EXPANDING HEAT PUMP ADOPTION:
A LOOK AT EVOLVING STATE AND LOCAL ACTIVITIES

NEEP Regional ccASHP Market Transformation Workshop
JUNE 27, 2017
Pathways to a renewable thermal transformation
States and cities are exploring (non-mutually-exclusive) long-term strategies for decarbonizing the thermal sector

» **Strategic electrification of heating and cooling**
  › Electrify the heating sector by scaling up heat pumps and solar heating/cooling
  › Explore potential to modify retail rates for electric heating
  › Increase load/sales for utilities and/or enable fuel switching
  › Synergize with the transportation sector

» **District heating and cooling networks**
  › Invest in CHP and especially bioenergy-based CHP systems
  › Build out low temperature heating networks with GSHPs or solar thermal and potentially integrate with electric networks to optimize production
  › Assess business and financing models – as well as regulatory requirements – for widespread deployment of district heating and cooling networks

» **Centralized/decentralized bioenergy-based heating networks**
  › Focus on biofuel, biogas, or biomass heating systems, especially in rural or agricultural areas.
  › Large-scale biogas may be injected directly into natural gas pipelines
  › Biofuels integrated into traditional heating oil blends
  › Biomass pellet and chip heating systems can be deployed to displace heating oil or propane
Evolution of heat pump policies and programs
Heat pumps are emerging from efficiency programs to become core components of state emission reduction goals

Utility Efficiency Programs
- Rebates and financing
- Emphasis on cooling efficiency/load reduction

Expanding Policy and Program Support
- Expanded incentives (emphasizing heating benefits)
- RPS integration
- Soft cost reduction and supply chain development
- Community purchasing campaigns
- Exploration of innovative financing models

Adapting best practices and successful policies/programs from the renewable electricity sector

(But of course, it’s not always that simple...)
Growing strategic interest across region
Cities and states (and utilities) are seeing a crucial role for heat pumps in meeting deep decarbonization goals

State strategies and planning
States across the Northeast have released renewable thermal strategies and/or are incorporating heat pumps into their energy plans.

2014: Commonwealth Accelerated Renewable Thermal Strategy
2015: ME Comprehensive Energy Plan Update
2016: VT Comprehensive Energy Plan
2017: NYSERDA RH&C Policy Framework
2017: Feasibility Studies of RT Technologies in Connecticut
2017: RI Renewable Thermal Market Dev Strategy

States:
- NY
- MA
- CT
- RI
- NH
- VT
- ME
Growing strategic interest across region
Cities seek to develop policies and programs that complement state programs

City strategies and planning
While cities have ambitious GHG reduction goals, cities are beginning to identify electrification of heating as a promising pathway to 80% by 2050 goals.

2015: Cambridge, MA – Net Zero Energy Action Plan
2016: NYC – Roadmap to 80 x 50
2017: NYC & Burlington (w/ Washington D.C. & Boulder) – local market analysis and heat pump strategic planning process
2017-18: Boston, Northampton, Portland, Providence, Somerville – local market analysis and community campaigns
What are the barriers to RH&C in the Northeast?

**Policy & Regulatory Barriers**
- Fuel switching regulations
- Fossil fuel subsidies
- Lack of economy-wide carbon pricing

**Technical & Building Barriers**
- Low refurbishment rates
- Inadequate performance data

**Economic Barriers**
- High installed costs
- Inadequate financing and ROI
- Capital constraints

**Awareness Barriers**
- Lack of consumer awareness
- Policy & consumer awareness of thermal energy impacts

**Decision-Making Barriers**
- Ownership priorities
- Split incentives
- Lack of confidence in technology

**Supply Chain Barriers**
- Insufficient contractor base
- Staff training for O&M
- Supply chain inefficiencies

For a more detailed look at market barriers, consult the 2016 update of the NEEP ASHP Market Strategies report or any of the state renewable heating & cooling policy reports (MA, RI, NY, CT)
Policy and program approaches across stakeholder groups
States seek to drive market development and cities are exploring local actions that complement state/utility actions

### State Policies & Programs

**Mandates & Regulations**
- Utility mandates
- Building codes

**Incentives & Financing**
- Expanded rebates
- Low-cost financing and innovative business models

**Workforce Development**
- Contractor engagement and supply chain development

**Marketing & Outreach**
- Raise awareness among vendors, installers, and consumers

**QA/QC**
- Establish standards and best practices
- Verify system performance

**Cost Reductions**
- Reduce hard and soft costs of heat pumps

### City Policies & Programs

**Mandates & Regulations**
- Permitting, building codes, other local regulations

**Incentives & Financing**
- Providing access to LMI populations

**Workforce Development**
- Local economic development programs
- Local market analyses

**Marketing & Outreach**
- Outreach and purchasing campaigns

**QA/QC**
- Qualification of contractors for city programs
- City inspection
Case Study #1:
NYSERDA RH&C Policy Framework & Cost Reductions Study (NY)

» Comprehensive market segmentation study to evaluate RH&C potential across 2000+ market segments

<table>
<thead>
<tr>
<th>Scenario</th>
<th>% of cost-effective thermal load that could be met by ASHP &amp; GSHP</th>
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<tbody>
<tr>
<td>2017</td>
<td></td>
</tr>
<tr>
<td>no cost reductions</td>
<td>4%</td>
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<tr>
<td>2021</td>
<td></td>
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<tr>
<td>w/ cost reduction interventions</td>
<td>8%</td>
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<tr>
<td>w/ cost reduction interventions + carbon/grid value incentives</td>
<td>12%</td>
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<td>26%</td>
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» Focus on policies and programs that can encourage cost reductions to unlock technical potential

› Developed through engagement of industry stakeholders

Released Feb. 2017
Case Study #1: NYSERDA RH&C Policy Framework & Cost Reductions Study (NY) (cont.)

» Cost reduction opportunities

› Implement community procurement programs
› Integrate RH&C into existing trade channels
› Develop customer targeting and engagement tool
› Provide technical/engineering assistance and project development support
› Pilot third-party ownership and other innovative business models
› Expand access to cheaper financing options
› Facilitate standardized equipment and design approaches
› Develop unified, streamlined permitting process for RH&C

Released Feb. 2017
Case Study #2:
National Grid Delivered Fuels to Energy Project (NY)

- National Grid exploring opportunities to deploy ASHP in Niagara-Mohawk electric territory
  - Targeting electric customers in upstate NY
  - Exploring under the REV initiative
- Conducted utility BCA for converting delivered fuel customers to ASHP
- Exploring outreach and education programs to drive deployment

Spring 2017
Case Study #3: Oil Heat Dealer Workforce Development (RI)

In 2016, RI OER worked with OHI to convene delivered fuel dealers to develop an action plan to support fuel dealers in participating in RT and energy efficiency markets:

- Engaged 26 RI delivered fuel companies + broader stakeholders
- Identified actions that could facilitate fuel dealer expansion into heat pump and efficiency markets

OER and OHI, with support from Real Jobs Rhode Island, are broadening engagement to identify training needs to enable fuel dealers to become whole-home energy providers.

(ongoing)
Case Study #4: CNCA New England Cities project

» Carbon Neutral Cities Alliance-supported project with Boston, Northampton, Portland, Providence, and Somerville

» Part 1: Local market analyses
   › Completed market segmentation analysis of 1-4 family residential buildings in all 5 cities
   › Conducted customer insights analysis of high-potential customers in each city

(ongoing: Sep 2016-Mar 2018)
Case Study #4: CNCA New England Cities project (cont.)

(ongoing: Sep 2016-Mar 2018)
Case Study #4: CNCA New England Cities project (cont.)

» **Part 2:** Community group purchasing and outreach campaigns

» Each city approaching local market in different ways

  › Casco Bay Heat Pump Challenge
  › HeatSmart/CoolSmart Somerville
  › HeatSmart Northampton
  › Renew Boston Heat Pump Program (TBD)
  › Providence Energy Fair

(ongoing: Sep 2016-Mar 2018)
Evolution of heat pump policies and programs
Where do we go next?

Utility Energy Efficiency Programs
• Rebates and financing
• Emphasis on cooling efficiency/load reduction

Expanding Policy and Program Support
• Expanded incentives
• RPS integration
• Soft cost reduction and supply chain development
• Community purchasing campaigns
• Exploration of innovative financing models
Thank you!

Any questions?

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