



Air Source Heat Pump Policy Considerations

Funding Mechanisms, Equity and Workforce Development

Regional ASHP Market trends

- Twenty programs utilize the NEEP cold climate air source heat pump specification
- Sales increased from 50,000 units in 2013 to approximately 75,000 in 2016; a 50 percent increase in just three years!

Residential and commercial buildings consume 39 percent of the country's total energy.¹ Of this energy, 62 percent is used for space and water heating and cooling in residential homes.² As states continue to strengthen their carbon emission goals, it becomes increasingly important to electrify the heating sector with air and ground source heat pumps and other renewable thermal technologies. NEEP has made it a goal for 40 percent of Northeast homes and buildings to use high performance heat pumps for space and water heating by 2030. Air source heat pumps (ASHPs) are a growing segment of the country's HVAC

market. There are numerous policy initiatives that policy makers should consider to promote the rapid and equitable growth of the heat pump market. This exemplar focuses on three of them: innovative funding mechanisms, equitable policies targeted at low and moderate income (LMI) customers, and workforce development.

Funding Mechanisms

Program administrators are well set up to deliver heat pump incentives through the established energy efficiency program model. While ratepayer funded heat pump programs are common, they are not the only funding mechanism that can be used. In some cases, existing policy or cost effectiveness mandates can restrict the usage of ratepayer funding for fuel switching electric measures such as ASHPs because the funds are meant to reduce electric consumption. One solution is for policy makers to expand energy efficiency programs to encompass electrification such as [H.4857 An Act to Advance Clean Energy](#) in Massachusetts. The Acadia Center identified Massachusetts, Vermont, and New Hampshire as having Thermal Portfolio

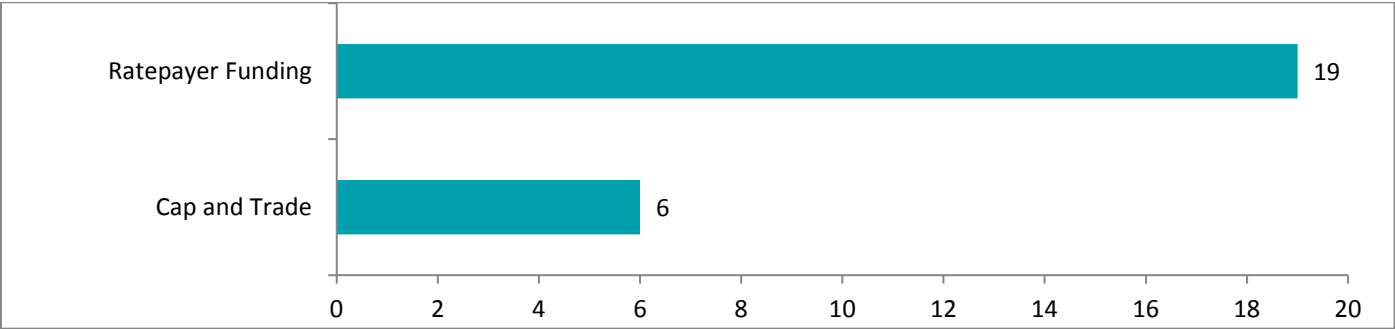
National Funding Mechanisms:

- Ratepayer Funding (systems benefits charge)
- Cap-and-Trade Programs
- Forward Capacity Markets
- State Budgets
- Shareholder Funding
- Tax Credits
- Alternative Portfolio Standards

¹ <https://www.eia.gov/tools/faqs/faq.php?id=86&t=1>. Total energy consumption includes both end-use energy and electrical system energy losses associated with generation, transmission, and distribution. Buildings account for 28% of end-use consumption.

² <https://www.eia.gov/todayinenergy/detail.php?id=37433>.


Standards that require utilities to invest in thermal resources.³ The alternative is to look for different funding sources.



The American Council for an Energy-Efficient Economy (ACEEE) reviewed 23 ASHP programs and found that 19 were funded in part with ratepayer funding, six with cap-and-trade, and others used forward capacity markets, state budgets, and shareholder funding.⁴ NEEP identified tax credits and Alternative Portfolio Standards as other options. States that are in or have just joined a cap-and-trade program, such as New Jersey, could use this new funding stream to transition customers away from oil and propane in a way that might not be possible with current cost-effectiveness and fuel-switching policies.


Targeted Equitable Policies

NORTHEAST AND MID-ATLANTIC REGIONAL GOAL




40%
of households in the region
use ASHPs as primary space
heating system by 2030

=



50B
lbs. of CO2e emissions and
\$4 Billion in operating cost
saved annually

=



6.5 COAL POWER PLANTS

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Low-income multifamily buildings offer an opportunity to increase awareness and credibility of heat pump systems. However, financial barriers can prevent low-income customers from making these important upgrades and realizing the energy, environmental, economic, and health benefits that they provide. If left out, these disadvantaged customers could fall farther behind due to shifting natural gas and fossil fuel prices. If wealthy households switch to high efficiency electric heating systems, the shrinking gas customer base could inflate the cost of gas, trapping LMI customers in an unfair system of larger utility bills and less healthy homes. Innovative ASHP programs can set targets for LMI upgrades whether through a number of installations, increased incentives, fund allocation, or LMI energy savings goal setting.

³ <https://acadiacenter.org/wp-content/uploads/2020/03/Acadia-Center-Clean-Heating-Pathways.pdf>
⁴ https://www.aceee.org/sites/default/files/pdfs/programs_to_electrify_space_heating_brief_final_6-23-20.pdf



Workforce Development

ASHP programs should also consider workforce development and job creation. There is a growing need for skilled clean energy workers to support the clean energy economy and to supplement the dwindling HVAC workforce. Ramped-up ASHP programs will need knowledgeable designers, installers, and building operators. Workforce development programs can reduce costs for HVAC companies to hire and train new employees⁵ and can shift the market to renewable thermal technologies by increasing the number of knowledgeable professionals, reducing installation time and costs, and creating more competition.⁶ Workforce development programs can operate at many levels, from encouraging clean energy career paths and improving training/education facilities to transitioning the fossil fuel workforce over to clean energy. Workforce development policies can increase equity by targeting underserved low-income communities and fossil fuel communities such as coal towns.

Case Studies: ASHP Policy and Programs

California

- **Policy:** [SB1477](#) [unlinked](#) cap and trade funds for “low-emission buildings and sources of heat energy.” The revised “three-prong test” opened the doors for fuel switching and ratepayer funding
- **Program Names:** Technology and Equipment for Clean Heating (TECH) and Building Initiative for Low Emission Development (BUILD)
- **Funding Model:** Ratepayer funding and cap-and-trade
- **LMI incentives:** 30% of the \$200 million budget must be reserved for low-income projects

California is developing two state-wide programs made possible by policy. California bill SB1477 directs funds to low-emission buildings and sources of heat energy, makes use of funds from the California Air and Resource Board’s Cap-and-Trade program, and emphasizes low-income development. Alongside this, the California Public Utility Commission enabled program administrators to more readily include fuel-switching measures in their ratepayer programs by revising a cost-effectiveness test known as the “three-prong test”.

Technology and Equipment for Clean Heating (TECH) will use upstream incentives to develop heat pump and low-emission space heating and cooling markets. Building Initiative for Low Emission Development (BUILD) will incentivize a wide range of measures including heat pumps and energy efficiency in new low-emission homes. Seventy five percent of BUILD’s budget is reserved for low-income projects with another 12 percent allotted to technical assistance for low-income developers.⁷ Impressively, SB 1477 requires that new low-income residential housing projects must be offered technical assistance and ensure that *efforts to electrify not result in higher utility bills for the occupants*. TECH and BUILD will both be financed with ratepayer funding as well as

⁵https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjAhJrgiINDrAhUIZjUKHQXmADYQFjAAegQIARAB&url=https%3A%2F%2Fwww.nyserda.ny.gov%2F-%2Fmedia%2FFiles%2FAbout%2FClean-Energy-Fund%2FCEF-Workforce-Development-and-Training.pdf&usq=AOvVaw0nubg-_Ai5dGzsd9M024KH

⁶ <https://acadiacenter.org/wp-content/uploads/2020/03/Acadia-Center-Clean-Heating-Pathways.pdf>

⁷ <https://efiling.energy.ca.gov/getdocument.aspx?tn=234014>



proceeds generated from GHG emission allowances from the cap-and-trade program. To comply with the California Air Regulatory Board rules for these funds, spending must be proportionally directed to gas corporation service territories from where the funds are derived.⁸

New York

- **Policy:** “[Climate Leadership and Community Protection Act](#)” set more aggressive energy efficiency goals and established a fuel-neutral target along with carve outs for LMI spending and heat pump adoption
- **Program Name:** NYS Clean Heat: Statewide Heat Pump Program
- **Funding Mechanism:** Ratepayer funding
- **LMI incentives:** \$38 million from the Clean Energy Fund Dedicated to making electrification solutions available¹
- **Workforce development:** \$38.2 million from the Clean Energy Fund to train and develop needed clean heating and building electrification workforce

In 2019 Governor Cuomo released [New Efficiency: New York](#) (NE:NY), a white paper that laid out a more aggressive energy efficiency strategy, including establishing an overarching fuel-neutral target and carve outs for LMI customers and heat pump adoption. The ambitious goals outlined in NE:NY were codified by the signing of the Climate Leadership and Community Protection Act, SB 6599, and included a requirement that 35 percent of benefits must go to underserved communities. In 2020, New York initiated a statewide heat pump framework to support the transition to renewable space and water heating with incentives offered through the NYS Clean Heat Program run by state utilities. Thanks to the fuel-neutral Btu target, all customers – regardless of existing heating systems – are eligible for incentives under the program. The program supports installation of ground source heat pumps and cold climate ASHPs.

Along with the nearly \$500 million invested through the NYS Clean Heat incentive program, NYSEDA will invest approximately \$230 million in market development initiatives from the Clean Energy Fund. Thirty-eight million dollars will be used to address institutional barriers and technical challenges to make strategic electrification upgrades more available to LMI consumers. Another \$38 million will be used to develop the clean energy workforce. New York is developing a talent pipeline that includes expanding training infrastructure, offering internships and on-the-job training, and incentives for companies hiring heat pump workers.⁹ The state has set a goal to train 14,000 workers across the heat pump supply chain to grow the clean energy workforce and address the shortage of qualified labor.¹⁰

⁸ https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1477

⁹ https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjAhJrgiNDRAhUIZjUKHQXmADYQFjAAegQIARAB&url=https%3A%2F%2Fwww.nyserda.ny.gov%2F-%2Fmedia%2FFiles%2FAbout%2FClean-Energy-Fund%2FCEF-Workforce-Development-and-Training.pdf&usg=AOvVaw0nubg-_Ai5dGzsd9M024KH

¹⁰ <https://www.nyserda.ny.gov/-/media/Files/About/Clean-Energy-Fund/cef-renewable-heating-and-cooling-chapter.pdf>

Maine

- **Policy Name:** [“An Act To Transform Maine's Heat Pump Market To Advance Economic Security and Climate Objectives”](#) establishes a 100,000 heat pump target by 2025 and allows for the use of forward capacity market funds
- **Program Name:** Efficiency Maine Heat Pump Program
- **Funding mechanism:** Ratepayer funding, ISO Forward Capacity Market, cap-and-trade (RGGI)
- **LMI Incentives:** Enhanced rebate of \$2,000 (regular rebate is up to \$1,500) per single zone units in non-natural gas homes.

Massachusetts

- **Policy:** [“An Act to Advance Clean Energy”](#) expands qualifying technologies and measures eligible for inclusion in utility ratepayer funded efficiency programs, including strategic electrification that results in cost-effective GHG reductions.
- **Program Name:** Mass Save Fuel Optimization Rebates
- **Funding Mechanism:** Ratepayer funding, ISO Forward Capacity Market, cap-and-trade (RGGI)
- **LMI Incentives:** Enhanced rebates for LMI customers.
- **Workforce Development:** Mass Save provides heat pump and integrated control training opportunities. Installers are taught system design and how to educate customers.