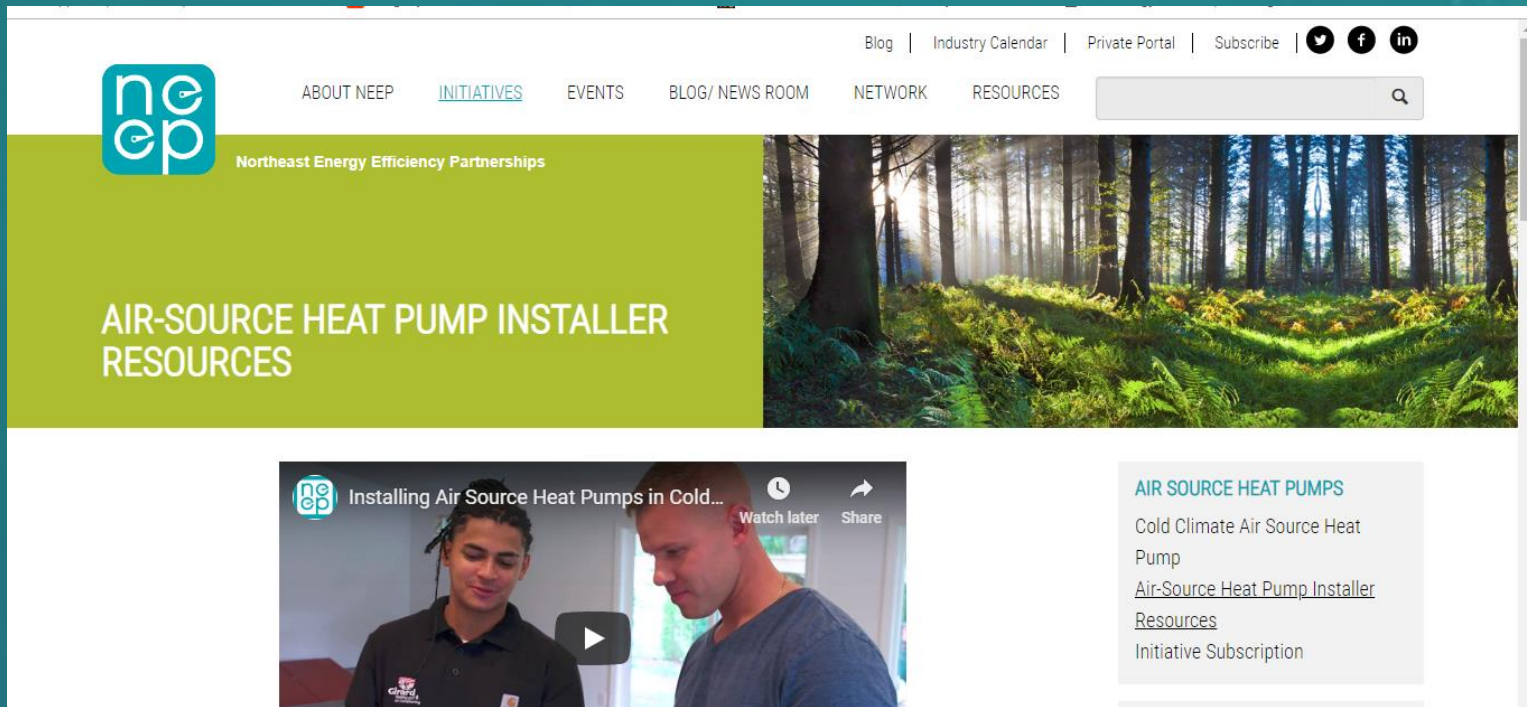
ASHPs come in a number of configurations, and in some cases the following guidance may be specific to one or more of those system types. There are many variations and terms used, but these guidelines will focus on the following broad categories: "ductless ASHP" refers to any non-ducted cassette type indoor unit (including wall-mount air handlers, floor mounted consoles, in-ceiling cassettes, etc.); "compact-ducted ASHP" refers to remote air handlers that are typically designed for compact, concealed-ceiling or short-duct configurations; and "centrally ducted ASHP" refers to whole-house systems with central air handlers. The icons shown here are used below to indicate when guidance is specific to a certain system type. All items without icons are generally applicable to all ASHP configurations.

Applies to: Ductless ASHP Compact-ducted ASHP Centrally ducted ASHP



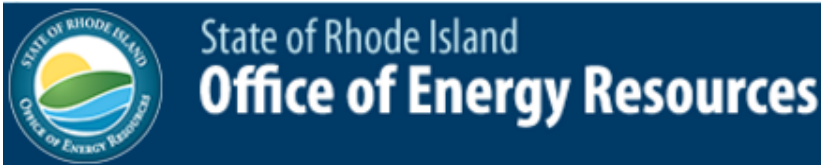
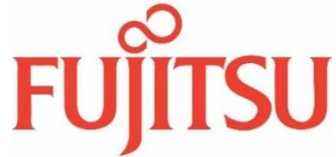


# Installer/Consumer Resources



Go to; [www.neep.org/ASHPInstallerResources](http://www.neep.org/ASHPInstallerResources)  
Need your help in driving use!

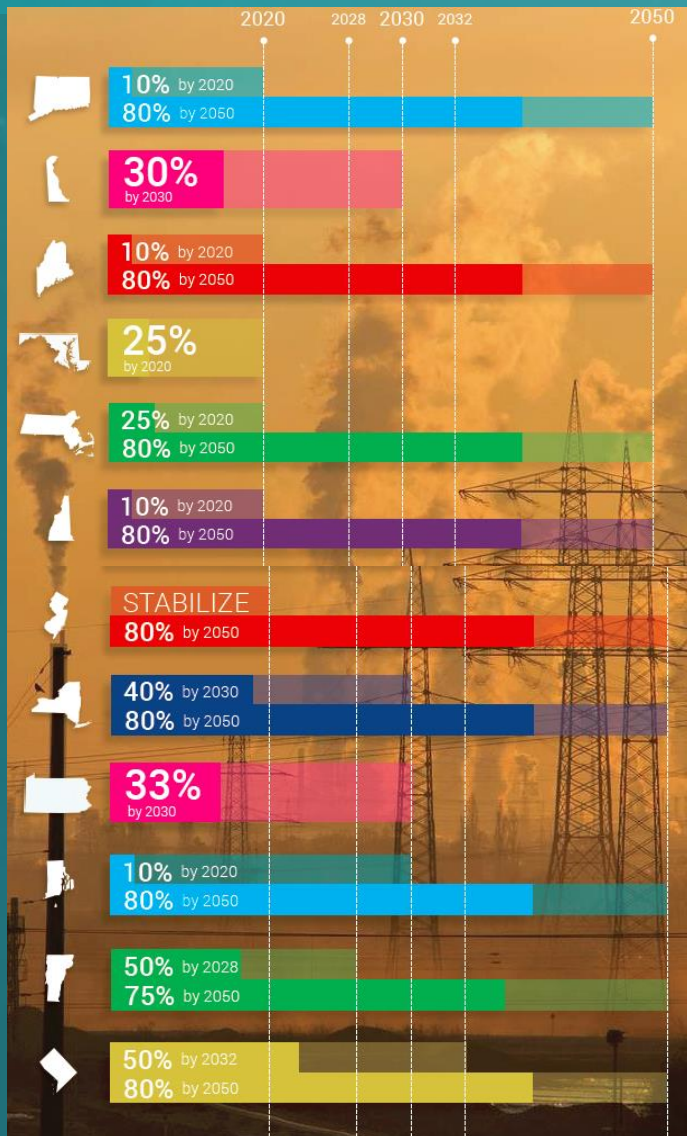
# Thank you to our 2018 ASHP Initiative Funders:



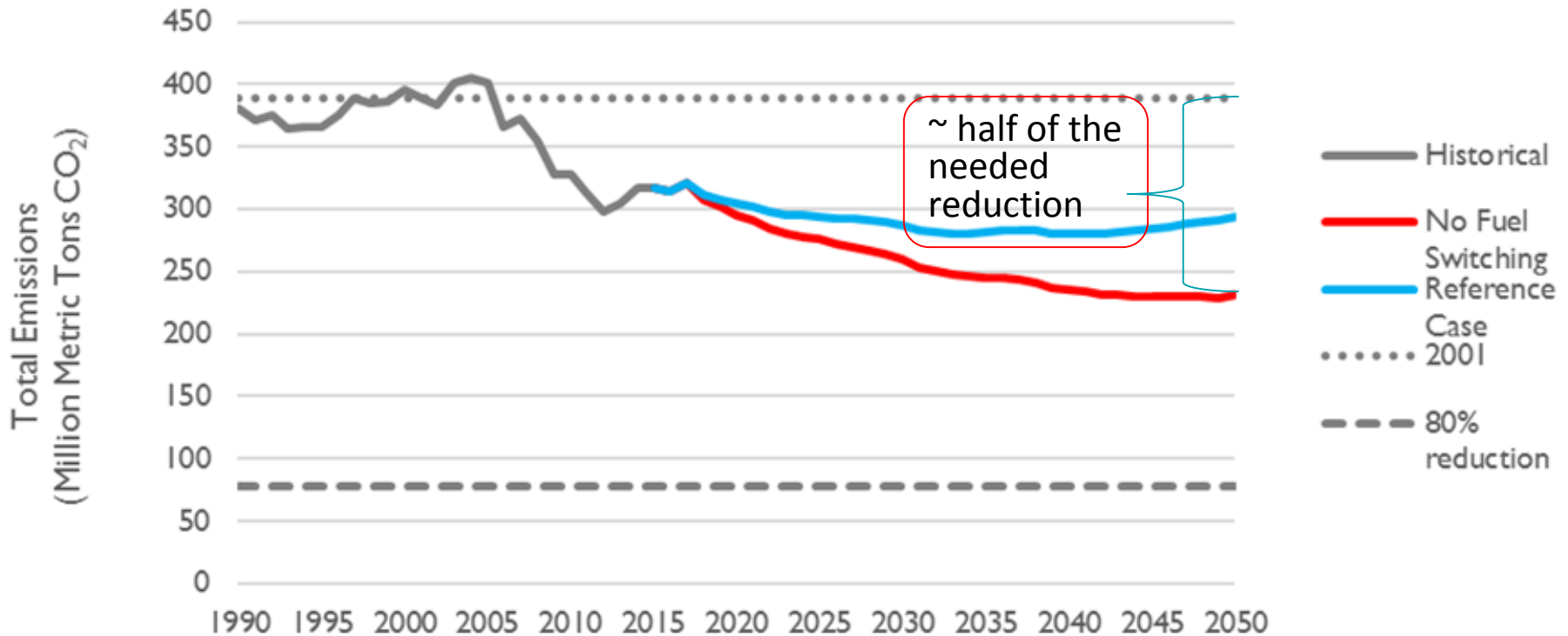
# Drivers for Change.....



# Region's Aggressive Carbon Reduction Targets

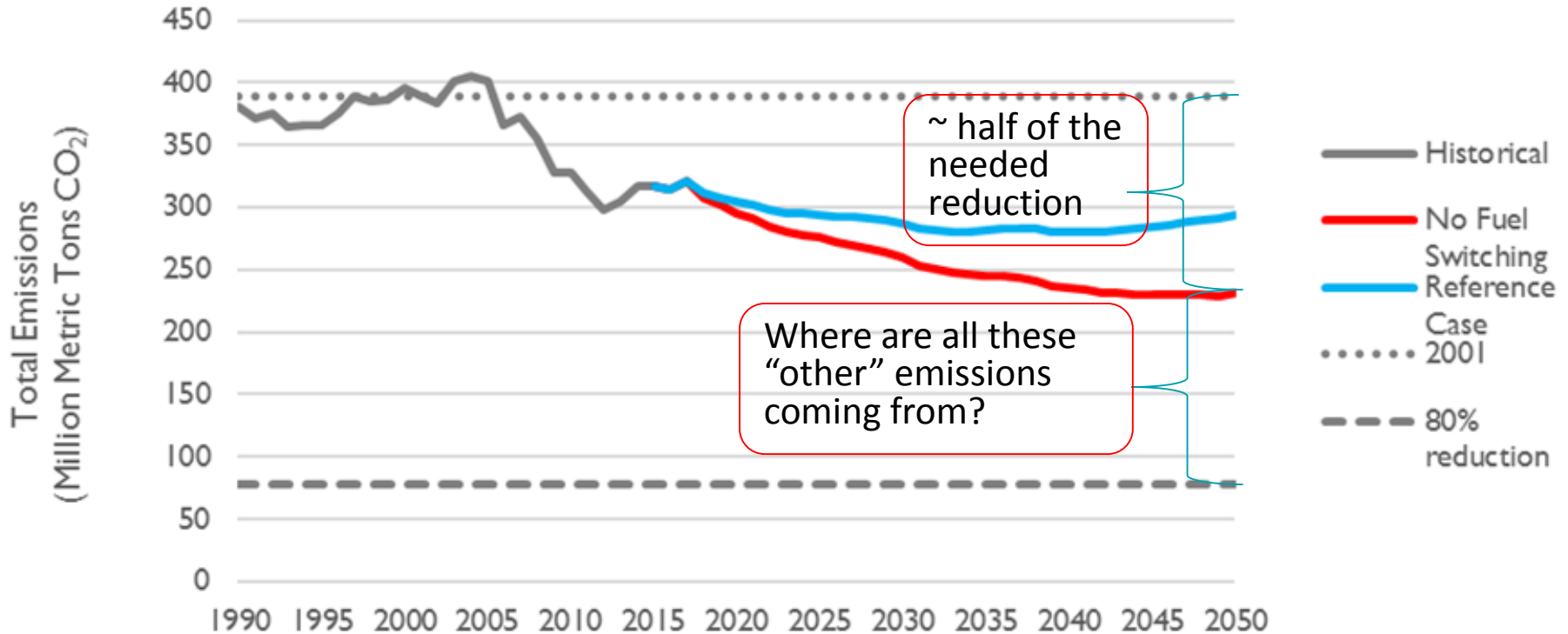


# Aren't we on the path to 80% CO<sub>2</sub> reductions?

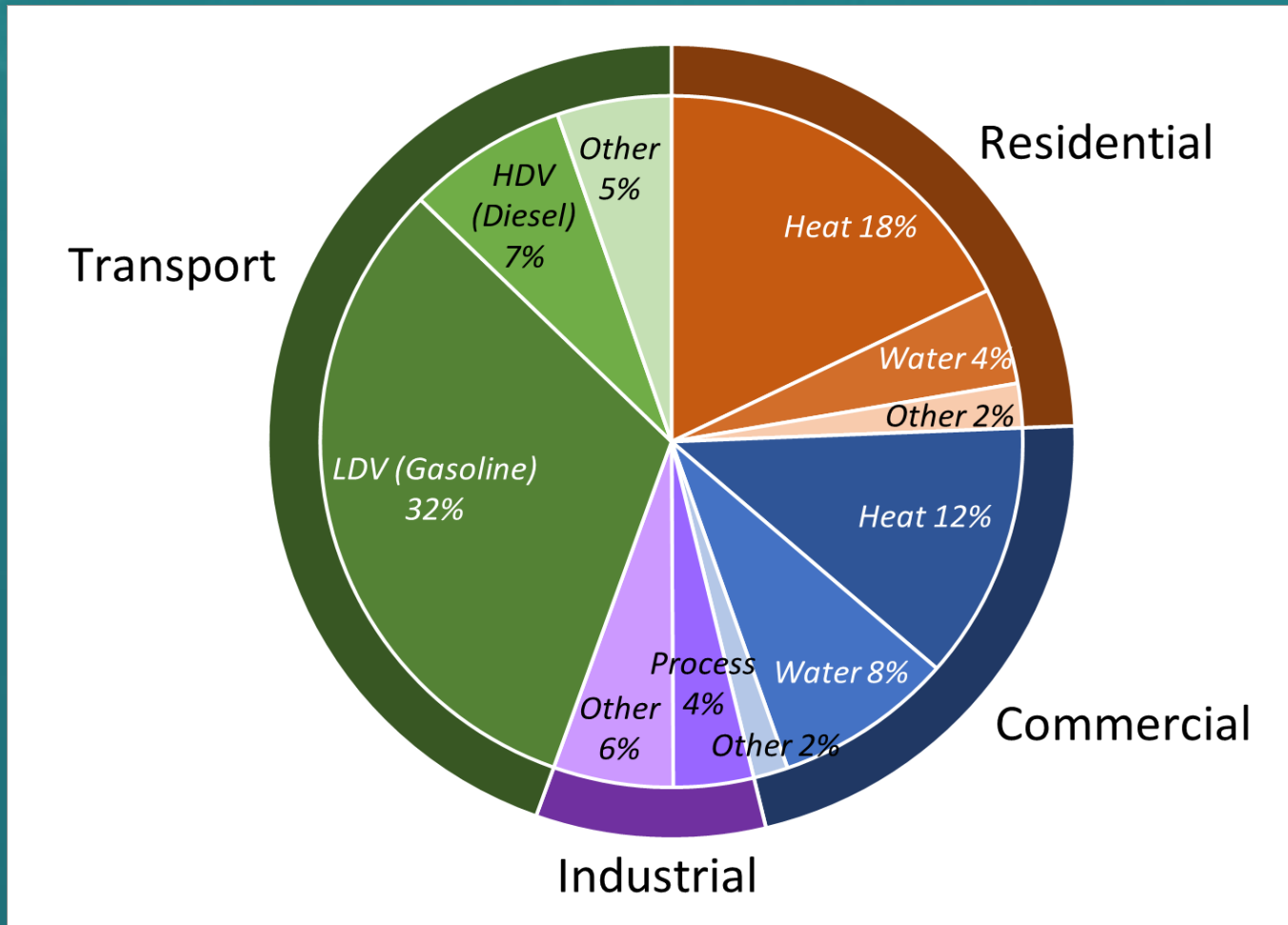




# Aren't we on the path to 80% CO2 reductions?

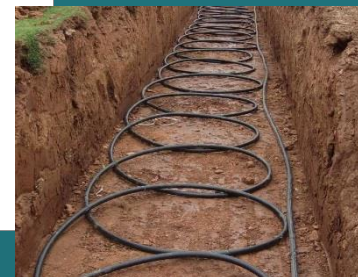
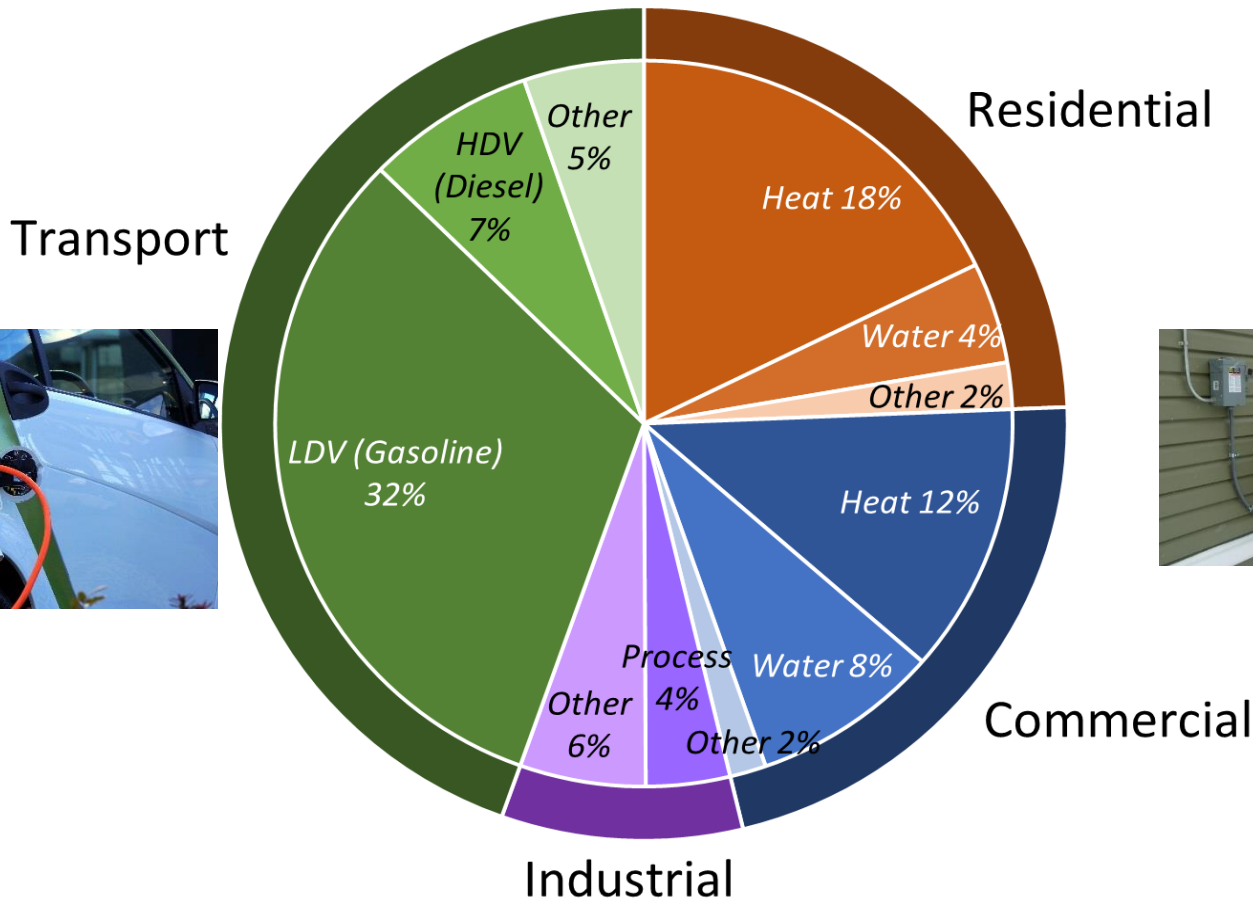


# Direct use of Fossil Fuels





# Advanced Electrification technologies



# Requires massive market transformations



- Assumed Market shares in 2035 according to NEEP's "Plausibly Optimistic" scenario reflects;
  - **Residential Heat Pumps-**
    - 89% for delivered fuel systems
    - 68% sales share of today's natural gas systems sales
  - **Cars and Light trucks-**
    - 70% of Sales

# Similar conclusions



**Electrification of buildings and industry in the United States**  
Drivers, barriers, prospects, and policy approaches

**Electrification Futures Study: End-Use Electric Technology Cost and Performance Projections through 2050**

**SP2** U.S. NATIONAL ENERGY POLICY CENTER

**OF THE U.S. NATIONAL ENERGY POLICY CENTER**

**New Efficiency: New York**  
A milestone energy efficiency target and comprehensive strategy — New York State's ambitious approach

**Energy Analysis and Policy**  
Lawrence Berkeley National Laboratory

**AMERICA'S CLEAN ENERGY FRONTIER: THE PATHWAY TO A SAFER CLIMATE FUTURE**

**EnergyVision**

**2025 STATEWIDE ENERGY EFFICIENCY TARGET**

**185 TBtu** end-use savings in buildings and industrial facilities below the 2025 energy-use forecast

equivalent to heating and powering more than 1.8 million

**nationalgrid**

**Northeast 80x50 Pathway**

**THE ECONOMICS OF ELECTRIFYING BUILDINGS**

HOW ELECTRIC SPACE AND WATER HEATING SUPPORTS DECARBONIZATION OF RESIDENTIAL BUILDINGS

**Green Energy, Efficiency and Electrification National Grid's Northeast 80x50 Pathway**

**EXECUTIVE SUMMARY**  
Climate change threatens our quality of life and the stability of planet earth. To reduce the risk that global temperatures will rise to dangerous levels, we must take action now. The Northeast 80x50 Pathway is a comprehensive plan to reduce greenhouse gas emissions, improve energy efficiency, and accelerate the adoption of clean energy technologies. This report provides a detailed analysis of the pathway's components and the benefits it will bring to the region.

**Ceres** Sustainability in the bottom line.

**MJB & A**

**Accelerating Investment in Electric Vehicle Charging Infrastructure**

Estimated Needs in Selected Utility Service Territories in Seven States

**RAP**

**Beneficial Electrification**

Ensuring Electrification in the Public Interest

By David Farnsworth, Jessica Shipley, Jim Lantz, and Nancy Seidman

**Action Plan to Accelerate Strategic Electrification in the Northeast**

**ZEV** 2018-2021

**MULTI-STATE ZEV ACTION PLAN**

ACCELERATING THE ADOPTION OF ZERO EMISSION VEHICLES

March 2018 Connecticut



# 2019 ASHP Initiative...Positioning for Growth!



- Scale of challenge
- Growing interest in ASHPs across the U.S. & Canada as a pathway to Decarb/EE/grid services
- Opportunity for Initiative to influence shape of the wave



# Can it be done? Yes!

- NEEP's Design Lights Consortium established Qualified Products List for Commercial SSL products in 2008
- List helped define **efficiency** and **quality** in the market
- 10 years later, Commercial Lighting Market quickly becoming dominated by SSL technology



# The Initiative going forward



# Thank you for the feedback

- NEEP provided proposal for Initiative changes in September
- Feedback led to many changes to final structure/scope





# Initiative Goals/Intended Impact

- Accelerated **adoption** of ASHP/VRF systems
- Broader implementation of regional **market strategies** (described in 2016 Market Transformation Strategy Report, forthcoming VRF Strategy Report)
- Broader use of NEEP's ccASHP Specification/Product **List**
- Broader use of NEEP's ASHP/VRF **Resources**
- Growth in **availability** of ccASHP products

# 2019 ASHP Initiative— The work

## ASHP

- Stakeholder engagement/technical assistance
- Performance Specification
- Installation Best Practices
- Consumer Education
- Smart Controls
- Research

## VRF


- Stakeholder engagement/technical assistance
- Market Transformation Strategy Development
- Explore Performance Specification

# New ccASHP Product List Website/Portal



Manufacturer	Brand (if applicable)	AHRI Certificate No.	Outdoor Unit Model	Indoor Unit Model(s)	HSPF (Region 10)	SEER	SEER (9°F)	ENERGY STAR Certific.	Ductless or Ducted	# Ductless Multi-zone or Single-zone	Minimum Capacity 47°F	Rated Capacity 47°F	Maximum Capa. 47°F
Daikin		3208521	RXG09HVAJ	FTXG09HVAJ	11	26.1	15.6	Yes	Ductless	Single-zone	4,666	12,000	18,670
Daikin		3208522	RXG10HVAJ	FTXG10HVAJ	10.55	24.2	14	Yes	Ductless	Single-zone	4,666	16,000	19,130
Daikin		3208523	RXG15HVAJ	FTXG15HVAJ	10	21	12.9	Yes	Ductless	Single-zone	4,666	18,000	21,280
Mitsubishi		4217888	MLUC-FE19NA	MSC-FE19NA	10.3	20.2	14.2	Yes	Ductless	Single-zone	7,500	21,000	29,700
Mitsubishi		4902119	MLUC-FE20NA	MSC-FE20NA	10	26	15.5	Yes	Ductless	Single-zone	3,000	10,900	18,000
Mitsubishi		4934170	MLUC-FE19NA	MSC-FE19NA	10.5	23	12.9	Yes	Ductless	Single-zone	3,000	13,600	20,000
Fujitsu		5083325	AOU9RLS2	ASU9RLS2	12.5	27.2	16.1	Yes	Ductless	Single-zone	3,100	12,000	16,000
Fujitsu		5083326	AOU12RLS2	ASU12RLS2	12	25	13.8	Yes	Ductless	Single-zone	3,100	16,000	21,400
Daikin		5262753	RX359HVAJ	FTX359HVAJ	12.5	24.5	15.3	Yes	Ductless	Single-zone	4,400	12,000	18,000
Daikin		5262755	RX315HVAJ	FTX315HVAJ	12.5	23	12.8	Yes	Ductless	Single-zone	4,800	12,000	18,000
Daikin		5262756	RX315LVAJ	FTX315LVAJ	11.8	20.6	14.4	Yes	Ductless	Single-zone	5,800	12,000	18,000
Daikin		5262757	RX315HVAJ	FTX315HVAJ	11	20.3	12.7	Yes	Ductless	Single-zone	5,800	12,000	18,000
Daikin		5262758	RX324HVAJ	FTX324HVAJ	10.6	20	12.5	Yes	Ductless	Single-zone	7,800	12,000	18,000
Hosana Global	Maytag	5587453	PSH4B0304K	BSVMA0304K-B	10	19	13.9	Yes	Ducted	N/A	10,200	24,000	32,000
Hosana Global	Maytag	5587457	PSH4B0309K	BSVMA0309K-B	10	19	12.9	Yes	Ducted	N/A	18,500	24,000	32,000
Fujitsu		5751311	AOU9RLFC	AUJ9RLFC	13	24	14.5	Yes	Ductless	Single-zone	3,100	12,000	16,000
Fujitsu		5751312	AOU9RLFC	AUJ9RLFC	12.2	21.5	14.5	Yes	Ductless	Single-zone	3,100	12,000	16,000
Fujitsu		5751313	AOU12RLFC	AUJ12RLFC	12.2	21.9	12.8	Yes	Ductless	Single-zone	3,100	16,000	19,400
Fujitsu		5751314	AOU12RLFC	AUJ12RLFC	11.5	20	12.8	Yes	Ductless	Single-zone	3,100	16,000	19,400
L.G.		5869819	LUX187HV	LCH187HV	10.1	20	15	Yes	Ductless	Single-zone	19,300	20,000	22,000
L.G.		6026101	L30A085V3	L30A085V3	10.2	20	12.5	Yes	Ductless	Single-zone	3,070	27,600	36,900
American Standard		6749789	4AVV0004A1	AMBCC080VZ1	10	19.25	13.75	Yes	Ducted	N/A	7,800	20,200	21,900
American Standard		6749791	4AVV0006A1	AMBCC080VZ1	10	19.25	12.5	Yes	Ducted	N/A	11,800	42,500	42,600
Trane		6749942	4TWW0004A1	AMBCC080VZ1	10	19.25	13.75	Yes	Ducted	N/A	7,800	20,200	21,900
Trane		6749944	4TWW0006A1	AMBCC080VZ1	10	19.25	12.5	Yes	Ducted	N/A	11,800	42,500	42,600
American Standard		6750022	4AVV0006A1	AMBCC080VZ1	10	18	13	Yes	Ducted	N/A	8,200	32,200	32,200
American Standard		6750033	4AVV0006A1	AMBCC080VZ1	10	18	12.5	Yes	Ducted	N/A	11,800	41,000	43,000





**Amana AVZC20**  
Amana  
AHRI Cert #: 10324704 | AHRI Type: HRCU-A-CB-0  
⚡ 23,400 Btu

**Efficiency Specs**

EER 13.00

Energy Star true

...

Duct Type Centrally Ducted

**Model Numbers**

Indoor/Outdoor	Model #
Outdoor	AVZC200241A*
Indoor	CA*F3642*6D**MBVC1200**1A**TX

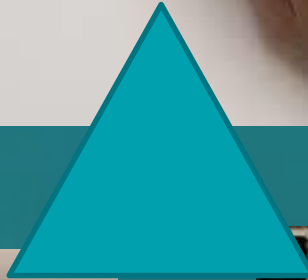
**Performance Specs**

Outdoor Dry Bulb	Indoor Dry Bulb	Unit	Min	Rated	Max
47°F	70°F	Btu/h	5,507	23,600	23,600
		kW	0.33	1.87	1.87
		COP	4.92	3.70	3.70
17°F	70°F	Btu/h	3,943	13,915	15,200
		kW	0.34	1.49	1.82
		COP	3.42	2.74	2.45
5°F	70°F	Btu/h	1,650	-	11,400
		kW	0.30	-	1.60
		COP	1.63	-	2.09

**Pan Heater**

Type	None
Type	None

# Focus on Integrated Controls



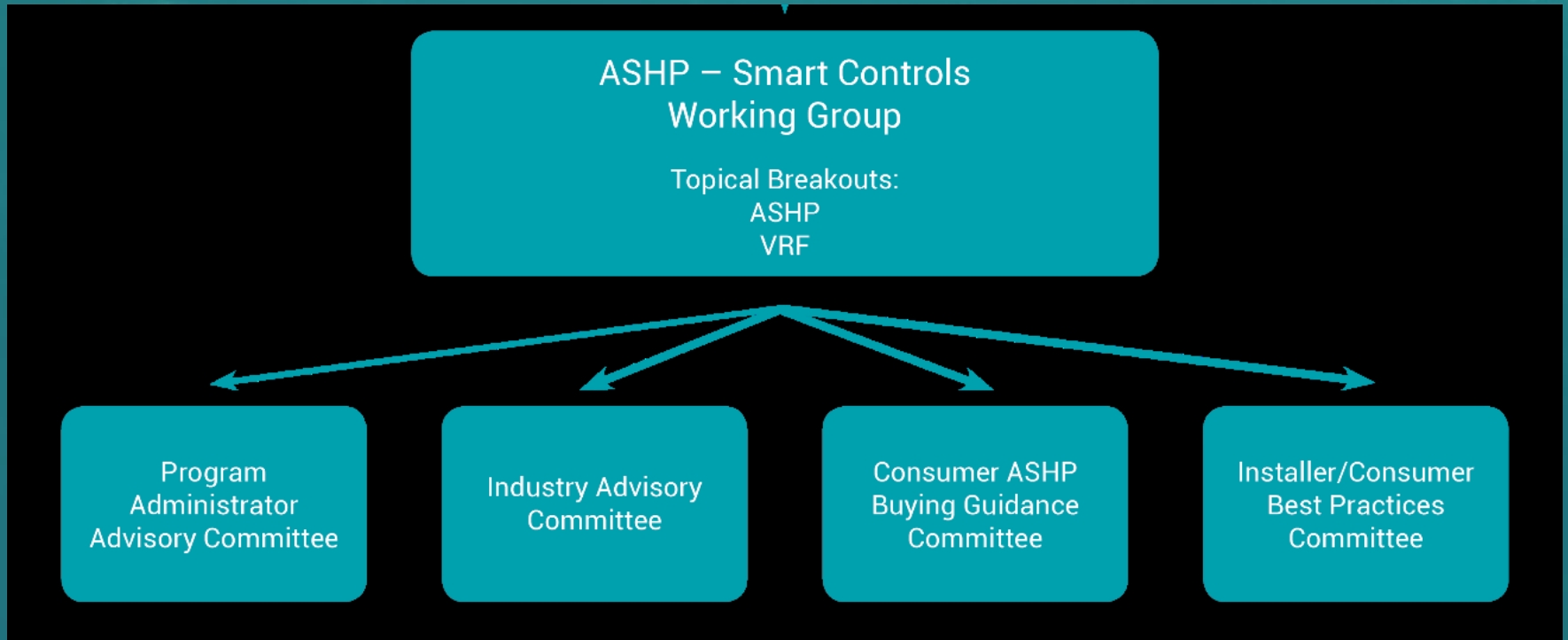
# Initiative expanding to include VRF

- Meeting in NYC on the 19<sup>th</sup> to inform regional strategy report
- Complete Report by April





# Stakeholder engagement Structure



# Expanding Partnerships

- Working increasingly with partners outside the region who are also working to drive adoption of high performing ASHPs....NEEA, MEEA, NRCan, California Utilities, etc.
- Exploring partnerships across broader renewable heating and cooling market



# Need for evolved funding structure

Guided by the need for diversity, equity, sustainability and impact

- Initiative Subscription
- ccASHP Product Listing Fees
- Event registration/sponsorship
- Federal Grants
- Foundation Grants

# Subscription Benefits

- “Unfettered” Access to ccASHP Product List
- Participation in NEEP’s ASHP/VRF Working Groups
- Participation in a number of sub-committees
- Opportunity to contribute to the development of NEEP resources/tools
- Technical assistance
- Visibility

# Initiative Subscription Costs



**TABLE B: 2019 NEEP ASHP & Smart Controls Annual Subscription Fees**  
(Required by 4/1/2019)

1. State Partnership Subscription (same as 2019 State Partnership pricing)	Population < 3 million	Population 3-10 Million	Population > 10 million
	<b>\$25,000</b>	<b>\$35,000</b>	<b>\$50,000</b>
2. Utility/Government Program Subscription (i.e., utilities/programs not part of a state partnership)	Program Budget <\$10M	Program Budget \$10M-\$100M	Program Budget >\$100M
	<b>\$5,000</b>	<b>\$10,000</b>	<b>\$20,000</b>
3. Industry Subscription (i.e., manufacturers, service providers, consultants, non-profit organizations, trade associations)	Non-profit, Small Business (<20 employees)	Standard Industry	
	<b>\$2,500</b>	<b>\$5,000</b>	
4. Individual ASHP installer/Municipal Employee/ Community-Based Organization Subscription/Grant Providers <sup>Note 1</sup>	<b>No Cost</b>		

# Next steps to become a subscriber

- Go to NEEP's website
  - <https://neep.org/initiatives/high-efficiency-products/emerging-technologies/ashp/subscription>
- Complete Subscription Form linked at top or bottom of Subscription page
- Subscribers receive 25% discount toward NEEP's Allies Program



# Product Listing Fees

- Manufacturers will be required to submit a listing fee for the review, approval and listing of products
- Fee based on total # of listed products, not a per/unit fee)
- Program will launch in Feb-March 2019, aligned with our new website/interface



# Product Listing Fee Costs



**TABLE A: 2019 ccASHP Annual Product Listing Fee Schedule**

**\$5,000** – For Manufacturers listing 1-10 products on the NEEP List in the calendar year

**\$7,500** – For Manufacturers listing 11-50 products on the NEEP List in the calendar year

**\$10,000** – For Manufacturers listing more than 50 products on the NEEP list in the calendar year

*\*Manufacturers who provide any level of listing fees are provided a \$2,000 credit to use towards any other NEEP fees including Initiative subscription, Allies program, or event sponsorship\**

## For more information

- Register for February 27 webinar for details

# Hands in!





Please type your questions into the sidebar

# THANK YOU FOR JOINING TODAY'S MEETING!



- Slides/Recording will be circulated tomorrow
- Go to NEEP website to Subscribe!
  - <https://neep.org/initiatives/high-efficiency-products/emerging-technologies/ashp/subscription>
- Manufacturers register for our February Webinar on the details of the new product listing process
  - <https://neep.org/events/tutorial-listing-your-products-neeps-new-product-list>
- Register for April 17 Webinar; NEEP's new Product List
  - <https://neep.org/events/introducing-neeps-new-product-list-and-subscription>
- Announcement coming soon about our annual Workshop
- Please follow up with Dave Lis and/or Claire Miziolek with any further questions or comments.
  - [djlis@neep.org](mailto:djlis@neep.org) , 781-860-9177 x127
  - [cmiziolek@neep.org](mailto:cmiziolek@neep.org), 781-860-9177 x115



# 2019 NEEP Summit: an exciting event coming up!



A  day event over the summer



A partnership with other organizations to bring more stakeholders to the table and have a strong regional conversation on decarbonization



**THANK YOU!**

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