2022 PORTFOLIO: SCALING UP

VISION: We envision the region's homes, buildings, and communities transformed into efficient, affordable, low-carbon, resilient places to live, work, and play.

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

GOAL: Assist the Northeast and Mid-Atlantic region to reduce building sector energy consumption at least three percent per year and carbon emission at least 40 percent by 2030 (relative to 2001).

Decarbonizing the building sector requires continued innovation *and* rapid scaling of existing solutions. In order to decarbonize with equity, marginalized communities must be prioritized in the transition, and solutions that reduce energy and carbon must also improve the health, safety, comfort, and affordability of homes and buildings and create valuable, well-paid local jobs. This work requires new partnerships, program models, and goals.

Many of the solutions to get to scale are available now. NEEP works through regional collaboration[1], engaging state and local governments, industry and manufacturers, efficiency programs, and other leaders across the Northeast and Mid-Atlantic region to develop and advance scalable energy efficiency solutions. In 2022, alignment on climate goals from the local to the federal level will bring new resources and support to ramp up successful models across the region so that pilots can become programs, technology can be disseminated at scale, successful policies can be replicated, and regional action creates market change. In other areas, continued innovation, new models, and ongoing market priming activities are needed to overcome the barriers to deeper efficiency and the transition away from the use of fossil fuels in buildings. Through peer-to-peer networks, technical assistance, and independent analysis and solution developments, NEEP supports regional cooperation to accelerate the development and dissemination of new solutions.

NEEP is uniquely able offer an approach that combines national expertise with local implementation knowledge to assist states in reaching their climate and clean energy goals. For 25 years, NEEP has worked to transform the energy efficiency market in areas where industry, the workforce, program administrators, and other components of the marketplace benefit from a collaborative, multi-state approach. The combination of cross-cutting skillsets, experience, and existing relationships – typically only available through multiple vendors – makes NEEP uniquely capable to deliver this ambitious project scope and workforce efficiencies.

NEEP's 2022 portfolio focuses on the components key to rapid, equitable decarbonization of the regional buildings sector – strong policies and regulations to address building emissions, market transformation for electric space and water heating, community-led solutions, and replicable program and business models for low-carbon retrofits. Embedded in each of these is workforce development and equity.

[1] NEEP serves thirteen Northeast states and jurisdictions including ME, NH, VT, MA, RI, CT, NY, NJ, PA, DE, MD, DC and WV.

2022 Programs

NEEP's 2022 program portfolio offers six initiatives to engage regional leaders in collaborate to equitably transform our homes and buildings to be efficient and low-carbon through innovative public policy, technology, market, and consumer engagement solutions.

Public Policy and Programs - Successful transition to zero carbon buildings and homes will require market transformation with advanced technological solutions and equitable and fair policy mechanisms. Critical policy areas include comprehensive state and utility policy, building regulation, federal regulation, and alignment with evaluation, measurement, and verification (EM&V).

Building Energy Codes and Appliance Standards - Building energy codes and appliance standards are an essential pathway to reduce demand, energy consumption, and greenhouse gas emissions, drive high performance building practices, protect consumers, and grow local economies. These cost-effective regulatory tools ensure that buildings and homes meet and exceed minimum energy efficiency performance, resulting in communities that are comprised of healthy and resilient homes that are safeguarded against expensive and disruptive future retrofits.

Solutions for Low-Carbon States and Communities - Working at the community level empowers local governments to take action against climate change in a way that is specific to their building stock and population's priorities. Communities can often be more nimble than state or federal government, and can incubate innovative ideas that move faster than what is happening at a state or national level. NEEP supports communities to advance equitable energy and carbon reduction policies and programs, and shares these solutions to accelerate progress regionally.

Retrofit Models - Most of the homes and buildings that will be in our communities in 2050 have already been built, so in order to achieve 2030 decarbonization goals, scalable, cost-effective models are needed to retrofit the existing building stock. At the same time that homes and buildings are retrofit for energy efficiency, other critical needs can be addressed, improving housing affordability, health and comfort, indoor air quality, and resilience to the impacts of climate change.

Heating Electrification Market Transformation – Heating efficiently with renewable electricity instead of directly burning fossil fuels for space and water heating can reduce pollution, lower costs, and support economic development. Improved heat pump technologies, coupled with a decarbonizing grid and state and local government mandates, have created new opportunities to focus policy and programs to significantly reduce the energy and carbon footprint of existing homes and buildings in the Northeast and Mid-Atlantic.

Grid-Interactive Homes and Buildings - Grid-connected or grid-interactive buildings have the ability to shed, shift, or modulate energy use in response to grid communication signals. If used as flexible sources of energy, homes and buildings could have reduced operating costs, increased building value and security, improved comfort and resiliency, and provide grid operators with clean distributed resources and increased reliability.

2022 Approach, Products, and Services

NEEP's Approach

Engage and Empower Stakeholders: NEEP forges partnerships and brings stakeholders together to learn about, develop, advance, accelerate, and integrate advanced energy efficiency and low carbon building-sector solutions with coordinated efforts, learning exchange, and resource leveraging.

Advance Regional Market Transformation Opportunities: NEEP leads, recommends, engages support for, assists, tracks, and reports progress of regional market transformation initiatives that drive innovative advanced building energy efficiency and decarbonization opportunities.

Provide Independent Analysis and Technical Expertise: NEEP conducts independent analysis and serves as a technical expert on building energy efficiency and low-carbon opportunities, policies, programs, technologies, best practices and resources including integration with other demand side resources.

Advance Knowledge and Best Practices: NEEP develops and distributes regional best practice guidance, tools, information and educational resources, and facilitates regional peer exchange for leading edge building efficiency and low carbon solutions.

Demonstrate Thought Leadership: NEEP helps influence the narrative around energy efficiency and building decarbonization by positioning NEEP and its partners as consistent, reliable expert sources of information and resources.

NEEP's Products and Services

NEEP is a mission driven nonprofit motivated core values that underpin everything we do. These values are:

Collaboration – Commitment – Community – Continuous Learning

Public Policy and Programs

A successful transition to zero carbon buildings will require equitable and fair policy mechanisms such as comprehensive state policy, local building regulation, federal regulation, and alignment between policy and regulatory mechanisms. Decarbonizing the building stock requires an all-inclusive set of actions, occurring in parallel and phased in over time, across different sectors and levels of government. Not every state will follow the same path or have the same end goal, but achieving building decarbonization will require innovation and embracing policy solutions that are already demonstrating success.

NEEP works with federal, state, and local government, businesses, energy efficiency program administrators, non-profits, and advocacy groups to identify and disseminate best practice policy solutions. NEEP also conducts research and analysis to identify innovative ways to evaluate and measure the impacts of energy efficiency and other demand-side policies and programs, and serves as a trusted resource for public policy development and implementation.

In the coming year, NEEP will support states and communities in the Northeast and Mid-Atlantic to assess, adopt, and implement effective and equitable policies that advance integrated energy efficiency, heating electrification, and building decarbonization to combat climate change and create a flexible, modern energy grid. These are critical steps to climate stabilization and an equitable, sustainable future energy landscape. New this year will be a regional policy roundup, a three-part series on implementation of decarbonization policy, and a report on climate and equity metrics.

NEEP's 2022 Project Outcomes

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
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
3. Three states (Maine, Massachusetts, Vermont) advance beneficial electrification policies for implementation by the regulatory agency over electric and/or gas utilities
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

NEEP's 2022 Strategies and Activities

Stakeholder Engagement and Collaboration: NEEP facilitates information sharing among federal, state, and local government agencies, efficiency program administrators, industry, non-profits, and advocacy groups to advance and implement public policies and EM&V practices that accelerate energy efficiency and other demand-side resources. NEEP engages organizations by identifying opportunities in policymaking and regulatory processes that often go unnoticed, and by helping organizations participate in a way that furthers their mission. Through these engagement avenues, NEEP facilitates peer-to-peer learning by bringing the best ideas from across the country to our partners.

- Convene and facilitate NEEP's Grid Decarbonization Policy and Evaluation Advisory Group, including quarterly meetings with regional updates, topical webinars, and feedback on briefs and reports
- Collaborate with state-level advocates around opportunities to grow decarbonization policies in the NEEP region

- Support NEEP advisory and working groups in other project areas to highlight important topical policy opportunities and updates

NEEP's 2022 Strategies and Activities Continued

Technical Assistance: NEEP provides customized technical assistance to federal, state, and local government agencies, efficiency program administrators, industry, non-profits, and advocacy groups. This includes research, analysis, and comments in regulatory or other public policy proceedings or technical sessions.

- Technical assistance via research, reports, presentations, or briefings throughout the year
- Participation in state, regional, and national working groups and work with other non-profit organizations, businesses, and other groups to provide energy efficiency and clean energy technology policy insights
- Convene regional state policy leaders to discuss barriers and issues that arise in the implementation of energy efficiency and demand side resources and identify innovative solutions. Topics include: natural gas utilities and their role in the clean energy grid, using new technology in programs, and exploring distributed energy resources on a large scale
- Work with all NEEP program areas to respond to requests for public comments that provide insight and examples for states to design successful smart energy, heat pump, and retrofit programs
- Participate in state-run working groups across the region to disseminate best practices and monitor policy advancements

Tracking and Analysis: NEEP tracks state and local policies and metrics across the region to identify and report on trends and best practices for advancing efficient demand-side solutions to decarbonize the building sector. NEEP maintains an online policy tracker for legislative tracking by state and the Regional Energy Efficiency Database (REED) to track annual energy efficiency program results in the region.

- Weekly public policy tracking updates for NEEP Allies and State Partners
- Web-based Legislative Policy Tracker
- Topical bi-monthly regional legislative tracker blogs
- Quarterly blog series on regional demand-side program trends, based in part on data from the Regional Energy Efficiency Database
- Regional matrix with links to state carbon reduction goals and implementation roadmaps

Tools and Reports: NEEP develops resources that inform state and local public policy for energy efficiency and building decarbonization. These resources highlight public policy leadership and identify energy efficiency and building decarbonization policy and EM&V pathways that focus on climate and equity. These activities include:

- Annual Regional Policy Roundup highlighting state policies and metrics, bills and dockets to watch in each state, and using REED and other data to track progress toward state goals
- Implementing Energy Decarbonization Policy: Three-part report and webinar series highlighting key policy topics. Topics will be informed by partner feedback and may include: Utility Performance Incentives for Climate Goals, Implementing Grid-Wide Distributed Energy Resources, Developing an Energy Efficiency Workforce.
- Cross-cutting policy and EM&V report on climate and equity metrics in energy efficiency and other grid planning.
- Development and maintenance of NEEP website resources, including Data & Metrics for Decarbonization Policies and State and Local Policy Tracking, Analysis, and Technical Assistance
- Regional Energy Efficiency Database

- Blogs on the topics of energy and climate policy in NEEP region states, evaluation best practices for energy efficiency and grid decarbonization, and key policy and evaluation topics

NEEP's 2022 Strategies and Activities Continued

Thought Leadership: NEEP influences the narrative around effective and equitable building decarbonization policies and programs by positioning NEEP and its partners as consistent, reliable expert sources of information and resources.

- NEEP 2022 Summit and other events to share work and influence decision makers
- Develop communications program (blogs, interviews, articles, joint papers) to broadcast work, building a broader cohort of engaged partners
- Highlight and champion solutions in regional and national forums
- Representation on national committees, and regional and state boards and committees

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Building Energy Codes and Appliance Standards

Building energy codes and appliance standards ensure that buildings and homes meet and exceed minimum energy efficiency performance. In the NEEP region, the energy savings potential from adopting model energy codes and appliance standards is more than $74.61 billion in energy cost savings. Adopting model energy codes and appliance standards would provide $3.24 billion in annual energy cost savings and 18.50 MMT in annual avoided CO2 emissions (annually by 2030). Adopting updated codes and standards is essential to ensure that our communities are comprised of healthy and resilient homes that prevent expensive and disruptive retrofits in the future.

There is a need for holistic and equitable solutions for improving the adoption and implementation of codes, electrification, appliance standards, and related policies like zoning. NEEP's regional building energy codes and appliance standards work helps ensure that NEEP states continue to be national leaders in building decarbonization. NEEP provides technical assistance to states and other stakeholders to adopt and advance leading-edge, cost-effective energy and carbon savings codes and standards that center equity. NEEP brings together key stakeholders, resources, and research data to build knowledge and understanding to propel the equitable adoption and implementation of building energy codes, electrification/zero energy codes, and appliance efficiency standards policies and programs.

NEEP's 2022 Project Outcomes

1. Four additional Northeast and the Mid-Atlantic states adopt electrification/zero energy stretch codes (DE, MA, NY, RI); Two additional Northeast and the Mid-Atlantic states adopt stretch codes (CT, NJ)
2. Municipalities in six states (CT, DE, MA, MD, NH, WV) adopt zero energy building codes
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
4. Five states (CT, MD, NY, PA, VT) adopt appliance standards, and four (MA, ME, NJ, RI) implement adopted standards

NEEP's 2022 Strategies and Activities

Stakeholder Engagement and Collaboration: NEEP brings together key stakeholders, resources, and data to build knowledge and understanding to advance the adoption and implementation of updated building energy codes, zero energy codes, and appliance efficiency standard policies and programs. NEEP will leverage state, federal, and national resources with community perspectives to inform state plans and policies that address equity barriers within energy codes and appliance standards.

- Convene and facilitate NEEP's Regional Building Energy Codes and Northeast/Mid-Atlantic Appliance Standards stakeholder groups; includes quarterly working group meetings, topical webinars, and email updates
- Convene and facilitate a Massachusetts Achieving Zero Energy (MAZE) building energy codes stakeholder group; includes quarterly working group meetings, topical webinars, and email updates
- Convene and facilitate codes collaboratives in New Jersey, New Hampshire, Maine, and Pennsylvania; includes quarterly working group meetings, topical webinars, and email updates
- Monitor, communicate, collaborate, present, and coordinate with national and regional organizations (e.g., Regional Energy Efficiency Organizations (REEOs), National Association of State Energy Officials (NASEO), Appliance Standards Awareness Project (ASAP), Responsible Energy Codes Alliance (RECA), International Code Council, Inc. (ICC)), US Climate Alliance, NAACP CESBS, and Green and Healthy Homes Initiative)

NEEP's 2022 Strategies and Activities Continued

Technical Assistance: NEEP provides direct technical assistance to states and communities, including model energy codes, stretch codes, zero energy codes, zoning regulations, and appliance efficiency standard policies and programs.

- Provide recommendations, comments, and technical reference materials on code adoption, amendments, and proposals to state code boards
- Support baseline code compliance studies
- Furnish model language, tools, and resources for state appliance standards adoption and implementation.
- Offer technical assistance to states and municipalities on zoning, code legislative alignment, model sustainable zoning language, and virtual inspections
- Impart training and education best practices for codes and appliance standards
- Conduct research and analysis to support states' codes and appliance standards adoption, compliance, and enforcement

Tracking and Analysis: NEEP tracks and analyzes leading efforts and progress across the region and facilitate peer exchange to inspire and transfer learning.

- NEEP web-based State by State Energy Code Tracker, Energy Code Policy Resource Center, and State by State Appliance Standards Tracker
- Tracking of existing and emerging decarbonization policies through building energy codes (e.g., zoning and municipal ordinances)
- Tracking of emerging building performance standards and state energy code alignment

Tools and Reports: NEEP's works to advance strategies, tools, and best practices for state and local government leaders to adopt and effectively implement updated building energy codes and appliance standards. NEEP will produce briefs and white papers on the decarbonization of the built environment for codes and standards.

- Maintain online resource center and toolkits (adoption toolkit, compliance toolkit, appliance standards toolkit)
- Maintain and update NEEP's State Appliance Standards Database
- Briefs and white papers on topics to be determined by stakeholder needs (topics could include energy storage, all electric buildings and homes, insurance underwriting, building performance standards, and air regulations)

Thought Leadership: NEEP influences the narrative around building energy codes and appliance standards by positioning NEEP and its partners as consistent, reliable expert sources of information and resources.

- NEEP 2022 Summit and other events to share work and influence decision makers
- Develop communications program (blogs, interviews, articles, joint papers) to broadcast work, building a broader cohort of engaged partners
- Highlight and champion solutions in regional and national forums
- Representation on national committees, and regional and state boards and committees

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Solutions for Low-Carbon States and Communities

Addressing greenhouse gas emissions from the buildings sector is essential to achieving state and local climate and equity goals, as is engaging and investing in our communities. There remains vast opportunity for energy efficiency improvements in our region's residential and commercial buildings, and significant work to center energy equity in that work. To do so, we must engage communities that have been historically marginalized and/or excluded from energy decision-making processes.

The Solutions for Low-Carbon States and Communities project delivers innovative efficiency and decarbonization solutions for new and existing buildings. These solutions are intended for state and community leaders across agencies to break down silos and take a more collaborative approach to implementing climate policies and achieving goals. This project utilizes stakeholder engagement, resource and tool development, and technical assistance to deliver customizable solutions to state and community energy decision-makers. Many state and community agencies are under-resourced or bandwidth constrained and can benefit from the support offered by NEEP's technical assistance, collaboration opportunities, and resources.

Through this project, NEEP develops and shares best practices for policy and program design related to home energy labeling, building energy benchmarking, building performance standards, high performance schools, and community-wide policy initiatives. New in 2022, we will host topic-specific cohorts to engage states and communities in a focused effort to increase the market penetration of benchmarking, labeling, performance standards, and school initiatives. This project supports collaboration between state and community stakeholders to more rapidly advance clean energy initiatives while increasing equitable access to energy efficiency programs across the region.

NEEP's 2022 Project Outcomes

1. Seven additional jurisdictions develop innovative strategies to reduce carbon emissions, such as zoning requirements, zero energy/decarbonization planning, and zero energy schools
2. Three additional jurisdictions adopt home energy labeling and retrofit policies and programs to improve the energy efficiency of existing homes
3. Three additional jurisdictions adopt policies for existing commercial buildings including benchmarking and building performance standards.

NEEP's 2022 Strategies and Activities

Stakeholder Engagement and Collaboration: NEEP engages key stakeholders to share expertise and lessons learned to help states and communities achieve their decarbonization goals. NEEP will engage stakeholders in a facilitated learning exchange to guide development of benchmarking and disclosure programs, zero energy schools, and other related decarbonization efforts. NEEP will contribute to and leverage state and national resources to inform community resources and planning.

- Develop a network of local energy champions; convene and facilitate NEEP's topical working groups (e.g. schools, residential labeling, building performance standards , etc.); develop topic-specific cohorts (i.e. project specific engagements with multiple communities to advance initiatives)

NEEP's 2022 Strategies and Activities Continued

Stakeholder Engagement and Collaboration Continued

- Monitor, communicate, present, and coordinate with national and regional organizations (e.g., Massachusetts Facilities Administrators Association (MFAA), state specific ZE working groups, NH Local Energy Solutions, Metropolitan Area Planning Council (MAPC), Energy Efficient West Virginia (EEWV) Delaware Valley Regional Planning Commission (DVRPC), , Vermont's energy labeling working group, USDN, Rocky Mountain Institute Building Accelerators, Equitable Decarbonization/Environmental Justice Group, NAACP's Center for Equity in the Sustainable Building Sector, and National Association of Realtors®)

Technical Assistance: NEEP provides direct technical assistance to states and communities on areas such as home and building labeling, bencmarking, zero energy plans, and whole home retrofit solutions.

- Present to government staff, relevant committees, and other community members
- Develop fact sheets and other guiding materials
- Assist with development and implementation of state and local energy efficiency policy
- Provide guidance to multiple state and local governments through topic-specific cohorts to rapidly advance efforts in communities throughout the region

Tracking and Analysis: NEEP tracks state and community initiatives, analyzes data and trends, and promotes these regional highlights in various forms.

- Update existing and develop new maps, dashboards, and other interactive tools that track trends related to labeling, benchmarking, building energy performance standards, high performance schools, retrofits, and community climate commitments
- Customized tracking and analysis based on stakeholder interests

Tools and Reports: NEEP advances the development of strategies, tools, and best practices to move communities forward in their efficiency planning by providing best practice tools and resources developed by NEEP and others (e.g., U.S. DOE, U.S. EPA, Collaborative for High Performance Schools (CHPS), Institute for Market Transformation (IMT), New Buildings Institute (NBI), and others).

- Maintain and update CAPEE with at least one new module based on input from the Regional Communities Working Group.
- Maintain and update Online Resource center
- Maintain and develop resources to advance zero energy schools at the community and state levels
- Highlight exemplary projects, policies, and programs as determined by stakeholder needs
- Maintain and update data in Home Energy Labeling Information eXchange (HELIX)*
    - Expand usage of Energy Estimator – Powered by HELIX and ClearlyEnergy
- Maintain, update, and expand the usage of Building Energy Analysis Manager (BEAM)*
- Center for Building Performance Standards – solutions for building owners & policy makers

NEEP's 2022 Strategies and Activities Continued

Thought Leadership: NEEP influences the narrative around home energy labeling, building energy benchmarking, building performance standards, whole-home retrofits, and community-wide planning initiatives positioning NEEP and its partners as consistent, reliable expert sources of information and resources.

- NEEP 2022 Summit and other events to share work and influence decision makers
- Schools Summit to focus on public school buildings as an avenue for health, productivity, and environmental stewardship
- Develop communications program (blogs, interviews, articles, joint papers) to broadcast work, building a broader cohort of engaged partners
- Highlight and champion solutions in regional and national forums
- Develop a series of short podcasts
- Facilitate facility tours
- *ACE in an Instant* regional newsletter
- Representation on national committees, and regional and state boards and committees

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Retrofit Models

The majority of homes and buildings standing in our communities in 2050 have already been built, so in order to achieve decarbonization goals, we need scalable, cost-effective solutions to retrofit the existing building stock. While homes and buildings are retrofit for energy efficiency, other critical needs can be addressed by improving housing affordability, health and comfort, indoor air quality, and resilience to the impacts of climate change. Across the NEEP region, states and communities are leading with policies and regulations that encourage and often require building upgrades, but retrofitting existing buildings for a low- and no-carbon future is complex, disruptive, and expensive. Replicable technical solutions, program and business models, financing options, and a trained workforce must be rapidly scaled to successfully accelerate the market for building retrofits.

Through the Retrofit Models project, NEEP engages market actors to share and implement successful program, technology, business, and financial models for home and business retrofits at scale. NEEP works with partners to identify barriers to adopting programs, and provides analysis, research, tools and technical assistance to overcome identified barriers and deploy successful solutions. In the residential sector, NEEP spearheads the regional scale-up of whole-home deep energy efficiency and decarbonization models that can be adopted by utility, state, trade assocaitions, or community programs. This work includes adapting and scaling a succesful model, Total Energy Pathways, focused on addressing barriers in program design, workforce development, and financing. In 2022, NEEP will work to transfer elements of the succesful residential work to the small business sector, a perennial hard sector to reach.

NEEP's 2022 Project Outcomes

1. Two energy efficiency programs launch new whole-home/small commercial deep retrofit offerings
2. Two states or jurisdictions launch whole-home energy efficiency and decarbonization programs
3. Three retrofit programs consider equity goals and/or financing solutions for income eligible households and business and/or targeted communities

NEEP's 2022 Strategies and Activities

Stakeholder Engagement and Collaboration: NEEP connects key stakeholders to accelerate the adaptation and adoption of retrofit models for existing homes and buildings. NEEP will monitor and participate in national and international efforts in the building retrofit market, bringing initiatives and successes from the region and beyond to state and national partners through a program of stakeholder engagement and outreach, building interest and momentum for advancing solutions through the region.

- Monitor, communicate, present, and coordinate with national and regional organizations (e.g., Stacked Energy Efficiency Pilot (SEEP), NYSERDA's Residential Market Advisory Group, MA Decarbonization Pilot Advisory Group, EnergyFirst Mortgage Advisory, NASEO, BBI, BPA, Regional Energy Efficiency Organizations, and U.S. DOE)
- Convene and facilitate NEEP's Total Energy Pathway (TEP) Advisory Committee to accelerate the adoption of TEP-like models across the region. Includes quarterly meetings, topical webinars, and email updates. Topics include program design, workforce development, and financing solutions.
- Convene and facilitate NEEP's Commercial Retrofit Cohort, focused on the small business applications of TEP. Includes quarterly meetings, topical webinars, and email updates
- Coordinate Retrofit Models activities with Community Solutions stakeholders, so that home and building performance policies can be supported by appropriate market models.

NEEP's 2022 Strategies and Activities Continued

Technical Assistance: NEEP provides direct technical assistance to implementers such as program administrators, states, and communities that can design and implement whole home and commercial building retrofit solutions.

- Presentations to government staff, relevant committees, and other community members
- Development of mixed-media workforce training resources
- Assist with the development and implementation of state and local energy efficiency policy and financing programs

Tracking and Analysis: NEEP tracks new and developing models at the regional, national, and international level, analyzes data and trends, and promotes these highlights and best practices in various forms to regional partners. NEEP supports time- and resource- limited organizations by bringing the "best of the rest" to regional leaders. This includes:

- U.S. Department of Energy and other initiatives on PAWS (Partnership for Advanced Window Solutions), advanced building construction, and small commercial business
- Customized tracking and analysis based on stakeholder interests

Tools and Reports: NEEP undertakes research and develops reports in order to overcome barriers to accelerated deployment of solutions. This work, based on needs identified through work with stakeholders, includes targeted research, case studies, white papers, and briefs on topics including advanced technologies for retrofits, equity in program design and measurement, sustainable workforce development, and financing options.

- Total Energy Pathways roadmap for the region
- Getting to Scale retrofit brief series, focused on equity and financing models
- Develop a "Retrofit Program in a Box" program – Total Energy Pathways for small commercial buildings
- TEP Online Resource Center – Workforce Training Resources

Thought Leadership: NEEP influences the narrative around whole-home and building retrofits, ways to implement energy efficiency and decarbonization, workforce development, and financing by positioning NEEP and its partners as consistent, reliable expert sources of information and resources.

- NEEP 2022 Summit and other events to share work and influence decision makers
- Develop communications program (blogs, interviews, articles, joint papers) to broadcast work, building a broader cohort of engaged partners
- Highlight and champion solutions in regional and national forums
- Representation on national committees, and regional and state boards and committees

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Heating Electrification Market Transformation

All states in the Northeast and Mid-Atlantic region have established aggressive long-term greenhouse gas (GHG) reduction goals and are in the process of creating specific plans to achieve those goals. Replacing building technologies that use fossil fuels with technologies that use electricity has been established as one of the critical pathways to achieving these goals. Space and water heating make up over 90 percent of all direct carbon emission from homes and buildings in the region. Heat pump technologies, including a wide variety of cold climate air source heat pumps (ccASHP), ground-source heat pumps (GSHP), and heat pump water heaters (HPWH), offer households and businesses important solutions to reduce and eliminate these emissions. Electrifying heating also improves indoor air quality, and reduces risks related to combustion, creating safer and healthier buildings.

NEEP works to accelerate market adoption of high-efficiency residential and commercial heat pumps for space and water heating through multi-sector stakeholder collaboration. Informed by this collaborative network, NEEP develops strategies, tools, and resources for key strakeholders such as policy makers, program administrators, advocates, and industry to implement through their unique market channels.

Over time, this work has expanded to provide high performance product specifications and products lists, best practice guidance for consumer education, tools for quality heat pump installation, workforce development, and coordinated technology and market research for a broad range of high performance heat pump options for cold climates. NEEP projects that broad adoption and coordinated implementation of these strategies and tools will remove market barriers and lead to dramatic scaling of heat pumps across the region.

NEEP's 2022 Project Outcomes

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.
2. 30 percent increase in annual sales of residential-size ASHP systems across the NEEP region. *(This information will be available in the summer of 2023)*
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.
4. Fifty regional stakeholders engage NEEP's new regional Advanced Water Heating working group to establish highest priority regional market transformation strategies.

NEEP's 2022 Strategies and Activities

Stakeholder Engagement and Collaboration: NEEP engages a diverse group of stakeholders, including industry, efficiency programs, state and local government, U.S. DOE, U.S. EPA, national labs, advocates, and organizations serving underserved and historically marginalized communities to develop and advance long-term regional market transformation strategies to speed the market introduction and adoption of high performance heat pumps for space and water heating. NEEP will monitor and participate in national efforts in the heating electrification market, bringing initiatives and successes from the region and beyond to state and national partners through a program of stakeholder engagement and outreach, building interest and momentum for advancing solutions through the region.

- Convene and facilitate working groups for Residential ASHPs, Commercial ASHPs, and Advanced Water Heating; includes quarterly working group meetings, subcommittee meetings, and email updates
- Lead multi-party collaborative research project into heat pump performance and metrics

NEEP's 2022 Strategies and Activities Continued

Stakeholder Engagement and Collaboration Continued:

- Collaborate with federal agencies such as U.S. EPA, U.S. DOE, Natural Resources Canada, and National labs
- Collaborate with other regional organizations advancing heating electrification (i.e. Heat Pump Coalition, Regional Energy Efficiency Organizations, Rocky Mountain Institute, Green Urban council, Building electrification League, Building electrification Initiative, NY-GEO, Geo Exchange, advocacy organizations, community-based organizations (CBOs), etc.)

Technical Assistance: NEEP provides direct technical assistance to stakeholders, such as program administrators, policymakers, industry, and advocate organizations. Technical assistance topics include:

- Regional/national market insights
- Policy/program design best practices, including equity considerations
- Heat pump performance and ratings
- Consumer/installer education
- Regional/national research activity
- Refrigerant regulation best practices

Tracking and Analysis: NEEP expands its collaboration with states, program administrators, U.S. DOE, U.S. EPA, national labs, REEOs, and others to track, assess, and provide initiative members critical insights into the regional landscape for heat pumps across policy, program, technology and progress towards market transformation.

- Space and water Heating Electrification Public Policy tracker
- Space and water Heating Electrification Program tracker
- Online repository of strategic electrification reports/analysis/resources

Tools and Reports: NEEP develops market and program facing tools to support the broad use of ccASHPs and Heat pump water heaters. NEEP will support initiative expansion to include additional high performance heat pump technologies for space and water heating, expand scope of the Cold Climate ASHP Product List, and update best practice resources for consumers and installers

- Progress Report: Heat Pump Market Transformation Strategy Implementation and Results
- Maintain and update NEEP's ccASHP Specifications and Product List (currently includes categories for ccASHP, ccVRP and ccPTHP).
- Develop new specifications for additional heat pump categories (likely including air-to-water heat pumps and roof-top packaged heat pumps)
- Update ASHP**/**VRF installer guides
- Update ccASHP Product List Sizing Visualization Tool
- Develop ASHP Program Best Practice Toolkit
- Develop ccASHP Product List Rebate Search Tool
- Brief: Public Policies to Prioritize for Heating Electrification

NEEP's 2022 Strategies and Activities Continued

Thought Leadership: NEEP influences the narrative around heating electrification market transformation by positioning NEEP and its partners as consistent, reliable expert sources of information and resources on ASHPs, GSHPs, and HPWHs.

- NEEP 2022 Summit and other events to share work and influence decision makers
- Annual Heating Electrification Workshop to explore approaches for electrifying the heating and cooling sector while guaranteeing quality and comfort for occupants
- Develop communications program (blogs, interviews, articles, joint papers) to broadcast work, building a broader cohort of engaged partners
- Highlight and champion solutions in regional and national forums
- Representation on national committees, and regional and state boards and committees
- Collaborate with New Buildings Institute (NBI) and other organizations on the national Advanced Water Heating Initiative (AWHI)

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Grid-Interactive Homes and Buildings

With broad commitment to decarbonization, the region is moving towards a renewable electric grid, increasing deployment of distributed energy resources, and electrifying several key end uses in homes and buildings. The combination of these important strategies presents multiple challenges for affordable, reliable, high-quality electric service for everyone. It is critically important that homes and buildings are not only efficient, but flexible and able to interact with the grid to meet both grid and customer needs. This will allow grid-interactive products and systems – combined with a clean, flexible grid – to assist states in reaching decarbonization goals.

Historically, homes and buildings have been considered only users of energy. However, grid-interactive or grid-connected buildings have the ability to shed, shift, or modulate energy use in response to grid conditions. If used as flexible sources of energy, homes and buildings will have reduced operating costs, increased value and security, improved comfort and resiliency, and provide grid operators with reduced generation and increased reliability. Grid-interactive buildings are also a critical component in an electrified future. Rapidly scaling the uptake of grid-connected appliances and building systems requires policy and regulatory support, advances in technology and technology uptake, and new business models.

In order to achieve this reality, homes and buildings must include grid-interactive technology, business models must be developed to support consumer uptake, and policy and regulatory frameworks must provide certain pathways for grid modernization. It is imperative that policies, programs, and technology are designed and implemented equitably so that the region's oldest homes and historically marginalized communities are at the forefront of the transition. Without this evolution, the costs of electrification will be higher than necessary and the burden will continue to fall on those who have disproportionately shouldered it.

In 2022 NEEP will expand its work to develop and advance long-term regional market transformation strategies to speed adoption of both grid-interactive technologies and the associated regulatory framework necessary to facilitate building decarbonization. NEEP will work with stakeholders to identify the priority barriers to adoption of grid-interactive homes and buildings and then lead the development and uptake of innovative policies, regulatory action, and residential and commercial programs that help recognize the grid potential of every building and home. While efforts to date have helped demonstrate the opportunities associated with modernized grid technology, innovative programs and grid-interactive homes and buildings, the region requires collaboration to bring these early learnings to scale.

NEEP's 2022 Project Outcomes

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)
2. Three states offer incentive programs for grid-interactive appliances and equipment (including storage) with special consideration for overcoming equity barriers
3. Three states launch grid-interactive homes and buildings demonstration projects

NEEP's 2022 Strategies and Activities

Stakeholder Engagement and Collaboration: NEEP engages diverse stakeholders, including state and local government, efficiency programs, industry, U.S. DOE, U.S EPA, national labs, and advocates, to develop and advance long-term regional market transformation strategies to speed adoption of both grid-interactive home and building technologies and the associated regulatory framework necessary to facilitate building decarbonization.

- Convene and facilitate a regional Grid-Interactive Homes and Buildings Working Group; includes quarterly working group meetings, topical webinars, and email updates
- Monitor, communicate, present, and coordinate with national and regional organizations (e.g., U.S. DOE, U.S. EPA, Regional Energy Efficiency Organizations, NASEO, NECPUC, Building Performance Association, NBI, SEPA, ACEEE, CEE, E-Source, and advocacy organizations)

Technical Assistance: NEEP provides direct technical assistance to states, communities, consumers, and advocates regarding grid-interactive homes and buildings including:

- Assistance to state energy and other government staff pursuing building decarbonization
- Provide response to public comments that explore the use of this technology
- Educate advocates about grid-interactive homes and buildings and policy opportunities

Tracking and Analysis: NEEP tracks and reports on relevant grid-interactive homes and buildings technologies trends, policy and program activity, pilots and technology demonstrations, the role of such devices to optimize energy performance to help our partners build market momentum to overcome identified market, technology and policy barriers.

- Grid-interactive Homes and Buildings Policy and Program Matrix, including tracking of grid-interactive demonstration projects throughout the region.
- Grid-interactive Homes and Buildings Resource Center on NEEP's website

Tools and Reports: NEEP develops new strategies and tools for programs and industry to advance the market adoption of grid-interactive homes and buildings technologies and programs.

- Two briefs on topics determined by stakeholder needs (topics could include priority policies, strategies, regulation for grid-interactive homes and buildings and the role of AMI in building decarbonization)

Thought Leadership: NEEP influences the narrative around grid-interactive homes and buildings, strategic energy management, and smart energy technologies, by positioning NEEP and its partners as consistent, reliable expert sources of information and resources.

- NEEP 2022 Summit and other events to share work and influence decision makers
- Grid-interactive Homes and Buildings Workshop to highlight regional learnings and explore collaborative efforts to advance a modern grid
- Develop communications program (blogs, interviews, articles, joint papers) to broadcast work, building a broader cohort of engaged partners
- Highlight and champion solutions in regional and national forums
- Representation on national committees, and regional and state boards and committees

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