NEEP 2022 Quarterly Report
Quarter Four

Building Energy Codes and Appliance Standards

The NEEP region continues to lead the way with adoptions of the 2021 IECC. New Jersey and Connecticut both adopted the code, and several other states are proceeding with adoption, including Massachusetts, Vermont, Maine, Rhode Island, Delaware, Maryland, and the District of Columbia. West Virginia and New Hampshire adopted the 2018 IECC in 2022 and both went into effect that year. New York will skip the 2021 IECC in favor of adopting the 2024 IECC when it becomes available.

NEEP provides technical expertise by serving on the International Code Council (ICC) 2024 IECC commercial consensus committee and building modeling subcommittee to review proposals for inclusion in the 2024 IECC, which will be published in 2023. The first drafts of the 2024 commercial and residential codes were published in fall 2022. NEEP assists interested parties in understanding the new and updated code provisions through a number of resources, including launch of a 2024 IECC webpage, development of one-pagers on the residential and commercial code changes, and convening a Regional Stakeholder Meeting on November 30, 2022.

The State Appliance Standard Database (SASD) was updated to include all existing appliance standards categories for NEEP states, with a few exceptions that will be added in 2023 (i.e., equipment battery charging stations and pool pumps). These updates make SASD the most comprehensive appliance standards database worldwide. The database now includes all California efficiencies and below-California appliance standards. Massachusetts is fully utilizing SASD as of January 1, 2023, and others (D.C., R.I., N.Y., N.J., and Md.) will follow later this year. NEEP is working with partners Appliance Standard Awareness Project (ASAP) and the U.S. Environmental Protection Agency (US EPA) to develop a methodology to inform manufacturers about standards updates. Additionally, we will continue to build out the SASD toolbox. Late in 2022, the state of New York passed appliance standards legislation and will onboard to SASD in the first quarter of this year.

Convening regional and state code collaboratives remains an important part of NEEP's stakeholder engagement. These include the Maine Code Collaborative, the New Hampshire Code Collaborative, the Massachusetts Net Zero Building Coalition and Technical Subcommittee, and the Regional Codes Working Group. We are working with Massachusetts stakeholders throughout development of the stretch code and municipal opt-in specialized code and published resources to summarize the residential and commercial provisions. NEEP provided direct technical assistance on codes to all states in our region.

NEEP presented to the Maine International Energy Code Technical Advisory Group (TAG) on a proposal to include Passive House and DOE Zero Energy Ready Homes Programs as alternative compliance pathways to the state's adoption of the 2021 IECC. The proposal was approved by the TAG and will go to the full Maine Uniform Building and Energy Code (MUBEC) Technical Codes and Standards Board for a vote in 2023.

NEEP continues to work with the New Jersey Board of Public Utilities (NJ BPU) on the final draft of the state's Zero Energy Building Roadmap, and we intend to convene the code collaborative to discuss the plan in the first quarter of 2023. We also published a resource relating to stretch codes and affordable housing in New Jersey.

NEEP provides direct technical assistance to the state of Vermont as it continues its 2021 IECC adoption process. On October 28, 2022, the Secretary of State officially accepted the filings for the Residential Building Energy Standards (RBES) and the Commercial Building Energy Standards (CBES) and the state is targeting an effective date of fall/winter 2023. We also made public comments during the CBES public hearings held on December 2, 2022.

On October 6, 2022, NEEP hosted a webinar as part of the U.S. Department of Energy's (US DOE) summer seminar series of the 2022 National Energy Codes Conference. The topic was Less is More: Building to Zero Energy, Water, and Carbon, with speakers from the Town of Breckenridge, Colorado, Green Builder Coalition, and the International Living Future Institute.

In the final quarter of 2022, NEEP released resources related to Energy Codes and State Climate Plans, Utilities and Energy Code Compliance, and Claiming Energy Savings from Appliance Standards. In addition, we published three resources related to offsite construction, Residential Off-site Construction: Misconception Vs. Reality, Coordination of Fabrication and Building Site Inspections, and ICC/MBI 1205-2021 Standard for Off-site Construction: A New Tool for States and Local Jurisdictions. Lastly, we published a blog on Getting Started with Remote Virtual Inspections.

We distributed our newsletter, The Code Word, throughout 2022. We also updated and reposted the online ArcGIS codes tracker and updated both our appliance standards webpage and the main codes webpage.

Throughout 2022, NEEP supported New Castle County, Delaware toward adoption of a stretch code. A public webinar and kick-off of the public stakeholder process were held on October 27, 2022 in partnership with Green Building United, Energize Delaware, and Dee Durham, Councilmember from New Castle County. We will provide a proposal for the county in the first quarter of 2023.

In November 2022, NEEP met with Maryland Department of Labor Commissioner regarding builder-proposed code changes that would weaken the code. Upon the state's publication of the code in the state register, NEEP and our partners will respond in writing to the proposed changes and seek a meeting with the builders, the Department of Labor, and the Governor's Office to resolve any weakening provisions.

Progress Toward 2022 Outcomes	% Complete at Q4
1. Four additional Northeast and Mid-Atlantic states adopt electrification/zero energy stretch codes (DE, MA, NY, RI); Two additional Northeast and Mid-Atlantic states adopt stretch codes (CT, NJ) **Progress Toward Outcome:** NEEP is working with the state of Delaware on options for a stretch code and is assisting New Castle County, Delaware to design, adopt, and implement their own stretch code. We met with representatives from the Green Energy Consumers Alliance to discuss potential inclusions for a stretch code update for the state of Rhode Island, which is in the process of developing a bill for the legislature incorporating our ideas. We also look forward to working with New York as they begin the process of updating their stretch codes. We are in process of finalizing New Jersey's Zero Energy Buildings Roadmap, which among other initiatives would include a state-wide stretch code. Lastly, we are discussing developing Building Energy Performance Standards (BEPS) and an all-electric code in Maryland, with possible additional topics on energy codes in the future. NEEP continues to facilitate the Massachusetts Net Zero Building Coalition and Technical Subcommittee, and to meet with the Massachusetts Department of Energy Resources (MA DOER) to support their recent adoption of an updated stretch code and a municipal opt-in specialized code. The updated stretch code takes effect on January 1, 2023 for residential buildings and July 1, 2023 for commercial buildings for designated green communities, and the municipal opt-in specialized code is available for consideration and adoption on January 1, 2023.	70%
2. Municipalities in six states (CT, DE, MA, MD, NH, WV) adopt zero energy building codes **Progress Toward Outcome:** NEEP continues to work with New Castle County, Delaware, Montgomery County, Maryland, and to develop resources for the Massachusetts stretch and opt-in specialized codes for communities that will adopt the specialized code at town meetings in spring 2023.	50%

3. Three additional states (CT, NH, PA) adopt code and standards attribution requirements and improve code compliance through workforce development, specifically code official retention and training **Progress Toward Outcome:** NEEP is laying the groundwork and securing funding to conduct a code compliance study for Pennsylvania and Delaware. We created a new attribution resource for claiming savings from appliance standards and provide technical assistance to Efficiency Vermont toward development of attribution protocols.	35%
4. Five states (CT, MD, NY, PA, VT) adopt appliance standards, and four (MA, ME, NJ, RI) implement adopted standards **Progress Toward Outcome:** The State Appliance Standards Database (SASD) now includes existing United States appliance standards. Rhode Island, Maine, and New York all adopted appliance standards this year. Massachusetts is fully utilizing SASD as of January 1, 2023, and others (D.C., R.I., N.J., Md., and Maine) will follow in 2023. New York adopted standards legislation in the final quarter of 2022 and will onboard to SASD in the first quarter of 2023.	75%

Grid-Interactive Homes and Buildings

Grid-interactive homes and buildings (GIHBs) are a key complement to the region's decarbonization efforts, enabling broad building electrification as well as helping to manage intermittent renewable power supply. In the near term, these homes and buildings are serving to reduce the need for expensive grid/pipeline infrastructure investments and prevent expensive summer spikes on the grid.

Our work in the final quarter of 2022 continued the shifting focus from grid-interactive technology deployment to highlighting the underlying policies that will support a more compelling value proposition for broad customer participation in grid-interactive activities, especially for residential customers. NEEP began development of a brief to identify strategies to accelerate GIHBs/active demand-response programs with Inflation Reduction Act (IRA) and Bipartisan Infrastructure Law (BIL) funding; the brief will be released in the first quarter of 2023.

NEEP is also updating the regional tracker for GIHBs and tracking regulatory proceedings to advance policies that enable GIHBs in the Northeast region. In the fourth quarter of the year, the GIHBs team presented and submitted comments on the total system benefit metric (TSB) for the Connecticut Department of Energy and Environmental Protection's (CT DEEP) Comprehensive Energy Strategy (CES) proceedings.

Progress Toward 2022 Outcomes	% Complete at Q4
1. Three states consider adopting policies and regulations that identify grid-interactive homes and buildings as alternatives to investing in additional grid infrastructure build out (i.e., non-wires or non-pipes alternatives) **Progress Toward Outcome:** New York is rolling out a series of non-pipeline alternative projects throughout the state including NYSEG and Con Edison, many including grid-interactive buildings as a key solution. New Jersey is drafting a Grid Modernization study to support its Energy Master Plan. A key recommendation instructs utilities to propose and adopt non-wires solutions.	66%

2. Three states offer incentive programs for grid-interactive appliances and equipment (including storage) with special consideration for overcoming equity barriers **Progress Toward Outcome:** Connected Solutions Programs in Connecticut, Massachusetts, Rhode Island, and New Hampshire offer incentives for connected water heaters, electric vehicle (EV) chargers, and batteries.	100%
3. Three states launch grid-interactive homes and buildings demonstration projects **Progress Toward Outcome:** Three Connected Communities projects are set to launch in the region with DOE funding (N.Y., Maine/N.H., and Mass.).	100%

Heating Electrification Market Transformation

2022 represented an exciting year for heating electrification across the region with NEEP's initiative helping to leverage many localized efforts into a regional movement. NEEP's Heating Electrification initiative supported the market development of heat pumps in a number of impactful ways. Much of our work involved successfully facilitating collaborations across states, program advocates, and the heat pump industry to address priority market barriers through regionally coordinated activities.

The cold climate air source heat pump (ccASHP) product list continued to grow as a key market resource, with more than 300 daily visits, as an increasing number of consumers and installers use the list to effectively select systems appropriate for cold-climate applications. NEEP's new sizing tool is being leveraged to improve the sizing and selection of heat pumps by making performance data in the product list more actionable for installers. To effectively maximize performance of heat pumps, high performance systems must also be designed, sized, installed, and operated well. This new tool and other NEEP supporting resources contribute to this objective.

We are working closely with manufacturers to ensure a smooth transition to Version 4.0 of the ccASHP specification, which coincides with other shifts in the industry's testing and rating methods. NEEP designed this new version to provide continuity to the market during a time of change and uncertainty. It includes specifications for variable refrigerant flow (VRF) systems, appropriate for larger commercial applications.

NEEP led a number of collaborative research projects aimed at advancing knowledge related to heating electrification technologies in 2022. The research includes a US DOE-funded VRF in-field performance validation study, as well as another study co-funded across eight organizations exploring opportunities to improve heat pump test procedures. Both projects bring together organizations from across the region and country to advance these technologies. In both cases, the projects successfully collected in-field performance data for the cooling season and began collecting heating season performance data.

On the water heating front, NEEP co-launched the Northeast Heat Pump Water Heater (HPWH) Alliance, a collaborative effort to drive both near- and long-term adoption of HPWHs through enhanced program activities and designs. NEEP is partnering with the US EPA/ENERGY STAR, US DOE, ICF, D+R International, and others in bringing program administrators from around the region together to bring innovative enhancements to various markets. We are also developing new educational resources for weatherization auditors, with plans to roll these out in the first quarter of 2023.

NEEP hosted our ninth annual Heating Electrification Workshop on October 19-20, 2022. The workshop brought together regional stakeholders to engage and collaborate on key strategies to drive market transformation of the heating, ventilation, and air conditioning (HVAC) industry. The workshop drew over 300 attendees and once again provided a constructive platform for regional/national information sharing and collaboration.

Progress Toward 2022 Outcomes	% Complete at Q4
1. Five new programs use NEEP's ccASHP product list as a qualified products list (QPL) and product selection tool to help ensure high performance ASHPs are being selected by the market, and sized appropriately **Progress Toward Outcome:** PSEG, Jersey Central, Pacific Northwest National Laboratory (PNNL), Colorado Springs Utilities, and Upper Peninsula Power Company (UPPCO), were five new programs to leverage the ccASHP product list in 2022. Four utilized the resource as a qualified products list (QPL), while PNNL is building a public ASHP product selection tool that will leverage the sizing tool functionality of the product list.	100%
2. 30 percent increase in annual sales of residential-size ASHP systems across the NEEP region **Progress Toward Outcome:** The New York-New England region saw a 28% increase in sales of residential-size ASHP systems from 2020 to 2021.	90%
3. Regional heating electrification programs exceed their own 2022 goals for ASHP, VRF, GSHP and HPWH sales, with particular emphasis on surpassing their specific goals for LMI customers **Progress Toward Outcome:** NEEP is gathering data on program goals for these technologies to establish a baseline. We also support the successful implementation of these regional programs.	Gathering program data
4. Fifty regional stakeholders engage NEEP's new regional Advanced Water Heating working group to establish highest priority regional market transformation strategies **Progress Toward Outcome:** NEEP – in partnership with US EPA/ENERGY STAR, US DOE, ICF, and D+R International – convened a group of 45 regional program administrators to kick off the Northeast HPWH Alliance project. The project aims to assist regional programs in identifying and implementing enhancements to their HPWH program offerings.	90%

Public Policy and Programs

NEEP continued to track, analyze, and aid in the implementation of policies that pursue building electrification across the Northeast region. With the passage of the Inflation Reduction Act (IRA), we pivoted our work toward researching and analyzing programs and policies that would stem from both the IRA and the Bipartisan Infrastructure Law (BIL). Additionally, we produced blogs analyzing policy changes at the state and national levels, presented at conferences, and coordinated with stakeholders across the region.

NEEP tracked activity related to the IRA and BIL and created a Federal Funding Resources Center. The page includes a BIL Energy Efficiency Grants Tracker, an IRA Building Decarbonization Fact Sheet, and a guide on expanding energy efficiency programs under BIL and IRA funding. We also hosted two webinars on preparing for the implementation of the IRA – Building a Pathway for IRA Funding and Preparing for IRA Funding. In 2023, we plan to build on this work and use our network of state energy offices, allies/implementers, and advocates to advance IRA and BIL funding opportunities in the Northeast region.

NEEP published four blogs in the fourth quarter. One looked at the potential for the Northeast to grow energy efficiency and building decarbonization efforts under the IRA, Deploying the Inflation Reduction Act. Another looked at the findings and recommendations of the Massachusetts Commission on Clean Heat, Massachusetts Looks to Change How it Decarbonizes its Buildings. The third provided an analysis of data from the Regional Energy Efficiency Databased (REED) and highlighted regional trends, Regional Energy Data Dive. And the last focused on how incorporating new metrics into the benefit-costs analysis for the Weatherization Assistance Program (WAP), can enable more measures, New Metrics Can Allow to Decarbonize and Save Energy.

NEEP tracks regulatory proceedings and participates in state-run working groups to advance decarbonization policies throughout the region. In the fourth quarter of 2022, we presented to Connecticut DEEP for the state's Comprehensive Energy Strategy (CES) proceedings on the total systems benefit metric (TSB) and cap and trade policy. And in New Hampshire, we presented on the benefits of IRA Rebate Programs. Additionally, we presented at two state energy conferences in the fourth quarter and helped to organize a panel for NEEP's Heating Electrification Summit. At the West Virginia Annual Energy Summit, we presented on NEEP's work on the state's energy plan. NEEP also presented on policies to decarbonize residential buildings at the New Jersey Clean Energy Conference.

NEEP also began the data collection process for the Regional Energy Efficiency Database (REED), which will collect key energy efficiency program metrics for program year 2020 (and 2021 where available) across the NEEP region

and make them publicly available by the first quarter of 2023. REED currently includes energy efficiency program results through program year 2019 in the form of an Excel-based Master REED Workbook (with program savings and expenditures) and a REED Supporting Information report. Additionally, NEEP began a multi-year partnership with the Association of Energy Services Professionals (AESP) in a BENEFIT Grant project with the US DOE to develop a series of accredited online courses focusing on new grid-interactive energy technologies, also commonly referred to as demand flexible loads.

Additionally, NEEP continued to engage with state-level advocates throughout the region by attending meetings in Connecticut, Maryland, New York, and New Jersey. We also attended regional meetings throughout New England where policies and priorities are discussed, including in Massachusetts, Connecticut, Rhode Island, Vermont, New Hampshire, and Maine. Lastly, we tracked bills across the region with our legislative web tracker that includes legislation from the past three years. The tracker is updated weekly and highlights are shared with NEEP's Allies network. NEEP follows new bills closely to identify key target areas and trends, with an emphasis on climate goals and roadmaps, workforce development, equity, and building codes and standards.

Progress Toward 2022 Outcomes	% Complete at Q4
1. Three states (Maine, Maryland, Vermont) adopt a regulatory policy to use a Total Systems Benefit metric or similar measurement that considers real-time energy generation and use for energy efficiency and/or grid planning **Progress Toward Outcome:** This outcome remains at 0% because no state regulatory agency has adopted the Total Systems Benefit metric or considered adoption of a similar metric that breaks down energy usage by the hour. NEEP monitors opportunities where the Total System Benefit metric could be considered in states across the region: • New York has opened an Interim Review concerning their energy efficiency programs. This review is intended to provide an opportunity to assess progress to date and consider modifications that will improve the management of the portfolios, increase the effectiveness of the programs, and ensure alignment with evolving state policies. For energy efficiency programs, the review will assess all meaningful aspects of program design and administration, innovation, government oversight, and adjustments to targets and budgets. • Connecticut is preparing a new Comprehensive Energy Strategy, which examines future energy needs in the state and identifies opportunities to reduce costs for ratepayers, ensure reliable energy, and mitigate the public health and environmental impacts of Connecticut's energy use. NEEP	0%

Progress Toward 2022 Outcomes	% Complete at Q4
presented on the Total System Benefit metric at the stakeholder sessions, but nothing has been decided from the proceeding. • Massachusetts has considered Time Varying Rates in their Grid Modernization Docket. The Total System Benefit metric can help to implement this policy and other policies that look at hourly energy generation and conservation costs.	
2. Three states (Connecticut, Maryland, Massachusetts) embed additional climate and equity considerations in energy efficiency policies, with metrics tied to performance – i.e. GHG goals/tracking metrics, approaches to cost-benefit analysis **Progress Toward Outcome:** NEEP assisted Delaware to expand access to beneficial electrification of equipment through changing the requirements for its low-income heater replacement program. This change did not include metrics tied to performance, but it did embed both equity and climate considerations into the program. Previous progress toward this goal was achieved when: • Massachusetts released their energy efficiency plans in January 2022, which included additional tracking metrics and a performance incentive tied to equity. • Maryland released the order for their 2024 energy efficiency plans, and NEEP was part of the public workgroup for the plans. The plans included the social cost of carbon and an adder for low-income and health and safety benefits to the cost effectiveness test. They also approved a greenhouse gas (GHG) emission goal for the portfolio with a carve-out for low-income savings. • Connecticut DEEP approved the state's energy efficiency plans and mandated that additional climate and equity considerations be a part of the plan. These changes included: development of a Comprehensive Strategic Plan to Address Barriers to Heat Pump Deployment, creation of a new Connecticut Efficiency Test (CTET) that includes metrics to capture GHG emissions and other utility system benefits including reduced arrearages, review of the definition of "equitable distribution," creation of a statewide definition of weatherization, transition to only all-electric new construction programs by 2023, and investigation into the continuation of natural gas incentives.	110%

3. Three states (Maine, Massachusetts, Vermont) advance beneficial electrification policies for implementation by the regulatory agency over electric and/or gas utilities **Progress Toward Outcome:** The Massachusetts Commission on Clean Heat recommended that the state adopt a clean heat standard in 2023. The Commission outlined that the standard should cover natural gas and fuel-based heating systems but could expand to include electric utilities. NEEP will be monitoring the regulatory process to implement this program in 2023. Previous progress toward this goal was achieved when: • In Connecticut, CT DEEP launched initiatives to advance beneficial electrification. These included a standard definition for weatherization, development of a Comprehensive Strategic Plan to Address Barriers to Heat Pump Deployment, transition to only all-electric new construction programs by 2023, and investigation into the continuation of natural gas incentives. • In Massachusetts, the MA DPU approved Mass Save energy efficiency programs that prioritize beneficial electrification. The state increased incentives and deployment for heat pumps. It is also focusing workforce efforts on heating electrification to ensure contractors can serve the new market. Additionally, the DPU has mandated that all homes that receive a heat pump system also receive weatherization within six months of installation. The DPU has also aligned performance incentives with the state's electrification goals, creating an incentive that is tied to program administrators installing heat pumps with weatherization.	100%
4. Three states (Connecticut, Massachusetts, New York) set long-term grid planning policies that prioritize energy efficiency and other demand side resources over the expansion of pipes and wires infrastructure **Progress Toward Outcome:** The Massachusetts Clean Heat Commission report proposed a Joint Energy System Planning process to transition from gas to electric heat and identify infrastructure and other investments needed to accelerate heating technology and optimize energy usage on the grid. State energy and environmental offices, utilities, co-ops, and other stakeholders are set to release a report on the barriers and needed policy changes to start this process by 2024. Previous progress toward this goal was achieved when Connecticut released a decision in the Future of Gas Expansion docket that stops all expansion of natural gas in the state and conversion of homes to natural gas. As justification for winding down the program,	60%

regulators cited the fact that companies have not been able to meet the program goals, gas prices have nearly tripled in the state, and Connecticut's new climate goals do not align with increasing gas expansion. Connecticut is also starting a Performance Based Rates discussion that will tackle how to transform utility rates in the state to incentivize investment in programs that further state goals, including energy efficiency and demand-side resources. Additionally, NEEP is watching many states in the region that have opened dockets on grid planning and/or the future or natural gas as it will likely be in these proceedings that we will see this goal met. Below is an outline of current proceedings we are tracking: • The New York Public Service Commission (NY PSC) initiated a docket on Gas Planning Procedures in March 2020 and issued a Gas System Planning Proposal in February 2021. The Commission has not yet issued a decision. • The Massachusetts Department of Public Utilities initiated the Future of Gas docket in October 2020 and the independent consultant's report was released on March 18, 2022. It presents eight pathways to decarbonization and six regulatory design recommendations. The DPU has not yet issued a decision in the proceeding. • The Rhode Island Public Utilities Commission (RI PUC) has opened a docket to investigate the effect of the 2021 Act on Climate on the regulated gas distribution system in the state. This proceeding will include a stakeholder process to identify goals for the future of the gas system in light of the Act on Climate Law, identify or update principles for ratemaking and regulation, and develop a scope for a report on the future of gas distribution business operations. • Connecticut is updating its Comprehensive Energy Strategy (CES).	

Retrofit Models

NEEP's Retrofit Models project focuses on engaging stakeholders and developing resources that advance whole-home, deep energy retrofit projects and programs across the region. In this program area NEEP works on several discrete projects, including Total Energy Pathways (TEP), TEP Workforce, and NYSERDA's Stacked Efficiency and Electrification project, and tracks other related efforts to advance a regional dialogue on the topic of whole-home retrofits.

2022 marked the end of the second phase of the NEEP's involvement in the Zero Energy Now (ZEN) pilot project in Vermont. ZEN bundles together weatherization, energy efficiency, electrification, and renewable energy upgrades into one comprehensive retrofit project, and was the model for NEEP's Total Energy Pathways project. ZEN achieved its goal to enroll 30 Vermont homes in whole-home retrofit projects over the course of three years. Preliminary analysis demonstrated that these projects resulted in 94% carbon reductions which equates to combined yearly savings of 173 metric tons of carbon dioxide (CO_2). In December 2022, NEEP published a blog outlining these preliminary results. Providing homeowners with one primary point of contact for these comprehensive projects has proven to be a valuable component of this project.

NEEP was a lead contributor in the development of the New York State Energy Research and Development Authority's (NYSERDA) Stacked Efficiency and Electrification Pilot (SEEP) Framework. NEEP led the SEEP Framework Working Group's monthly meetings and weekly coordination calls. In a collaborative process, the team compiled the knowledge of six working group meetings, and over 30 one-on-one interviews into a comprehensive framework document. Sections of the framework include an assessment of program impacts, metrics, financing mechanisms, and more. During NYSERDA's Residential Marketing Advisory Group meeting, NEEP, along with two other members of the SEEP team, presented the framework to the group. The meeting produced significant interest from stakeholders indicating a strong desire to have whole-home programs implemented throughout the state of New York. NEEP envisions that this framework will enable other states and communities to implement whole-home programs.

NEEP is working to bring lessons learned from ZEN, TEP, and SEEP to other states as a carbon reduction solution for homes, including how to benefit from IRA and other federal funding. This blog post identifies some key findings that will inform our work on this in 2023.

A key component of these whole-home programs is ensuring that there is a trained workforce to take on retrofit projects. NEEP addressed this challenge through the Total Energy Pathways Workforce Development project. As

a result of this project, we created an Online Resource Center to provide access to training materials, hiring resources, paid internship programs and more. Rather than being restricted to registering for courses, users can learn on their own time and at their own pace, allowing the project to reach many different groups of applicants. NEEP is also working with partners to develop a BPI certificate of knowledge that identifies contractors who have been trained in managing whole-home decarbonization retrofit projects. The certificate of knowledge will have eight sections, each with a training module associated with it. Collaborating with our project partners – Building Performance Association (BPA), Energy Futures Group (EFG), and Building Performance Institute (BPI) – has been critical to better understanding best practices for the delivery of training modules and locating existing content that can be leveraged for educational materials. The first training module, along with three recorded interviews, were developed in 2022 and will be published at the beginning of 2023. NEEP hosted monthly project meetings with our project partners and quarterly meetings with a larger project advisory committee to help inform the development of the project.

Progress Toward 2022 Outcomes	% Complete at Q4
1. Two energy efficiency programs launch new whole-home/small commercial deep retrofit offerings **Progress Toward Outcome:** In Massachusetts, the Mass Save 2022-2024 plan included a new Deep Energy Retrofit program for commercial and industrial customers to provide technical and financial assistance for businesses to manage energy investments and usage in a holistic manner. New Jersey's Board of Public Utilities launched the Whole House Pilot Program in the city of Trenton. The pilot uses a single point of contact method that braids together funding from state, local, federal, and non-profit programs to target health and safety issues as well as improve the energy efficiency of the house. Trenton was chosen for the pilot because it ranks among the top municipalities in terms of older housing stock and high household energy burden among low-income residents, childhood lead poisoning, and asthma emergency department visit rates.	100%
2. Two states or jurisdictions launch whole-home energy efficiency and decarbonization programs **Progress Toward Outcome:** Pennsylvania passed Senate Bill SB 1135 into law, which apportioned $125 million from American Rescue Plan Act funds to create the Whole Home Repairs Program. The program focuses on supporting underserved populations and will offer $50,000 grants to homeowners to repair, update, and adapt their homes. It also provides funds to develop training and apprenticeship programs to build the	100%

Progress Toward 2022 Outcomes	% Complete at Q4
local workforce. Guidelines for the program are currently being developed and it is expected to open in 2023. The Massachusetts Decarbonization Pathways Pilot launched in 2022 utilizing a newly developed assessment protocol for single-family and low-rise multifamily buildings. The protocol will help homeowners create and implement a comprehensive decarbonization roadmap. Abode Energy was selected to implement the pilot program, which will be split into two cohorts – the first of which began in the second quarter of 2022, and the second of which is slated to begin in 2023 with modifications based on the first cohort. In New York, NEEP continued work with NYSERDA on the Stacked Efficiency and Electrification Pilot. The draft framework was compiled in the third quarter of 2022. SEEP will enable any interested program administrator to develop a successful whole-home decarbonization retrofit program for their territory.	
3. Three retrofit programs consider equity goals and/or financing solutions for income eligible households and business and/or targeted communities **Progress Toward Outcome:** New Jersey's BPU joined Massachusetts and Connecticut by launching the Whole House Pilot Program in the city of Trenton. The pilot will target low-income residents and homes with high household energy burdens. The city of Trenton was selected to run the pilot because it ranks among the top municipalities in terms of older housing stock and high household energy burden among low-income residents, childhood lead poisoning, and asthma emergency department visit rates. Connecticut's Weatherization Barrier Remediation Program targets populations with high energy burdens. The program addresses health and safety issues such as mold and asbestos that prevent the completion of weatherization and energy efficiency measures. The program will help reduce energy burdens experienced by low-income households and will specifically track program benefits across the state to ensure an equitable distribution is occurring. The Mass Save 2022-2024 plan requires program administrators to weatherize homes when installing heat pumps. Weatherization is free for low-income customers and offered at a reduced price for moderate-income homeowners.	100%

Solutions for Low-Carbon States and Communities

In 2022, NEEP engaged numerous state and local stakeholders to provide aid and guidance on building decarbonization initiatives. We were active throughout the year attending and presenting at various events and webinars. In total, five installments of NEEP's Ready, Set, Scale webinar series (Building a Pathway for IRA Funding, Community Approaches to Electrification, Residential Retrofitting at Scale: Whole-Home Approach, Community Decarbonization Planning, and Considerations for an Equitable Building Performance Standard) and six sessions at NEEP's annual Summit were geared toward states and communities. NEEP was also active in both regional and national conferences including the BPA National Home Performance Conference, the BPA Clean Energy for Homes Conference, BuildingEnergy Boston, NASEO's Annual Meeting, the West Virginia Governor's Energy Summit, The Energy Professionals Association (TEPA), and more. At the local level, we held a community education class for the town of Arlington, Massachusetts on the topic of residential electrification. The class highlighted efficient electric technologies and available incentives.

NEEP hosted five meetings of the Community Residential Energy Labeling Cohort for municipal government staff and volunteers who identified home energy labeling as a priority in 2022. The cohort model enabled peer-to-peer exchange and more rapid market transformation by bringing together multiple communities and other topical experts that can help communities adopt labeling programs. The meetings covered identifying the community's priorities and policy goals; distinct labeling options and their pros and cons; legal considerations; and engaging with real estate professionals. Approximately five external partners presented at these meetings to share their expertise. Of the initial ten cohort members, seven were consistently engaged throughout the year.

NEEP also worked with stakeholders on policies that address existing commercial buildings through benchmarking and Building Performance Standards (BPS). Over the course of the year the municipalities of Lexington, Mass., Bedford, N.Y., Cambridge, Mass., Boston, Mass., Philadelphia, Penn., Ann Arbor, Mich., Washington, D.C., and the states of West Virginia, Massachusetts, and Maryland received technical assistance on benchmarking and BPS. NEEP provided significant support to the Maryland Department of Energy on the development of their BPS regulations. This involved meeting coordination, facilitation, research, and synthesizing comments from two stakeholder groups. Ultimately this effort culminated in a complete draft regulation by the end of 2022. NEEP also released a standalone webpage, Center for Building Performance Standards, which compiles and promotes BPS-related resources from across many different organizations. This new website provides guidance to policy makers, program designers, building owners, and contractors and will continue to be built out in the future.

In 2022, NEEP devoted time to understanding and creating resources on new federal funding opportunities, primarily from the BIL. We published three resources in a larger series on federal funding, which focus on community opportunities, rural communities, and schools. The briefs detail priority actions and the associated funding streams that could be used. We collaborated with approximately ten stakeholders for input on the recommendations and resources. In addition to the written resources, we convened a Communities Working Group meeting on federal funding opportunities, with a guest speaker from the US DOE. In December, we shared on community and school district opportunities with federal funding during one of our Ready, Set, Scale webinars.

NEEP's efforts on building energy rating included the development of software tools that help facilitate these programs. We are currently working on four such projects: The Home Energy Labeling Information eXchange (HELIX), the Energy Estimator, Remotely, and the Building Energy Analysis Manager (BEAM):

- **HELIX:** HELIX, a database to house and track energy labels, has been updated with additional home energy labels, certifications, and solar photovoltaic (PV) records. New to the database is data on weatherization program participation in Vermont. NEEP and partner ClearlyEnergy continued to work with Cape Cod multiple listing service (MLS) and SmartMLS, providing SmartMLS with solar PV data that is now available to its members and nearly completing integration with Cape Cod MLS. We also presented to real estate professionals in the Greater Boston Association of Realtors on HELIX, and provided CT DEEP with information for their educational course for real estate professionals. Finally, NEEP met with state partners and another home energy data aggregator in the field to plan for future uses of HELIX.
- **Remotely:** The Remotely project is funded by NYSERDA to scale-up home energy audits and retrofit projects throughout the state of New York. At the end of 2022, we focused on outreach efforts targeting community groups, planning agencies, local governments, contractors, and more. Three lunch-and-learns were held throughout the year to showcase the Remotely tool and engage with potential users. Additionally, Remotely was the main topic of a BPA Clean Energy for Homes Conference that took place in Saratoga Springs in June. Remotely is an innovative project that could lead to the dramatic scaling-up of home energy audits and could streamline the process of home energy retrofits.
- **BEAM:** BEAM is a database platform that facilitates compliance tracking and communication necessary for implementing a BPS. The first jurisdictions were fully onboarded to the platform in 2022 beginning with Washington, D.C. and Cambridge, Mass. NEEP led five training sessions with Cambridge, Washington D.C., and Lexington, Mass. to onboard communities and provided demos to several others including Philadelphia, West Virginia, Ann Arbor, Boston, Lexington, and Newton, Mass. The platform was significantly improved with updates including streamlined communications, a building owner portal, and a building optimization tool. The BEAM Advisory Committee convened four times. Additionally, NEEP convened other regional energy efficiency organizations (REEOs) Southwest Energy Efficiency Project (SWEEP), Midwest Energy Efficiency Alliance (MEEA), and Southeast Efficient Energy Alliance (SEEA) to collaborate on BEAM promotion in regions outside of NEEP's territory. The BEAM tool fills a market gap

as a low-cost management tool for BPS programs and could enable more communities to take on these efforts.

Progress Toward 2022 Outcomes	% Complete at Q4
1. Seven additional jurisdictions develop innovative strategies to reduce carbon emissions, such as zoning requirements, zero energy/decarbonization planning, and zero energy schools **Progress Toward Outcome:** NEEP completed a project with the town of Jamestown, Rhode Island to develop a comprehensive energy plan. The project team solicited input from an advisory committee, got approval from the town's planning commission, and is seeking town-council approval of the plan in early 2023. In Massachusetts, 12 communities signaled their intent to participate in the state's pilot program that would allow each jurisdiction to ban fossil fuels from new construction projects. MA DOER is only accepting 10 participants in this pilot program which is likely to draw interest from additional communities. In West Virginia, NEEP worked with the State Energy Office and other partners to draft a new State Energy Plan. NEEP is providing support to the state and assisting with public engagement sessions. The State Energy Plan will provide a framework for action that the state government can implement related to energy efficiency, workforce development, and more. Charleston, West Virginia completed its first round of building energy benchmarking for the city's public buildings in the second quarter of 2022 and is developing an action plan to meet the City's 20% emissions reduction goal.	100%
2. Three additional jurisdictions adopt home energy labeling and retrofit policies and programs to improve the energy efficiency of existing homes **Progress Toward Outcome:** Bedford, New York drafted an amendment to their rental inspection law to include an energy use audit that building owners would need to provide to prospective renters with the rest of the inspection results. Bedford staff participated in the labeling cohort and spoke with team members throughout the year on how best to write the requirements. In July of 2022, Montpelier, Vermont began the mandatory phase of its time of listing Vermont Home Energy Profile policy.	100%

Progress Toward 2022 Outcomes	% Complete at Q4
A volunteer and two city staff members in Keene, New Hampshire have expressed strong interest in following Vermont/Montpelier in a voluntary labeling program using Energy Estimator to create home energy profiles. NEEP is working with ClearlyEnergy and the city of Keene to discuss the use of a New Hampshire Home Energy Profile created by Energy Estimator. Representatives from Connecticut have expressed interest in following the Vermont model of statewide voluntary labeling using a Connecticut Home Energy Profile generated by Energy Estimator. Seven of the ten communities in the Community Residential Energy Labeling Cohort remained very engaged throughout the year and have expressed strong interest in pursuing a labeling policy in 2023 based on guidance from the cohort. Pennsylvania passed Senate Bill SB 1135 into law, which apportioned $125 million from the American Rescue Plan federal funding to create the Whole Home Repairs Program. The program will offer $50,000 grants to homeowners to repair, update, and adapt their homes. It also focuses on training and apprenticeship programs to build the local workforce. Guidelines for the program are currently being developed and it is expected to open in 2023.	
3. Three additional jurisdictions adopt policies for existing commercial buildings including benchmarking and building performance standards **Progress Toward Outcome:** The passage of the Climate Solutions Now Act of 2022 required the state of Maryland to develop draft BPS regulations by the end of 2022. NEEP supported this process by leading stakeholder engagement efforts, setting priorities, and conducting research. A draft regulation was completed in December 2022. Lexington, Mass. – a smaller jurisdiction – passed a benchmarking bylaw in April 2022 modeled after Boston's 2014 BERDO 1.0. NEEP will remain engaged with Lexington on the implementation of the new policy. Lexington is also using the BEAM tool to manage their program. NEEP is supporting Newton, Mass., as they seek to pass a joint benchmarking and building performance standard policy. Cambridge, Mass. is in the process of advancing	100%

Progress Toward 2022 Outcomes	% Complete at Q4
their building performance standard legislation through city council, which is likely to occur in the coming months. After passing their benchmarking ordinance in 2021, the city of Charleston, West Virginia completed the first year of benchmarking their buildings. Charleston is the first city to do so in the state.	