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REGULATORY
ASSISTANCE PROJECT

DECARBONIZING BUILDINGS:
How States Can Set the Table for Success

JUNE 2024

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Acknowledgements

This report reflects the invaluable contributions of three organizations: Northeast States for Coordinated Air Use Management (NESCAUM), Regulatory Assistance Project (RAP)®, and Northeast Energy Efficiency Partnerships (NEEP).

NESCAUM is the association of air quality agencies in the six New England states, New Jersey, and New York. The oldest regional air quality organization of its kind, NESCAUM provides technical and policy support to states on air quality and climate change and serves as a forum for states to work collectively to advance zero-emission buildings and vehicles, both regionally and nationally. Today, NESCAUM addresses a wide spectrum of air quality, climate, and energy issues and provides a forum for states to work collectively to advance zero-emission buildings and vehicles, both regionally and nationally.

RAP is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future. Founded in 1992 as a project to help U.S. utility regulators improve energy planning, RAP has grown into an international organization providing thought leadership and technical assistance to energy policymakers in the United States, Europe, China, India and elsewhere around the world.

NEEP was founded in 1996 as a non-profit whose mission is to serve the Northeast and Mid-Atlantic to accelerate regional collaboration to promote advanced energy efficiency and related solutions in homes, buildings, industry, and communities. Our vision is that the region's homes, buildings, and communities are transformed into efficient, affordable, low-carbon, resilient places to live, work, and play.

We would like to recognize the report's lead authors, Erin Cosgrove, Yiran He, and Luke Miller, NEEP; Emily Levin and Marika Tatsutani, NESCAUM; Nancy L. Seidman, Richard Cowart, and Raphael Breit, RAP. Formatting and edits were provided by Lisa Cascio, Director of Communications and External Relations, Owl Eye Edits, and designMind.

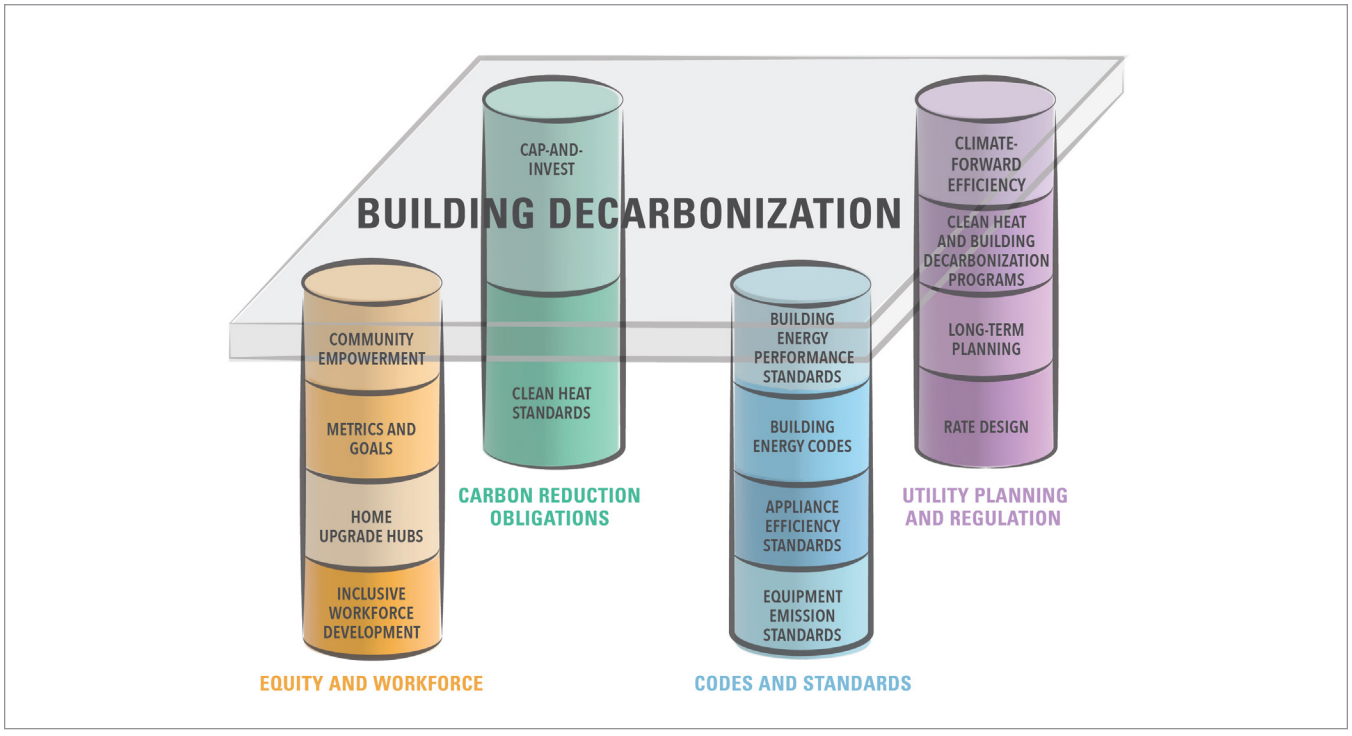
Disclaimer: NEEP verified the data used for this white paper to the best of our ability. This paper reflects the opinion and judgments of the NEEP staff and does not necessarily reflect those of NEEP Board members, NEEP Sponsors, or project participants and funders.

Executive Summary

Decarbonizing buildings is essential to achieving broader climate goals, which demand rapid progress toward economy-wide decarbonization. Getting there will require thoughtful policy approaches, as building decarbonization involves actions by thousands of individual building owners, as well as installers, builders, distributors, retailers, manufacturers, and energy providers. No single policy will suffice—rather, a whole suite of actions will be required across the supply chain. States, in particular, have an important role to play in catalyzing a just transition to decarbonized buildings; states establish building energy codes, regulate emissions under state and federal air quality laws, and oversee energy providers, such as electric and gas utilities.

The first part of the brief presents a comprehensive policy framework for states to advance building decarbonization. It describes four key policy areas, which can be thought of as legs of a table for effectively supporting building decarbonization:

- **Equity and workforce investments** address housing and workforce inequities by empowering historically marginalized communities and ensure that the energy transition is just and inclusive.
- **Carbon reduction obligations** set performance requirements for obligated parties, such as energy providers, to reduce carbon emissions or install clean heating systems.
- **Codes and standards** establish a clear timetable for improving the energy performance of buildings and equipment, spurring changes in technologies and building practices.
- **Utility planning and regulation** sets mandates and frameworks to ensure that utility investment, rates, and programs align with building decarbonization goals.



For each "leg," this brief describes a range of specific policy options, from standards and market-based strategies to voluntary approaches and direct investments, that states can take to decarbonize buildings. These options can be adapted to fit states' specific goals and context, but an approach that includes all four legs is essential to achieve the breadth and scale of impact needed to meaningfully advance climate goals. While the brief focuses on state-level action, it is worth emphasizing that many of these policy options can be adapted and applied by cities, counties, air quality control districts, and other interested jurisdictions.

The second part of this brief presents case studies and outlines key principles to guide state decisionmakers as they consider specific policy options and develop a comprehensive strategy for setting their own building decarbonization table. These design principles are summarized below:

Promote cohesive, coordinated policies across agencies

Because building decarbonization policies are likely to straddle state agencies and regulatory entities with different but overlapping authorities, states will need to consider the goals of the policy or program, the entities being targeted, and the roles different agencies have played in the past to create a cohesive strategy that clearly delineates agency responsibilities.

Balance incentive-based and standard-based policies

To create certainty about outcomes while providing flexibility for the transition, states will need to balance policies that rely on incentives, such as utility energy-efficiency programs, with policies that provide clear regulatory signals, such as energy codes and zero-emission equipment standards. Combining incentive-based and standard-based policies will provide space for the marketplace to find innovative solutions while ensuring steady progress toward equitable building decarbonization.

Work toward a seamless marketplace experience

As states enact different policies, it will be important to consider how various requirements and incentives affect customers and market actors, such as building owners, contractors, wholesale distributors, and retailers. Policy design and implementation can be coordinated to provide a more streamlined experience and avoid duplicative administrative steps. For example, a building owner who is subject to a building performance standard might be able to access incentives from both a clean heat standard-funded program and a utility efficiency program, which could be combined behind the scenes to present a seamless customer experience.

Track results and greenhouse gas impacts across programs

As states enact multiple building decarbonization policies, it will be important to set clear goals for all programs and develop a robust system of accountability and reporting so that policies and programs can be adjusted over time. States should establish a framework for monitoring progress toward climate and energy goals that helps them understand the collective impact of their policies, as well as the contribution of individual policies and programs to emission reductions. Robust tracking and reporting will enable states to monitor their progress toward statewide decarbonization goals and scale up the most effective policies and programs.

The brief closes with real-world examples of comprehensive policy approaches from California, Massachusetts, Maryland, the District of Columbia, and Washington. All these jurisdictions have adopted a combination of strategies to advance building decarbonization as a critical element for achieving broader climate goals.

Introduction

States throughout the country are setting ambitious goals for economy-wide decarbonization and looking for new policies to address the building sector. This is because buildings are a significant contributor to climate and air pollution, accounting for 35 percent of energy-related greenhouse gas (GHG) emissions in the United States. Emissions from residential and commercial buildings, mostly attributable to heating and cooling demand, have increased in recent years. Decarbonizing buildings is a difficult task, as it involves actions by thousands of building owners and market actors across thousands of geographically dispersed structures. In addition, the building stock turns over slowly, limiting touchpoints for intervention. No single policy will suffice—rather, a whole suite of actions will be required from government agencies, regulated entities, private companies, and building owners and occupants. Equitable building decarbonization policies will also need to overcome funding challenges, housing inequities, workforce demands, and grid constraints, while delivering improved health, affordability, and resilience to households and communities.

To date, states are tackling building decarbonization in many ways, but no state is yet on track to achieve zero-emission buildings. States have primarily addressed the building sector through climate goals, energy-efficiency programs, and building energy codes. Each of these policies is useful, but each also has important limitations. Climate goals and targets, for example, help to set the overall policy ambition but they are typically not enforceable and may not lay out specific steps for achieving stated goals. Energy-efficiency programs aim to reduce energy consumption, but most are not yet designed to lower GHG emissions specifically; in addition, ratepayer-funded energy-efficiency programs alone are unlikely to provide sufficient resources for decarbonizing the entire building stock. Further, because these programs rely on voluntary participation, they could also be missing the homes (and homeowners) that need help the most. Finally, building energy codes can be used to transform new construction practices, but these codes reach only a small portion of the building stock while leaving existing buildings largely unaddressed. Building codes also face challenges related to compliance and enforcement as they are hard to manage and oversee once enacted.

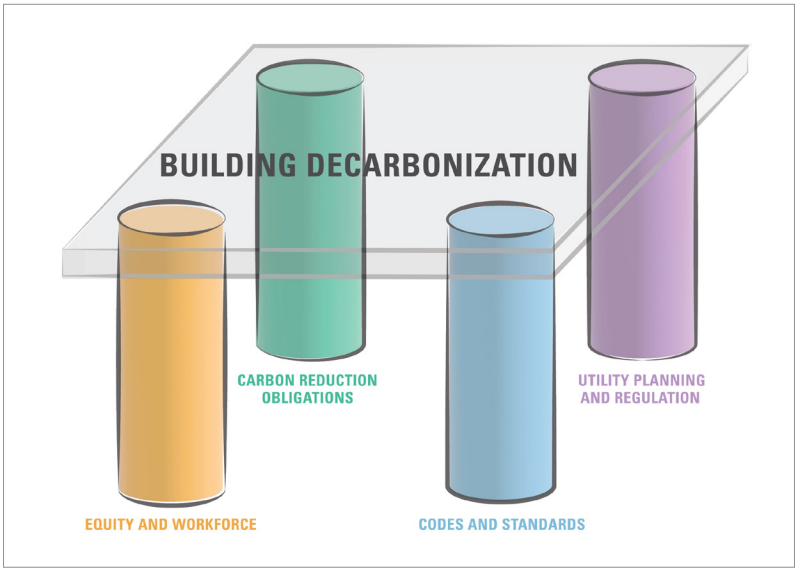
The current siloed approach to building decarbonization can undermine progress in several ways:

- **Missed targets**. Many states are finding that they are not on track to reach their climate and energy goals for 2030, 2040, and 2050 absent additional policies to tackle the building sector.
- **Insufficient and unpredictable funding.** Programs operating in silos may not be sufficient to unlock the funding needed to make necessary building upgrades, or the funding may come from inconsistent or unpredictable sources, leading to instability for market actors, building owners, and building occupants.
- **Lack of central coordination.** Most policies stem from different agencies and impact different market actors without central coordination or a mechanism to track overall progress. This can lead to insufficient coordination, overlapping programs, and gaps. Most policies stem from different agencies and impact different market actors without central coordination or a mechanism to track overall progress. This can lead to insufficient coordination, overlapping programs, and gaps in program delivery.
- **Persistent housing inequities and other discriminatory practices.** Policies designed to promote building decarbonization may not address the systemic disinvestment and lack of access that can prevent low-

income households and disadvantaged communities from benefiting from clean, affordable energy and healthy housing.

By contrast, a holistic policy approach can avoid these pitfalls. This document presents a holistic approach and aims to help states and stakeholders take coordinated action, across different venues and using a mix of policies, to equitably decarbonize buildings at the pace and scale needed to meet climate goals.

The Table



This brief presents a comprehensive policy framework for states to advance building decarbonization through setting a building decarbonization table. It describes four key policy areas, which can be thought of as legs of a table for effectively supporting building decarbonization: equity and workforce initiatives, carbon reduction obligations, codes and standards, and utility planning and regulation. Each of these legs includes a range of policy options, from mandatory programs to voluntary approaches and investments, and each can be adapted to fit states' specific goals and context. Ultimately, an approach that incorporates elements from each of these legs is most likely to provide a stable and effective foundation for lasting change.

- **Equity and workforce investments** address housing and workforce inequities by empowering historically marginalized communities and ensuring that the energy transition is just and inclusive.
- **Carbon reduction obligations** set performance requirements for obligated parties, such as energy providers, to reduce carbon emissions or install clean heating systems.
- **Codes and standards** establish a clear timetable for improving the energy performance of buildings and equipment, spurring changes in technologies and building practices.
- **Utility planning and regulation** sets mandates and frameworks to ensure that utility investment, rates, and programs align with building decarbonization goals.

State policymakers and other stakeholders can use this framework to assess a state's current building policies, identify gaps, and target opportunities to advance decarbonization and climate resilience while also tackling issues of housing inequity and access. While the brief focuses on state-level action, it is worth emphasizing that many of these policy options can be adapted and applied by cities, counties, air quality control districts, and other interested jurisdictions.

PART I—COMPONENTS OF THE TABLE

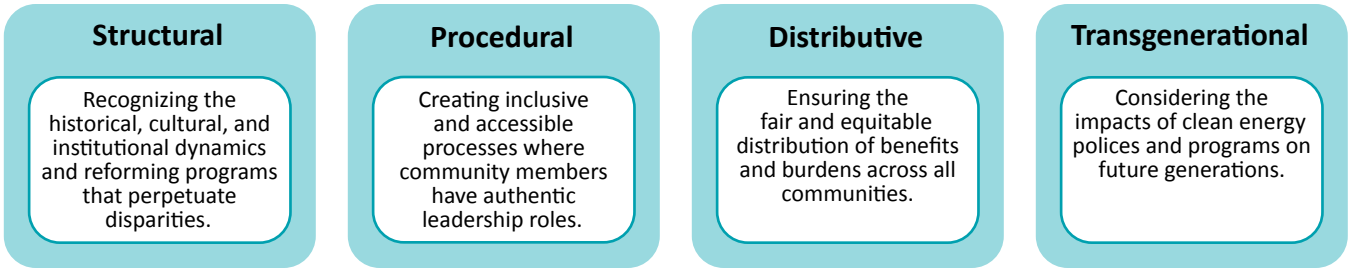
This section reviews the four sets of policies that states can enact to advance building decarbonization and describes how specific options within each set can be deployed to tackle distinct (and sometimes overlapping) issues. We do not attempt to rank or rate policies; rather what matters is that states pursue a comprehensive approach that includes policies from each category or leg. The optimal suite of policies will vary from state to state, depending on each state's priorities and goals, existing policies, constraints and resources, building stock and fuel mix, and other factors. Further, taking action across all legs of the table is a large undertaking and doesn't have to be done at once. States and stakeholders can strive to advance a few policies at a time according to their resources and priorities. The important thing is to take steps over time toward a comprehensive policy framework for building decarbonization.

Equity and workforce investments are the first leg of the table. Equity is the foundation for all efforts to decarbonize the building sector because buildings involve people: occupants, owners, and communities. Equity is also a cross-cutting consideration for policies in each of the other legs because different policy choices will impact low-income households and disadvantaged communities differently. For this reason, our review of policy options within each leg also includes a short discussion of opportunities to center equity.

Leg 1: Equity and Workforce Investments

To ensure that the energy transition is just, building decarbonization policies and programs must meet the needs of populations that have been historically underserved and underrepresented. Discriminatory practices have meant that these communities bear a disproportionate share of the environmental and cost burdens of the existing energy system: many communities of color have experienced a history of redlining and disinvestment and spend a larger share of income on energy bills than the average household. The same communities are also more exposed to the health risks associated with climate change and air pollution. These historic and ongoing injustices mean that decarbonization policies must be designed to deliver not only an equitable distribution of benefits but expanded access to the economic opportunities and new jobs created by clean energy investment.

Centering equity means that building decarbonization policies and programs must account for starting-line disparities by recognizing the harms of the past, incorporating voices from those who have been most burdened historically, and taking proactive approaches to ensure that the benefits of building decarbonization are accessible to every resident. This approach included both single and multifamily as multifamily housing residents, many of whom are renters, face the highest rates of energy insecurity in the country, and this disparity is even more pronounced in small multifamily buildings.



Policymakers should use the four pillars of energy equity—structural, procedural, distributive, and transgenerational—outlined in the graphic below to guide equitable building electrification efforts.

The menu of policy options available for addressing equity and workforce issues is extremely broad and includes a wide range of tools. The first two policies are process-focused and highlight practices to engage and empower communities and hold programs accountable for equity outcomes. The next two policies focus on funding and technical assistance to (1) help low- and middle-income (LMI) households upgrade their homes and (2) implement inclusive workforce programs that create pathways for new employees and grow local businesses. Together, these policies can advance building decarbonization in an equitable and inclusive manner, giving communities access to the economic opportunities and health benefits of the clean energy transition. Conversely, failure to prioritize equity would risk leaving whole communities out of the transition. As previously noted, because centering equity is critically important to the success of all other elements of a building decarbonization strategy, equity is also discussed as a cross-cutting consideration under each of the other "legs" in the building decarbonization table.

Policy Options

Community Empowerment

Community empowerment encompasses inclusive and accessible stakeholder engagement that empower members of historically marginalized communities to participate meaningfully in program design, implementation, and oversight. This means inviting communities to co-create solutions and decide what program success means. Tools such as the Community Engagement to Ownership Spectrum and RMI's Equitable Home Electrification Toolkit can help policymakers engage more effectively with communities, while also supporting communities' own efforts to meaningfully influence program design. Community empowerment can also involve providing stipends, technical assistance, and other services and resources that enable residents to participate meaningfully in program design and provide feedback.

Metrics and Goals

Metrics and goals are essential for equitable policies and programs as they serve to identify what success is and hold parties accountable to achieve that success. The right metrics provide accountability by identifying gaps, illuminating trends over

time, and measuring the progress and impact of programs. States can use different metrics to measure progress toward equity goals. Metrics based on spending or delivery of benefits ensure that investment and benefits flow to underserved communities. States have also leveraged metrics to track increased engagement and outreach and coordination with community-based organizations.

Home Upgrade Hubs

Home upgrade hubs provide enhanced incentives, financing, and technical assistance to help LMI homeowners and multifamily building owners make affordable improvements to their buildings. Implementing decarbonization measures can be expensive and complicated, and building owners may be deterred if they perceive large up-front costs, anticipate a large "hassle factor," or feel they lack the time and knowledge to engage with multiple contractors to install necessary upgrades.

To address these barriers, home upgrade hubs stack programs, funding, and other resources to maximize incentives and provide hands-on support for residents and building owners. Hubs, which can be housed in community organizations or with existing program implementers, leverage funding from multiple sources, including federal, state, and local programs, to provide free or highly subsidized retrofits. They also offer proactive technical assistance, energy audits, project management services, and access to certified contractors. By providing a single source of information, support, and services, home upgrade hubs can help consumers make a range of upgrades, from energy-efficiency improvements to heat pumps or solar panels. In Philadelphia, the Built to Last Program is an example of a one-stop shop that braids together funding to implement retrofits and present a seamless customer experience. The program provides participants with access to utility and repair programs, as well as legal and health and housing counseling services.

Some states are also using hubs to pool funding for health and safety improvements alongside energy-efficiency and electrification upgrades. Known as "healthy homes" or "pre-weatherization" programs, these initiatives aim to remediate issues that could cause a home or building to be deferred from the Weatherization Assistance Program (WAP) and other efficiency, electrification, and solar programs because the building's condition would render the upgrades unsafe or ineffective. State deferrals from WAP vary between subgrantees and are not always tracked, but studies have shown that deferral rates can be as high as 60 percent. To address this barrier, Connecticut recently launched a Residential Energy Preparation Services (REPS) program to address health and safety concerns in income-eligible homes.

Home upgrade hubs should address all types of housing occupied by LMI households, including single-family homes and multifamily buildings. Targeting the multifamily sector for building decarbonization is key to addressing historic inequities in housing. Multifamily housing residents face the highest rates of energy insecurity in the country, and this disparity is even more pronounced in small multifamily buildings (with two to four units). Further, these residents are likely to face barriers in accessing and participating in programs as they do not own the buildings or equipment. Retrofitting multifamily buildings entails several challenges unique to this type of building, from complicated heating, ventilation, and air conditioning (HVAC) systems to complexities associated with landlord-tenant relationships. Effective program designs for affordable multifamily housing address issues

like financing and incentives, technical assistance, collaboration among partners and stakeholders, and outreach. Studies have found that the most important component of a successful, affordable multifamily program is providing property owners and managers with technical assistance throughout the retrofit process. One-stop-shop home upgrade hubs can be an effective model to deliver comprehensive support to building owners.

Inclusive Workforce Development

Building decarbonization will create significant economic development opportunities. The building decarbonization workforce encompasses a range of professions, from installers and builders to HVAC technicians and energy auditors, all of which will need to grow significantly. The current energy-efficiency workforce is neither diverse nor representative of the population that it serves. This presents an opportunity to address historic inequities by opening new pathways to enter the field.

To design programs that deliver benefits to underserved communities, states will need to consider ways to support trainees through wraparound services, paid on-the-job training, and partnerships with trusted local groups. States, in partnership with contractors, trade schools, labor groups and unions, and community colleges, can establish or expand programs to train and certify workers in the delivery of weatherization and electrification services and equipment installation. These programs can include targeted outreach to current contractors through distributors or other local networks. Prioritizing local hires can make the workforce more reflective of the demographics of the region and ensure that more of the wealth and economic growth generated by clean energy investment is returned to local communities.

For example, the District of Columbia's Sustainable Energy Utility has a specific focus on workforce development, connecting residents to externship opportunities with local contractors, businesses, municipal agencies, and other organizations engaged in the clean energy transition. These externships, which are open to people with all levels of experience, have achieved an 85-percent placement rate in full-time positions.

Metrics and goals can also be used to advance equity and diversity in building-related professions. By tracking progress, states can ensure that energy-efficiency and electrification workforce programs lift underserved communities and expand access to desirable skills and well-paying jobs. For example, if projects value "local hires," the clean energy workforce will be more likely to reflect the demographics of the region and more of the wealth and economic growth generated by clean energy industries will be returned to local communities.

Leg 2: Carbon Reduction Obligations

The next leg of the table encompasses carbon reduction obligations—both carbon emission caps and clean heat standards. These policies require obligated parties—fuel suppliers, electric and gas utilities, and other carbon-emitting sectors or industrial facilities—to reduce GHG emissions or provide clean heat services. With the right safeguards to promote equitable implementation, they can ensure that energy providers help pay for decarbonization investments (including in buildings), encourage obligated parties to change their business models, and create sustained, long-term incentives that unlock resources for the clean energy transition.

The level of carbon reduction required under a cap or clean heat standard is typically determined by a state's clean energy or climate plan and designed to scale over time. But these types of policies, unlike a technology requirement, do not dictate how carbon reductions are to be achieved. Businesses and consumers can pursue a variety of strategies and make different compliance choices. This flexibility also means, however, that additional policies may be needed to ensure that market investments and long-term outcomes align with other state goals.

Policy Options

Cap-and-Invest

Cap-and-invest policies set a cap on carbon emissions from fuel suppliers, large building owners, gas utilities, electric utilities, or other major carbon-emitting industries or entities. Companies included under the cap must obtain permits or allowances to ensure emissions stay within the cap. Cap-and-invest policies differ from traditional cap-and-trade policies because they use funds generated from the auction or sale of allowances to invest in emissions reduction initiatives. Such initiatives can include building decarbonization programs. For example, the northeastern states' Regional Greenhouse Gas Initiative (RGGI) caps electric utility carbon emissions. RGGI allowances are auctioned, and the proceeds are frequently used by states to fund energy-efficiency programs, including programs that target customers who rely on unregulated fuels such as oil and propane and thus may not have access to utility efficiency programs. California, Oregon, and Washington have also implemented statewide cap-and-invest programs.

Cap-and-invest policies can be an effective tool for reducing statewide GHG emissions, but they must be well-designed. For example, identifying which parties should properly be included under the cap and ensuring that cap levels align with state climate goals are key to achieving desired impacts.[1] A cap-and-invest program that focuses only on larger point-source emitters such as power plants and industrial facilities will not deliver direct emission reductions from the building sector, where point sources, individually, are small and highly dispersed. To address the buildings sector, it would be necessary to apply the allowance obligation to providers of heating fuels (i.e., gas utilities as well as suppliers of oil, propane, and other fossil fuels) at the wholesale level. Even if electricity and heating fuels are covered by a cap, a carbon cap alone will probably not be sufficient to drive building sector decarbonization. There are numerous well-documented barriers to change in the building sector, and demand for energy in buildings is often slow to respond to changes in fuel prices. This means that a cap-and-invest program is likely to be most effective in advancing building decarbonization if a portion of auction revenues is specifically used to fund incentives and other assistance for building upgrades. In Delaware, the Pre-Weatherization Program uses RGGI funds to provide structural repairs—at no expense to homeowners—prior to weatherizing a home.

[1] For example, RGGI did not reduce emissions as much as desired in the early years of implementation because the initial cap was set high. In subsequent program updates the cap has been tightened significantly and other mechanisms were added to slow the release of allowances if the allowance price was too low.

Clean Heat Standards

Clean heat standards (CHS) can be applied to regulated gas utilities and unregulated fuel suppliers, known as obligated parties. Analogous to energy efficiency resource standards (EERS) and renewable portfolio standards (RPS) for regulated utilities, a CHS requires obligated parties to deliver clean heat measures that reduce GHG emissions from heating buildings. The point of a CHS is not to reduce fossil fuel consumption by increasing fossil fuel prices; rather, the aim is to ensure that programs to promote building efficiency, clean heating systems, and cleaner heating fuels are physically delivered at the level of individual buildings. Similarly, renewable portfolio standards seek to change the power mix not by raising the price of electricity generation from fossil fuels, but by requiring renewables to account for an increasing share of the total electricity delivered to end-use customers.

CHS can generate funding for clean heat measures while also encouraging fossil fuel suppliers such as oil dealers and gas utilities to transition their business models. To meet their CHS requirements, obligated parties must assemble and deliver a gradually increasing number of clean heat credits, which are earned by delivering verified clean heat measures in buildings within the state. Each state can determine the types of clean heat measures that are eligible under the program. Options include weatherization, heat pumps, qualified renewable low-carbon fuels, and geothermal and solar thermal heating systems.[2] Obligated parties can generate their own clean heat credits by delivering eligible measures to end-use locations; alternatively, they can purchase credits from a qualified third party, such as an HVAC contractor who installs heat pumps or a provider of zero-carbon renewable fuels. For example, Colorado's CHS establishes targets for gas utilities to reduce emissions 22 percent by 2030, relative to a 2015 baseline. To achieve these reductions, Colorado gas utilities can choose from a range of clean heat and decarbonization options, including electrification, weatherization and efficiency programs, and green hydrogen. Maryland, Massachusetts, and Vermont are also currently developing CHS regulations.

Key elements of program design for a successful clean heat standard are:

- Setting the pace of change required (this will most likely be determined by the state's GHG reduction goals for the buildings sector);
- Determining which energy providers will be obligated;
- Selecting which investments and fuels will qualify for clean heat credits and how credits will be measured (e.g., in tons of GHGs avoided, by numbers of heat pumps installed, etc.);[3]
- Setting rules to support equity and affordability, especially solutions to lower bills and improve housing quality for LMI households;
- Deciding whether and how to account for the lifecycle GHG impacts of biofuels, renewable fuels, and other alternative fuels like hydrogen; and
- Designing the program so that it supports and meshes with the state's other building sector programs, including energy efficiency programs, equipment standards, and building codes.

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[2] In the Northeast, states are developing rules for earning clean heat credits. Vermont's Clean Heat Standard covers all fossil-fuel heat providers, including Vermont Gas and delivered fuel dealers in proportion to their fossil fuel sales. In Massachusetts' program, obligated parties might include electric utilities as well as fossil fuel suppliers.

[3] Massachusetts is considering two types of credits as part of the implementation of its clean heat standard. The first is a "full electrification credit" that is designed to encourage residential building electrification; the second is an emission reduction credit for operating electric heat pumps or delivering certain types of biofuels.

Centering Equity in Carbon Reduction Obligations

Historically, environmental justice advocates have sometimes objected to cap-and-invest programs because of the concern that regulated companies can buy allowances and continue emitting, even when their activities cause disproportionate harm to low-income communities. Another concern is that these programs can have regressive distributional impacts if energy suppliers pass through the costs of buying allowances by raising prices on consumers. To ensure that carbon reduction obligations are implemented equitably, states can create guardrails to ensure that obligated entities invest in reducing emissions on-site or in local communities, rather than simply buying credits generated in higher-income areas, or outside the state. To address concerns about cost impacts on low-income households, states can mandate investments in disadvantaged communities or groups, for example by directing a portion of allowance revenues to these communities or groups and/or by creating program carve-outs to drive installation of clean heat measures in targeted areas or among targeted participants. Another option is to allocate a portion of auction revenues to be distributed directly back to households in a progressive manner, as a way to mitigate potential consumer cost impacts and to deliver maximum benefits to low-income households. New York state's Climate Affordability Study, released in December 2023, discusses these options.

States should also consider establishing advisory councils and tracking the equity impacts of carbon reduction obligations, for example by documenting how much funding or how many clean heat installations go to LMI households. For example, Vermont's CHS legislation established an Equity Advisory Group to advise on rule design, recommend strategies to equitably serve LMI residents, and identify gaps in funding, programs, or incentives.

Leg 3: Codes and Standards

Policies in this leg establish firm timelines for bringing improvements to market and provide clear regulatory signals that spur changes in technologies and building practices. Mandatory policies such as building codes, building performance standards, and emissions or efficiency standards for equipment and appliances require building owners, builders, or manufacturers to meet a certain level of building or technology performance. Codes, building performance standards, and appliance and equipment standards each set requirements for different intervention points in the lifecycle of a building. Codes set standards on new construction or major retrofits, while building performance standards apply to existing buildings and require buildings not in compliance to make energy upgrades by a certain future date. Appliance efficiency standards set a baseline for the energy performance of products at the point of manufacture, while emissions standards typically apply to building equipment sold or installed after a certain date; both types of policies ensure that when appliances reach the end of their lifetime, they are replaced with new products that meet stricter requirements for efficiency or emissions.

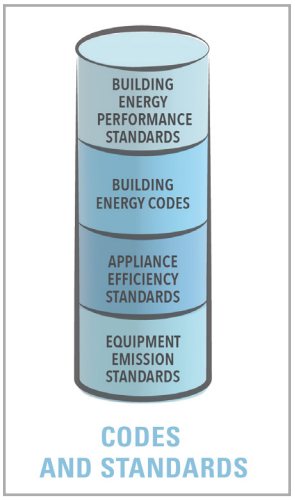
Well-designed codes and standards provide significant lead time so that manufacturers and builders can prepare and adjust (for example, by changing product lines and training contractors) and so consumers can become educated about new requirements and product offerings. At a high level, these standards provide regulatory

certainty, which benefits manufacturers by setting predictable expectations for how and when product performance must improve, enabling them to make timely investment decisions. A joint vision statement from the Building Decarbonization Coalition (signed by 10 major heat pump manufacturers) states: "Regulation is essential. The marketplace will not scale without clear regulatory requirements—not just incentives." Regulatory certainty is also valuable for other stakeholders, such as grid operators and utilities, who must plan for future energy system needs.

Policy Options

Building Energy Performance Standards

Building energy performance standards (BEPS)—or, in some cases, building emissions performance standards—require that existing buildings, as a whole, achieve a defined level of energy or emissions performance. BEPS policies usually apply to large commercial, institutional, and multifamily buildings, rather than single-family homes. Many BEPS policies build on benchmarking programs that mandate disclosure of energy usage. BEPs require owners of buildings that don't meet the whole-building energy or emissions standard to take steps to improve building performance, usually by investing in energy-efficiency and electrification measures. Compliance requirements can be triggered annually, at a future date, or at a natural point in a building's lifecycle (e.g., at time of sale or major renovation), and failure to comply with the standards can result in penalties. BEPS can be designed to increase in stringency over time or to apply to a larger fraction of the building stock over time, to align with overarching energy and climate goals. To date, most BEPS policies in the U.S. have been enacted by large cities, but states are also advancing BEPS policies. Thus far, Maryland, Oregon, and Washington have passed BEPS on a statewide basis.



Building Energy Codes

Energy codes set minimum requirements for specific building systems or structural elements, such as plumbing and HVAC systems or building envelope design and insulation, and typically apply to new construction, additions, and major renovations. Building energy codes have been in wide use for a long time and are thus familiar to state policymakers and the building industry. National model energy codes are published every three years, and most code adoption occurs at the state level. Most states and some local governments have the authority to enact more stringent building codes than the national model codes, as well as optional "stretch codes" that promote high-performance new construction. More recently, some jurisdictions have begun exploring how energy codes can be used to advance climate resiliency and accelerate decarbonization. In Massachusetts, the Climate Act of 2021 required development of a new Municipal Opt-In Specialized Code formulated to ensure new construction is consistent with the state's GHG reduction goal. It is optional for municipalities to adopt the Specialized Code, but once adopted it is mandatory for new buildings constructed in the municipality to comply. With proper support for the building design and construction industries, climate-friendly building energy codes can standardize practices and save energy and costs for building owners.

Appliance Efficiency Standards

While most appliance and equipment efficiency standards are set at the national level to provide consistency for manufacturers, states can set efficiency standards for products for which there are no existing federal standards. While this limits the scope for state action, several states have set efficiency standards for products like showerheads and water coolers.

Equipment Emission Standards

Under state environmental statutes and the federal Clean Air Act, states can establish regulations to limit pollution from equipment used in buildings. As states make progress in curbing emissions from other sectors, the building sector's relative contribution to overall air pollution is increasing. Recent analyses have found that gas equipment in buildings is now a larger source of nitrogen oxide (NOx) emissions than gas power plants nationally. Equipment emission standards are an emerging policy option to address emissions from buildings while also setting a clear signal that fossil fuels will be phased out of buildings over time.

States can set standards limiting conventional air pollutant or GHG emissions from HVAC and water heating equipment—the major end uses in buildings that contribute to outdoor air pollution—after a certain date. An equipment emission standard does not require early replacement of functioning equipment, but it can ensure that, at the time of replacement, polluting equipment is replaced with zero-emission alternatives, such as heat pumps. This advances decarbonization goals and can help states comply with National Ambient Air Quality Standards for pollutants like NOx, a key ingredient in the formation of ozone smog and fine particulate matter. The Bay Area Air Quality Management District (BAAQMD) in California recently became the first jurisdiction in the nation to promulgate zero-NOx standards for furnaces and water heaters, and California and Maryland are currently developing similar statewide policies.

Centering Equity in Codes and Standards

Zero-emission, high-performance buildings and equipment will be healthier for occupants in the long run and can often be cost-competitive with less efficient options in new construction. However, policies like BEPS and equipment emission standards that affect existing buildings may require investments in equipment that might have a higher upfront cost or, with building performance standards, result in financial penalties when not followed. Therefore, they should be accompanied by complementary programs that offer financial and technical assistance to help building owners make the transition. For instance, states may need to implement dedicated programs to support small businesses and owners of affordable housing to access financing and navigate other barriers to BEPS compliance, such as the Washington, D.C. Affordable Housing Retrofit Accelerator dicussed in the next part of the paper.

It is also important to educate building owners, builders, appliance manufacturers, and others subject to codes and standards about upcoming requirements, so they can plan ahead. This can also help policymakers identify gaps where additional support is needed. For example, BAAQMD established an implementation working group for its zero-emission standards to advise on affordability and market readiness, with a specific focus on LMI households and small businesses. This represents a significant investment of time and resources; other agencies can consider similar approaches.

Leg 4: Utility Planning and Regulation

This leg encompasses changes to utility business structures, planning, and regulation. Because the energy needs of the existing building stock are today being met by a combination of electricity and fossil fuels (primarily pipeline gas[4] but also, in some regions, propane and heating oil), building decarbonization requires action at the level of the power grid and at the level of individual structures. Utilities and utility regulators have a critical role to play in developing and operating a flexible and resilient grid that reliably delivers clean electricity at competitive prices. Regulators and grid operators can work with utilities to align energy-efficiency programs, resource portfolios, distribution network planning, and long-term pipeline and transmission system planning with states' climate commitments.

This leg of the table encompasses a range of policy options to accomplish distinct goals within the utility regulatory space, many of which are crucial to unlock funding for building decarbonization. Reforming existing programs and developing new programs to better align with climate goals may require modifying the methods used to measure success in energy-efficiency investments, as well as changes in how utilities recover program costs. Proactive planning is needed to ensure the electric grid can support the level of electrification and demand flexibility required to support the clean energy transition. Electric and gas utility rate structures can be modified to make building electrification affordable and equitable for residential and commercial customers; rate design can also send important signals to reduce energy waste and shift load to enable more efficient grid operation. Meanwhile, gas utilities may need to revise their depreciation schedules and capital plans to support the transition to a low-emissions future. Other policies such as energy efficiency resource standards (EERS), renewable portfolio standards (RPS), clean peak standards, and performance-based regulation can be introduced or expanded to better align utility investments with climate goals.

Policy Options

Climate-Forward Energy-Efficiency Programs

Early energy-efficiency programs were designed to reduce energy consumption and lower energy bills. Newer generations of these programs, drawing on the extensive experience of utilities and program implementers, can evolve to focus on achieving carbon reductions alongside energy savings, in alignment with state climate goals. Initial steps could include making new fossil fuel equipment ineligible for program incentives and promoting fuel-switching away from fossil fuels. Regulators can embrace a climate-forward approach to energy efficiency by requiring utilities and administrators of other regulated programs[5] to expand core program goals to

[4] This brief uses the term "pipeline gas" instead of natural gas.

[5] Efficiency Vermont and Focus on Energy are examples of regulated, non-utility program administrators.

include GHG reductions as well as energy savings, increasing support for electrification measures, and aligning program targets with state climate goals. For example, California recently adopted a "Total System Benefit" (TSB) metric to set goals for the energy-efficiency portfolios of the state's investor-owned utilities and other program administrators. The TSB combines the benefits of long-term energy savings, reductions in peak load, and lowering of GHG emissions into a single, fuel-agnostic metric (in dollars).

Clean Heat and Building Decarbonization Programs

Beyond adding a climate focus to existing efficiency programs, regulators can require utilities and program administrators to establish new initiatives, with dedicated funding, that offer incentives, financing, and technical assistance for building decarbonization and clean heat. Many utilities and program administrators have extensive experience delivering energy-efficiency programs and can play a role in implementing electrification initiatives, such as incentive programs for heat pumps. States can also set up new programs run by third-party administrators; TECH Clean California and Clean Heat Rhode Island are examples of statewide clean heat initiatives that are not run by utilities.

In the case of gas utilities, alternative investment and business models and changes in regulation may be needed to ensure that non-gas-based heating solutions, such as heat pumps or networked geothermal or a full transition to efficient electrification, are offered and encouraged. Vermont Gas Systems, for example, has developed an electric water-heating program where the company installs and then services heat pump water heaters for customers. States can also adopt a CHS for gas utilities, as discussed in our review of policies in the "Carbon Reduction Obligations" leg, or establish analogous performance requirements with the aim of eventually transitioning to a new business model for regulated utilities that aligns better with climate goals.

Long-Term Planning for Electric and Gas Utilities

Utility business models and long-term plans should align with state climate goals. For electric utilities, this means shifting from a focus on dispatching power plants to meet demand, to managing demand to allow for efficient, reliable operation of a grid dominated by variable renewable energy generation. One way that utilities can do this is by leveraging a system of interconnected dispersed and dispatchable distributed energy resources (such as batteries, EVs, and other connected devices) that act as virtual power plants. To encourage new business models and approaches to grid operation, state regulators can require electric utilities to develop long-term plans for electrification and virtual power plants. This planning should be coupled with policies that empower communities to be a part of, and have a say in, the evolution of the power grid and the distribution of generation resources on that grid. Going a step further, states can consider performance-based regulation to create incentives for utilities to achieve environmental, equity, and energy goals. Utility regulators can also increase RPS requirements to match the pace of state climate commitments.

For gas utilities, transition planning is key to develop business models that will be viable in the long term and avoid stranded assets. Electrification will likely reduce gas sales, which will cause gas rates to rise and make it challenging to raise the revenues needed to maintain a safe and reliable distribution network. Without proactive planning, a reduction in demand could mean that a shrinking number of customers (including those who cannot afford electrification) will be left to bear the costs of a smaller gas system. With proactive planning,

states can identify opportunities to reduce the size of the gas network strategically, repurpose the network for other uses, and better manage system costs by revising gas utility rate structures, depreciation schedules, and capital plans. One opportunity that is drawing increased attention involves thermal energy networks, in which multiple buildings are connected, usually via underground pipes that circulate water, to a common heat source. Such networks offer a potentially efficient and cost-effective way to capture and distribute waste heat (for example from industrial sources or data centers) or from clean geothermal sources. At the same time, thermal energy networks may allow gas utilities to productively deploy their existing infrastructure in a climate-aligned way. Currently, six states (Colorado, Maryland, Massachusetts, Minnesota, New York, and Washington) have legislation that allows or mandates utilities to develop thermal energy network demonstration projects or pilots.

Finally, there may be opportunities for gas and electric utilities to work together to reduce total system costs and optimize infrastructure investments. Building electrification may help to defer or avoid the need for costly new gas pipelines, for example. State regulators will have a role to play in capturing these kinds of synergies, promoting holistic approaches to long-term infrastructure planning, and ensuring that utility business models evolve to meet the challenges of building decarbonization.

Rate Design

Electric utility rate design offers some of the best opportunities to directly encourage electrification in both the buildings and transportation sectors while also advancing equity and climate goals. Over time, electrification will increase demand for electricity and, if large system investments have to be made to handle larger loads and integrate renewable generation, the result could be upward pressure on rates. However, if electric rates are too high, electrification will be less affordable in the near term and customer adoption of technologies like heat pumps could be impeded.

Some public utility commissions have already begun exploring strategies for using rate design to accelerate electrification while also reducing costs to consumers. For example, states are testing programs that cap electric rates for building owners who install heat pumps or programs that adjust electric rates based on time of year. In Maine, utilities are working with regulators and advocates to design rates to deter energy usage during peak demand periods and reduce costs of electrification. For example, Versant Power currently offers customers an "Eco Rate" that provides a lower rate to encourage customers to use electricity during periods of lower demand. The rate applies if the home has a heat pump and/or heat pump water heater and if these devices account for at least 50 percent of the home's electricity use.

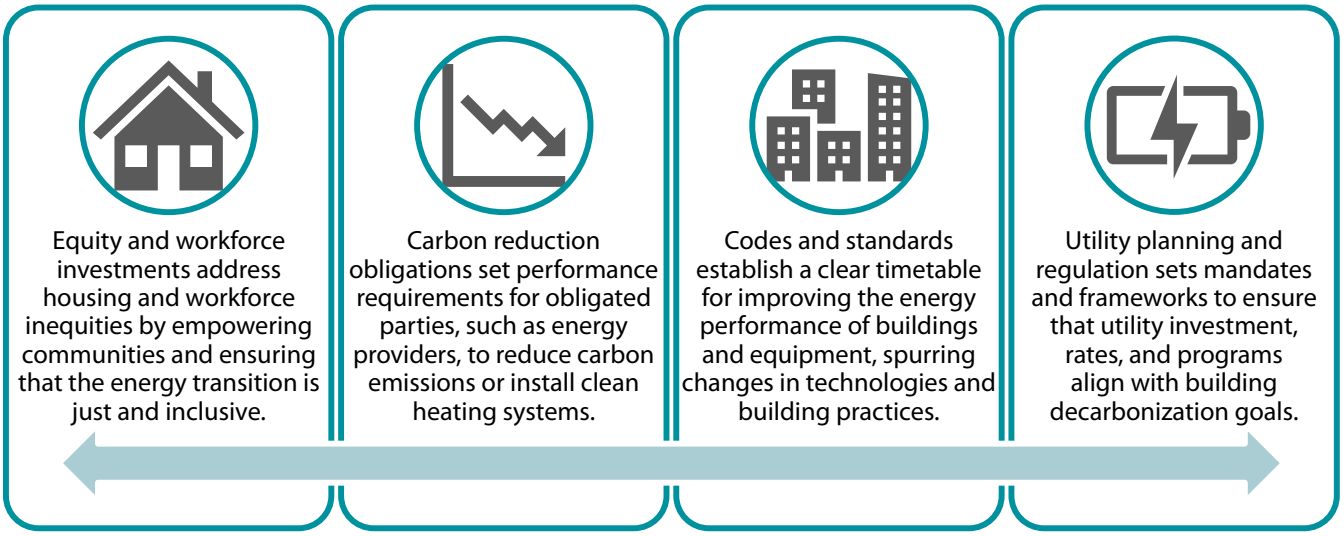
Additionally, regulators can adopt rate structures that are designed to alleviate cost burdens for lower-income customers, such as percentage of income payment programs (PIPPs). The state of Colorado has a PIPP that caps total energy burden, whether a customer is electric or dual-fuel, as a way to ensure that electrification doesn't increase low-income participants' bills. Meanwhile, time-of-use rates can help to incentivize lower customer usage during high-demand times and allow utilities to rely more on demand response and distributed energy resources to manage peak loads rather than investing in additional generating capacity. In these ways, thoughtful rate design, undertaken with care to ensure alignment with state climate goals, can encourage customers to electrify while alleviating concerns that doing so will increase their overall energy costs.

Centering Equity in Utility Planning and Regulation

In addition to rate designs that reduce energy burden for low-income customers, equity-focused metrics and tracking for utility programs can drive program implementers to design programs that are inclusive and responsive to barriers in low-income communities. Metrics might include income level and geographic distribution of homes served, number of participants, single- or multifamily homes, and energy burden of customers served before and after enrollment. In Vermont, Green Mountain Power measures the societal benefits of deploying advanced metering infrastructure (AMI) using metrics like commercial and industrial outage cost reduction, decreased energy costs, and energy conservation connected to AMI-based web portals. Equity metrics can also be established and tracked at the enterprise level through performance-based regulation. Another alternative is to consider portfolio segmentation, in California, the Public Utilities Commission (CPUC) divided its energy-efficiency portfolio into three segments: resource acquisition, market support, and equity. The CPUC took this approach because it was having difficulty assigning value to the types of benefits—in areas such as public health, economic opportunity, and housing quality—that result from equity-focused initiatives. The CPUC also found that focusing on cost-effectiveness as a decision metric resulted in administrators prioritizing cost-effectiveness over other state policy objectives like equity, market transformation, and strategic electrification. Segmentation can provide increased accountability since progress is assessed for each sub-portfolio of programs.

PART II—SETTING THE TABLE FOR STATE ACTION

The first part of this brief focused on the four legs of the building decarbonization table, describing a variety of policy options within each leg. An individual state's choices about which policies to prioritize will vary depending on past experiences, goals, existing programs, and the marketplace, but the aim should be to enact a comprehensive suite of policies across all four legs.



This section offers a set of design principles to ensure that individual policies are effective and work together in an integrated fashion. It also provides examples of the portfolio approaches taken by several states that have already adopted policies on building decarbonization.

Policy Design Principles

Promote cohesive, coordinated policies across agencies

Building decarbonization policies can straddle state agencies and regulatory entities with different but overlapping authorities. For example, public utility commissions regulate utility rates and electric and gas system planning, while environmental agencies regulate air pollution from building equipment. Policymaking in certain areas, like clean heat standards, may span energy and environmental agencies. Other programs, like those that serve low-income households and multifamily buildings, often involve housing and social services agencies. States will need to consider the goals of the policy or program, the entities being targeted, and the roles different agencies play to create a cohesive strategy with clear delineation of agency responsibilities. Some states are addressing this by establishing climate offices with cross-cutting responsibility to coordinate agency activities as part of a "whole of government" approach. In Massachusetts, the Office of Climate Innovation and Resilience was established by executive order to advance the state's climate innovation, mitigation, adaptation, and

resilience policies. In addition to creating a new cabinet-level Climate Chief, each Cabinet Secretary is required to appoint a Climate Officer responsible for implementing climate-related efforts within their agency.

Balance incentive-based and standard-based policies

To create certainty about outcomes while providing flexibility for the transition, states will need to combine policies that rely on incentives and voluntary actions, such as utility energy-efficiency programs, with policies that send clear regulatory signals, such as energy codes and zero-emission equipment standards. Some policies, like clean heat standards, can include voluntary and mandatory elements: a CHS can require covered entities to achieve a set reduction in emissions, but give them flexibility in how they meet the requirement. An integrated approach to incentive- and standard-based policies will provide space for the marketplace to find innovative solutions while ensuring steady progress toward a long-term goal of equitable building decarbonization.

Work toward a seamless marketplace experience

As states enact different policies, it will be important to consider how various requirements and incentives affect customers and market actors, such as building owners, contractors, wholesale distributors, and retailers. Policy design and implementation can be coordinated to provide a more streamlined experience and avoid duplicative administrative steps. For example, building owners who are subject to a building performance standard might be able to access incentives from both a clean heat standard-funded program and a utility efficiency program, which could be combined behind the scenes so that owners only need to submit one application. Building owners could also benefit from a one-stop shop for learning about performance requirements, accessing incentives, and finding qualified contractors. Building owners who are located in states with a zero-emissions standard for new HVAC installations will need to select equipment that meets this standard.

Track results and GHG impacts across programs

As states enact multiple building decarbonization policies, it will be important to set clear goals for all programs and develop a robust system of accountability and reporting so that policies and programs can be adjusted over time. States should establish a framework for monitoring progress toward climate and energy goals that helps them understand the collective impact of their efforts, as well as the contribution of individual policies and programs to GHG emission reductions. Robust tracking and reporting will enable states to monitor their progress toward statewide decarbonization goals and scale up the most effective policies and programs.

Examples of Coordinated State Policy Approaches

This section walks through several real-world examples that illustrate how different types of policies can work together to tackle the complex challenge of building decarbonization. The examples are not intended to provide an exhaustive review of every building decarbonization policy in the states discussed—rather, they aim to illuminate relationships between featured policies and show how policy coordination can fill gaps and accelerate progress.

CALIFORNIA:
Cap and Invest + Utility Planning and Regulation + Equity and Workforce Investments

California's cap-and-invest program is a key element of the state's strategy to reduce GHG emissions, as mandated by the California Global Warming Solutions Act of 2006. The program is governed by regulations from the California Air Resources Board (CARB) and covers 85 percent of the state's total GHG emissions. It regulates about 450 entities, including electricity generators, large industrial facilities, and fuel distributors who deliver gasoline and other transportation fuels, pipeline gas, and propane. Collectively, these entities are subject to a declining cap on GHG emissions. Every year, fewer allowances are issued consistent with the state's objectives for reducing overall emissions. CARB develops rules for the issuance and trade of allowances among regulated entities.

Revenues generated by auctioning allowances go into the state's Greenhouse Gas Reduction Fund and are appropriated to state agencies to implement programs that further reduce GHG emissions. More than a third of these revenues are directed to environmentally disadvantaged and low-income communities. One of the initiatives funded through this mechanism is TECH Clean California. TECH is a statewide market transformation program to increase the adoption of air-source heat pumps and heat pump water heaters by California consumers and contractors. TECH offers incentives, financing, and workforce training for heat pumps. It also educates residents by providing a single statewide platform for contractors and consumers to access information about clean energy technologies. Sales and electric and gas meter data from TECH installations is being used to create a public database that can inform the future development of equitable, transformative long-term policy frameworks for building decarbonization. Rigorous data collection and program evaluation provide insights into what works and help to identify implementation issues and opportunities for program improvement.

KEY TAKEAWAYS:

- In addition to providing certainty about future emissions, broad-based carbon reduction standards like California's cap-and-invest program create a sustainable funding stream through the sale of allowances or by levying a charge on emitters. This funding stream can be used to support other statewide programs that invest in market transformation, workforce training, and equity.
- Broad-based policies like cap-and-invest may not be sufficient to drive the change needed in specific market segments like the buildings sector. The cost of allowance purchases by regulated entities like gas utilities usually translates to a fairly small increase in fuel prices and is generally not enough to spur action by building owners. Programs like TECH Clean California, which is funded by revenue from the state's cap-and-invest program, fill a critical gap by directly incentivizing consumers and contractors to install energy-saving, zero-emissions equipment like heat pumps.

MARYLAND:
Building Energy Performance Standards + Clean Heat Standards + Equipment Emission Standards

In 2022, the Maryland legislature passed the Climate Solutions Now Act, which set new climate goals for the state. These goals include reducing GHG emissions 60 percent by 2031 and achieving net-zero GHG emissions by 2045. To reach the 2031 goal, building sector emissions will have to decline 6 percent per year on average between 2024 and 2031. In support of this goal, the legislation also established statewide BEPS. Maryland's BEPS require large commercial and multifamily buildings (35,000 square feet or more) to reduce their GHG emissions 20 percent by 2030 and become net zero by 2040. The standards are expected to reduce peak electricity demand in covered buildings 6 percent by 2040.

In June 2023, Maryland issued a report, Maryland's Climate Pathway, which analyzed a variety of actions the state can take to reach its GHG reduction goals. This was followed, in December 2023, by the release of Maryland's Climate Pollution Reduction Plan, which proposes additional strategies to achieve a 60 percent reduction in GHG emissions by 2031. A clean heat standard (CHS) and zero-emission heating equipment standard (ZEHES) are two of the strategies included in the plan. The CHS will establish targets for obligated parties (most likely gas utilities and other fossil fuel providers) to reduce the use of fossil fuels in homes and businesses by a set percentage each year. Installation of clean heat options will generate credits that can be applied toward the annual obligation, whether the installation is completed by the fuel provider or by other parties eligible to earn credits. The ZEHES will require that any heating systems installed after a certain date have zero on-site emissions; these newer systems will continue to be eligible to generate clean heat credits.

Maryland is currently developing regulations for all three of these policies as part of a comprehensive building decarbonization strategy. The state's BEPS regulation has been drafted and will be adopted in 2024. CHS and ZEHES regulations are under development and could be adopted in 2025.

KEY TAKEAWAYS:

- Maryland is pursuing CHS and BPS in part to spur near-term building retrofits, helping the state to meet its 2031 GHG reduction goals. Both CHS and BPS can prompt early replacements of equipment and other building upgrades to meet the standards. This contrasts with ZEHES, which likely phase in around 2030 and will apply only to equipment being replaced at the end of its useful life or in new construction buildings.
- ZEHES provides regulatory certainty for manufacturers, distributors, and installers of heating and hot water equipment, so they can plan for the pace and scale of the transition to zero-emission heating. ZEHES also fills a policy gap in Maryland by addressing emissions from equipment installed in smaller buildings that are not subject to BEPS and by preventing new installations of long-lived equipment that would still be operating after 2045, when the state's goal is to reach net-zero GHG emissions.
- Maryland's CHS for fuel suppliers aligns with the "polluter pays" principle, ensuring that gas utilities and unregulated fuel suppliers that contribute to GHG and air pollutant emissions are responsible for a fair share of emission reductions. This can prevent overreliance on electric ratepayers for funding the clean energy transition and mitigate upward pressure on electricity rates.

MASSACHUSETTS:
Clean Heat Standard + Utility Planning and Regulation + Equity and Workforce Investments

As of February 2024, Massachusetts is developing a clean heat standard and modifying its utility regulatory framework under new orders issued by the state's Department of Public Utilities (DPU). These policies build on previous workforce and equity initiatives and the state's robust utility energy-efficiency programs through Mass Save. In December 2023, the Massachusetts DPU issued an order announcing a new regulatory structure for gas utilities in the state. The strategy is meant to reflect the state's GHG reduction goals and better align gas utilities' business models and investment decisions with the state's approach to climate mitigation. In the order, the DPU orders gas distribution utilities to consider non-gas alternatives when asking the DPU to approve capacity expansion projects. The utilities will also be required to file Climate Compliance Plans every five years.

In January 2024, the DPU also ordered a study of energy burden and affordability programs in an effort to ease the impact of higher electricity costs on residents and businesses in the transition to decarbonized energy systems. As part of this proceeding, regulators will look at options for reducing energy costs for lower-income residents, such as changing eligibility requirements for energy assistance programs and tying utility costs to household income, as several other states do through percentage of income payment plans (PIPPs).

Massachusetts is also designing a CHS to reduce GHG emissions and promote the electrification of building heating systems. Under a draft program framework released in 2023, the CHS will apply to regulated electric and gas utilities, as well as oil and propane suppliers. It will require annual emission reductions, which can be achieved by measures such as switching to low-carbon fuels or investing in "full electrification" building conversions. The draft program framework also includes a low-income carve-out and a just transition fee to support equitable implementation.

In addition to these utility reform and CHS efforts, other initiatives in Massachusetts aim to address workforce issues and enhance equity through a focus on affordable housing. The Massachusetts Clean Energy Center (MassCEC) is developing workforce programs to increase access to energy careers, education, and training¾as a way to advance equity goals and to fill critical needs for workers to support the clean energy transition. To address affordable housing and financing challenges, Massachusetts governor Maura Healey, in July 2023, announced the creation of the nation's first green bank dedicated to affordable housing. The new Massachusetts Community Climate Bank will be seeded with $50 million in funds from the state's Department of Environmental Protection. The Bank is charged with maximizing GHG reductions from the building sector in ways that benefit low-income communities and help address the state's shortage of affordable housing.

KEY TAKEAWAYS:

- Changes to the utility regulatory framework are a crucial enabling step but may not prompt the level of investment needed to decarbonize the buildings sector at the pace required to achieve state climate goals, even in a state with well-funded energy-efficiency programs like Mass Save. CHS will generate additional funding and installation of clean heat appliances, but must be well-coordinated with existing Mass Save programs and incentives.

- CHS fill a critical gap in regulation by imposing requirements on suppliers of unregulated, delivered fuels like oil and propane, which provide energy for home heating for nearly 30 percent of households in Massachusetts. This sends a signal for these fuel suppliers to begin shifting their business models to focus on delivering clean heat services, such as installing and maintaining heat pumps, rather than supplying fossil-fuel-fired furnaces, boilers, and water heaters. CHS also closes a potential loophole that would leave regulated utilities bearing all the costs of the clean energy transition while unregulated fuel suppliers are exempt, reducing pressure on electricity rates.
- Building decarbonization policies can be designed to advance specific state policy priorities, such as whole-home electrification and affordable housing. For example, Massachusetts' draft CHS framework proposes requirements for "full electrification" upgrades and its new green bank is fully focused on affordable housing investments.

WASHINGTON, D.C.:
Building Energy Performance Standards + Equity and Workforce Investments

The District of Columbia enacted a building energy performance standard (BEPS) in 2018 as part of an effort to achieve its climate and energy goals and reduce energy consumption 50 percent by 2032. The policy includes a building benchmarking program in addition to the energy performance standard. Building owners who fail to comply with the BEPS by the end of the compliance cycle are penalized.

The District is also implementing an Affordable Housing Retrofit Accelerator. The Retrofit Accelerator, a collaborative effort of the District Department of Energy & Environment (DOEE), the D.C. Green Bank, and the District of Columbia Sustainable Energy Utility (DCSEU), is a one-stop-shop resource hub that helps owners of multifamily affordable housing comply with BEPS requirements. It offers ASHRAE Level II energy audits at no cost and provides ongoing technical assistance, access to direct financial and contractor support, and enhanced incentives and financing from the D.C. Green Bank for improvements to qualifying units. Beyond helping building owners comply with BEPS, the program aims to also lower residents' utility bills and improve their health and comfort. In addition, the DCSEU is implementing an affordable home electrification program that provides support for electrification and solar investments to low-income homeowners.

KEY TAKEAWAYS:

- D.C. policymakers recognized that owners of affordable housing would need extra support to complete the energy-efficiency, electrification, or solar projects needed to reach BEPS compliance, and established the Retrofit Accelerator to fill this gap. DCSEU and DOEE conducted outreach to owners of specific buildings that were not in compliance to make them aware of the resources available to help them.
- While penalties for non-compliance with BEPS can be one source of funding for programs that assist low- and middle-income building owners, the amount of funding generated through penalties is typically modest. Additional sources of funding beyond non-compliance penalties are needed to support incentive and technical assistance programs. For example, funding for the D.C. Retrofit Accelerator has come from a mix of federal and local sources.

WASHINGTON STATE:
Cap and Invest + Clean Fuel Standard + ZEV Standard

This example describes how transportation sector policies work together to support decarbonization goals in Washington state. Several of these policies are analogous to building sector policies, so Washington's experience can offer insight on how similar policies could be combined to advance building decarbonization. Washington is pursuing several policies to achieve climate goals under its Climate Commitment Act (CCA), which establishes a cap-and-invest program that covers a broad range of sources and sets a limit on total GHG emissions. Washington has also implemented sector-level performance standards, including a clean fuel standard, analogous to a CHS for the buildings sector, and a zero-emission vehicles standard, analogous to a zero-emission standard for HVAC and water heating equipment.

Like CHS, clean fuel standards require fuel suppliers to reduce emissions. Specifically, gasoline and diesel suppliers are required to reduce the lifecycle GHG emissions (sometimes called the "carbon intensity") of the products they sell. Fuels with lower carbon intensity than the standard generate credits; fuels with higher carbon intensity create a deficit for the supplier that must be covered by purchasing credits. This creates incentives for fuel dealers to use low-carbon fuels and thereby generate credits that can be sold.

Washington has also adopted a zero-emissions vehicle standard that aims to increase the number of zero-emission vehicles (ZEVs) sold in the state. The ZEV standard replicates California vehicle regulations that are designed to reduce emissions from passenger vehicles.[6] It requires that ZEVs make up a certain minimum share of each manufacturer's overall vehicle sales; the aim is to ensure that by 2035, all new passenger vehicles sold in the state will be zero emissions. While both clean fuel standards and ZEV standards are sector-based decarbonization policies, clean fuel standards focus on reducing the carbon intensity of the fuels that are currently in use, while ZEV standards focus on shifting vehicle technology over time to zero-emission options like electric vehicles. In this way, ZEV standards are similar to zero-emission equipment standards, which seek to shift HVAC and water heating technologies to zero-emission options like heat pumps.

KEY TAKEAWAYS:

- Washington's experience illustrates that, while carbon reduction obligations provide overarching policy direction and compliance flexibility, they may need to be paired with sector-based policies to catalyze shifts away from high-emissions technologies in targeted sectors and encourage major energy providers to change their business models. These policies should be aligned and coordinated. For example, the clean fuel standard and the ZEV standard are both sector-specific policies under Washington's broader cap-and-invest program, but they impose requirements on different obligated parties: fuel suppliers and vehicle manufacturers, respectively.

[6] Under the federal Clean Air Act, states can either adopt federal vehicle standards or California's standards. Washington, along with about a dozen other states, has adopted the California program.

- CHS and clean fuel standards like those adopted by Washington can promote electric technologies or biofuels, depending on how they are designed. Washington's clean fuel standard is designed to allow both options: fuel suppliers can reduce the carbon intensity of transportation fuels by producing or blending low-carbon biofuels into the fuel they sell, or by purchasing credits generated by low-carbon fuel providers, including electric vehicle charging stations.

Conclusion

Decarbonizing buildings is essential to achieve climate and energy goals, but no single policy will suffice to address this complex sector. To effectively set the table for equitable building decarbonization, states should advance policies across all four "legs" identified in this brief: equity and workforce investments, carbon reduction obligations, codes and standards, and utility planning and regulation.

The policy options and state examples presented here illustrate various avenues for states and other stakeholders to consider and can be adapted to fit states' specific goals and context. While a combination of policies will be needed to achieve the pace and scale demanded by ambitious climate goals, states can choose the specific pathways and policy options they prefer to get there.

Building decarbonization strategies will be most effective when all their elements work well together. Thus, states will see the strongest results when they promote cohesive, coordinated policies across agencies; balance incentive-based and standard-based policies; work toward a seamless marketplace experience; and track results and GHG impacts across multiple programs.