STATE ENERGY EFFICIENCY SCORECARD: 2021 PROGRESS REPORT

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ACEEE
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Contents

About ACEEE

The **American Council for an Energy-Efficient Economy** (ACEEE), a nonprofit research organization, develops policies to reduce energy waste and combat climate change. Its independent analysis advances investments, programs, and behaviors that use energy more effectively and help build an equitable clean energy future.

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Executive Summary

KEY FINDINGS

- In early 2021, state policymakers intensified efforts to accelerate clean energy development while also making new energy efficiency investments to help meet climate goals and aid economic recovery from the COVID-19 pandemic. In **Illinois**, **Colorado**, **Massachusetts**, **Minnesota**, **North Carolina**, **Oregon**, and **Washington**, new energy laws set ambitious goals to decarbonize state economies with electrification as a growing priority.
- Several of these new laws have provisions to promote clean heating by reforming efficiency policies to incentivize fuel switching. These include **Minnesota**'s **Energy Conservation and Optimization (ECO) Act**, **Illinois**'s **Climate and Equitable Jobs Act (CEJA)**, and **Colorado**'s **SB21-246** encouraging beneficial electrification. Colorado and Minnesota also took additional steps to decarbonize the natural gas industry, establishing new regulatory frameworks to slash emissions from the sector.
- The growing urgency of the climate crisis was underscored by extreme weather disasters—including a February storm in Texas and an unprecedented Pacific Northwest heat wave in June—that brought large-scale power outages and hundreds of casualties. The need to act was further highlighted by the August release of the *Sixth Assessment Report* from the Intergovernmental Panel on Climate Change, showing that global emissions must be drastically reduced in the next decade and beyond in order to avert catastrophic impacts of climate change.
- Several states took steps to advance more-efficient building energy codes, many with long-term goals to establish net-zero-energy construction codes. States adopting or implementing the 2018 International Energy Conservation Code (IECC) in 2021 included **Hawaii** and **Virginia,** adding to the sizeable list of states across the United States that have already done so. The new 2021 IECC, which the U.S. Department of Energy (DOE) has determined provides a 9.4% improvement in energy savings relative to the previous code, is also under review in many states including Connecticut, Delaware, Illinois, Maryland, Massachusetts, New Jersey, New York, Vermont, Washington, and Wisconsin, as well as the District of Columbia.
- In one of the most active years in recent history for state appliance standards, five states plus the District of Columbia (D.C.) adopted energy- and water-saving standards for a variety of appliances. The new state laws in **D.C.**, **Maine**, **Massachusetts**, **Nevada**, **Oregon**, and **Rhode Island** will require minimum energy and water use efficiency levels for more than 15 types of products including air purifiers, computers, and restaurant equipment.

- Following months of negotiations, Congress reached an agreement on a $1 trillion infrastructure bill signed by President Biden in mid-November. It provides billions in funding toward weatherization, building energy codes, home and building upgrades, worker training, and transportation electrification. Together with other federal funds also made available through the 2021 American Rescue Plan Act and other programs, states have a historic opportunity to support a strong and equitable economic recovery and clean energy transition.
- Nationwide savings from ratepayer-funded electric efficiency programs declined 1.1% in 2020, from 26.9 million megawatt-hours (MWh) in 2019 to 26.6 million MWh. This decrease reflects the significant disruptions to the energy efficiency industry from the pandemic. However, impacts varied across states as policymakers took different approaches to challenging conditions.

In the early spring of 2021, against the backdrop of extreme weather events and the racial and economic inequities exacerbated by the COVID-19 pandemic, federal, state, and local policymakers renewed their efforts to kick-start clean energy deployment. Recognizing the potential for energy savings to reduce energy bills for households and businesses, create jobs, and reduce emissions, states are advancing efficiency across multiple sectors to meet climate goals and bring about a just and equitable energy transition inclusive of all communities.

At the federal level, efforts such as rejoining the Paris Agreement, together with new national goals to cut greenhouse gas (GHG) pollution in half by 2030, achieve net-zero emissions by mid-century, and make half of all new vehicles sold in 2030 zero-emission vehicles, bring new opportunities for collaboration with states to advance clean energy and energy efficiency (White House 2021c, 2021b). Following months of negotiation, Congress reached an agreement on a $1 trillion infrastructure bill signed by President Biden in mid-November. The bill includes, among other programs, $3.5 billion for weatherizing homes of low-income households; more than $1 billion for building energy codes, new revolving loan funds supporting commercial building and home upgrades, public school and federal building upgrades, and worker training; $7.5 billion for installation of electric vehicle (EV) chargers; and millions more for industrial energy efficiency.

These investments, on top of other federal funds like those offered under the 2021 American Rescue Plan Act (ARPA), Weatherization Assistance Program, and State Energy Program, together are offering states unprecedented levels of federal support toward sustainable economic development and addressing climate change (Dewey, Mah, and Howard 2021). In

addition, a long debated $1.8 trillion climate and social spending bill, which would include further support for efficiency upgrades, building decarbonization, and vehicle electrification, remained in limbo at the close of 2021, its future uncertain amid ongoing negotiations in January 2022.

Many states also made waves with an assortment of new clean energy legislation. These included **Illinois**, **Massachusetts**, **Minnesota**, **Colorado**, **Oregon**, and **Washington**, each of which enacted laws to reduce carbon emissions along with utility reforms to expedite electrification of fossil fuel end uses. For example, new laws in Colorado (SB 21-264's Clean Heat Standard) and Minnesota (the Natural Gas Innovation Act) call on natural gas utilities to ramp up decarbonization efforts.

The year was also a successful one for energy-efficient standards for appliances. While the U.S. Department of Energy worked mostly on changes to its procedures during the Trump and early Biden administrations, falling behind on reviews of existing federal standards, several states took the lead by passing efficiency standards of their own for more than 15 types of products such as air purifiers, computers, and restaurant equipment. Massachusetts passed the first standards for EV chargers, and Nevada became the first state to adopt standards for gas fireplaces and air purifiers.

As federal policymaking to advance new fuel economy standards for passenger cars and light trucks moved gradually to recover from the previous administration's efforts to derail progress, most momentum could be found at the state level. **Virginia**, **Washington**, **Nevada**, **New Mexico**, and **Minnesota** all took important steps to follow in California's footsteps and adopt the Golden State's clean car rules, including its low-emission vehicle (LEV) regulations and zero-emission vehicle (ZEV) program. Virginia passed HB 1965, making it the 15th state to adopt California's ZEV program, and other states moved forward in various stages of rulemakings with implementation to begin in the coming years if approved.

A variety of states made important moves to advance more-efficient building energy codes in 2021, many with long-term goals to establish net-zero-energy construction codes in coming years. States adopting or putting into effect the 2018 International Energy Conservation Code (IECC) in 2021 included **Hawaii** and **Virginia**. Several states—including Connecticut, Illinois, Maryland, New Jersey, New York, and others—also began code reviews of the new 2021 IECC, determined by DOE to offer a 9.4% improvement in energy savings relative to the previous 2018 code. Illinois and Massachusetts also passed legislation calling for new high-performance stretch codes that will enable local jurisdictions to go beyond

baseline codes to deliver higher savings in support of new state climate goals.[1] Also earlier in 2021, **Colorado** signed HB 1286 to become the second state, after Washington, to adopt a building energy performance standard for large buildings, a critical step forward for addressing energy waste in existing construction. Washington's program goes into effect in 2026, though an early-adopter incentive program started in 2021.

REGIONAL HIGHLIGHTS

In an especially busy year for clean energy policy, state governments across all regions of the United States introduced important reforms to set new efficiency codes and standards, phase out fossil fuel consumption, and direct added investment toward efficiency programs. The following sections highlight a selection of high-impact policy updates made by regional efficiency leaders in 2021.

MIDWEST

In both **Minnesota** and **Illinois**, long-in-development energy omnibus laws finally won approval from state legislators in 2021, delivering wide-reaching clean energy reforms and strengthening energy efficiency goals. Minnesota's **Energy Conservation and Optimization (ECO) Act** strengthened the state's energy efficiency resource standard, raising annual savings targets to levels that are among the highest in the region. Importantly, it also expanded the scope of measures eligible for efficiency incentives to include beneficial fuel switching under certain conditions. The ECO Act also increases funding for low-income energy efficiency programs and updates and raises the statewide energy efficiency goal, including nonutility sector savings from rate design and building energy codes. Further boosting decarbonization efforts is Minnesota's recently passed **Natural Gas Innovation Act (NGIA)**, which establishes a new regulatory framework whereby natural gas utilities can implement and recover costs from a broad range of carbon-cutting "innovative resources" like renewable natural gas, green hydrogen, strategic electrification, and energy efficiency. The legislature also authorized creation of a Minnesota Efficient Technology Accelerator (META), a market transformation program that will offer technology manufacturers and

[1] While Massachusetts had an existing stretch code that went beyond baselines, legislation signed in March called for a new, strengthened municipal opt-in stretch code that includes net-zero buildings provisions.

equipment installers support for emerging and innovative efficient technologies and address barriers to adoption.

In **Illinois**, Governor J. B. Pritzker in September signed the **Climate and Equitable Jobs Act** (CEJA), which lays out profound changes to the state's power sector and a goal to achieve 100% carbon-free electricity by 2045. Among CEJA's legislative changes are an extension of the state's utility savings targets beyond 2030 and adoption of a new opt-out provision replacing the state's previous efficiency program exemption for large customers. CEJA also strengthens investments in low-income programs and creates a health and safety fund for needed repairs to buildings occupied by low-income households. The law also calls for the state to develop a stretch energy code that will enable jurisdictions to strengthen efficiency beyond the statewide base code, and utility reforms allowing incorporation of electrification into efficiency portfolios.

Northeast

In **Massachusetts**, **S.9, An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy**, was among the most sweeping pieces of climate policy legislation adopted in 2021. It sets a new 2050 net-zero emissions goal and includes technology adoption benchmarks for efficiency measures like electric vehicles (EVs), charging stations, and heat pumps. S.9 also imposes changes to statewide energy efficiency programs, including the addition of the social cost of carbon in benefit-cost screening and emissions-reduction requirements for each three-year energy efficiency plan to align energy efficiency investments with Massachusetts climate goals. For new construction, the bill requires the creation of a new "net-zero" top tier in the Massachusetts stretch building energy code by 2023 that jurisdictions can choose to implement. Also included in the bill are a wide range of appliance standards that will save consumers money on their energy and water bills. Additionally, the legislation includes provisions to expand outreach to environmental justice populations and is anticipated to bring significant changes to efficiency programs, with a renewed focus on clean heating and electrification measures in order to meet the state's GHG reduction goals. In July, per S.9, the state's Department of Energy Resources introduced new GHG limits specific to the Mass Save energy efficiency program, with a strengthened emphasis on building retrofits, including envelope improvements and efficient electrification (Massachusetts DOER 2021b). In September, Governor Charlie Baker signed an executive order establishing a Commission on Clean Heat to establish a framework for reducing heating fuel emissions consistent with the goals of S.9 and the state's 2050 Decarbonization Roadmap.

Maine has also demonstrated climate leadership in recent years across multiple policy fronts, achieving progress on building energy codes, clean heating, and EV deployment. Following a 2020 rulemaking, the 2015 IECC took effect for new construction in Maine in July of 2021, a considerable leap in efficiency beyond the state's previously adopted 2009 IECC. The state also adopted the 2021 IECC as a stretch code, providing municipalities the opportunity to achieve additional savings. Maine's Four-Year Plan for Climate Action, issued in December 2020, established a goal to go even further by developing a plan by 2024 to phase in building codes to reach net-zero carbon emissions for new construction by 2035. In July Governor Janet Mills also signed a bill setting new appliance energy and water standards for a range of products including computers, computer monitors, and certain plumbing fixtures. In September the governor announced that more than 28,000 high-efficiency heat pumps had been installed across the state over the previous year, a major milestone in the state's effort to install 100,000 new heat pumps by 2025. The state is also in the process of developing a Clean Transportation Roadmap to set forth a comprehensive plan for advancing EV adoption in Maine with equity as a key focus.

SOUTH

Following the 2020 signing of the historic **Virginia Clean Economy Act (VCEA)**, which charts a course to a 100% carbon-free power sector by mid-century, state policymakers continued to work with utilities and stakeholders to develop the regulatory framework to implement expanded energy-saving utility programs under the VCEA's energy efficiency resource standard. The 2021 legislative session also delivered several important follow-up bills designed to implement the VCEA, including SB 1282, which establishes a process to inventory statewide GHG emissions every four years. Also in 2021, Virginia's Uniform State Building Code was updated to incorporate energy efficiency provisions of the 2018 IECC and ASHRAE 90.1-2016, effective July 2021. Further, Virginia committed to accelerating statewide adoption of EVs and more-efficient internal combustion vehicles by enacting HB 1965, thus becoming the 15th state to join California's ZEV program, which it further supported through legislation establishing EV rebates, including higher incentives for income-eligible residents. Also, 2021 was Virginia's first year participating in the Regional Greenhouse Gas Initiative (RGGI). The state has made equity a centerpiece of its RGGI investment strategy by dedicating half of all carbon allowance proceeds to low-income energy efficiency programs.

North Carolina continued to make incremental progress in its efforts to realign utility regulations around strengthened goals to slash statewide emissions. This work was begun in 2018 under Governor Roy Cooper's Executive Order 80 and was further guided by the state's 2019 Clean Energy Plan (CEP). Stakeholders convened the NC Energy Regulatory Process

throughout 2020 to consider updates to utility regulations and electricity market structures, in line with CEP goals to reduce power sector GHG emissions 70% by 2030 and attain carbon neutrality by 2050 (Brooks et al. 2020). In October 2021 these goals were formalized with the adoption of **HB 951**, which sets in place a carbon reduction plan. This legislation had drawn mixed reactions from clean energy stakeholders for its uncertain enforcement language and had been opposed by consumer advocates due to its potential to allow higher utility profits and significant increases to energy bills (Shober 2021; Howland 2021).

Southwest

It was a pivotal year for clean energy legislation in **Colorado,** which delivered a raft of important reforms to decarbonize the state's building sector and slash emissions from natural gas use. These include **SB21-264**, which requires gas distribution utilities to file with the public utilities commission (PUC) a clean heat plan that delivers a 4% reduction in GHG emissions by 2025 and 22% by 2030. **HB21-1238** establishes a process to set natural gas savings targets similar to those already in place for electric demand-side management programs. And **SB21-246** sets building electrification targets for the state's investor-owned utilities (IOUs). The state also adopted legislation mandating a building energy performance standard for existing construction, becoming the second state to do so. **HB21-1286** requires annual energy reporting for Colorado's large buildings and development of a performance standard to reduce GHG emissions from these structures 20% by 2030 (CO General Assembly 2021). In addition, the state took important steps to modernize and streamline utility grid transmission planning with the adoption of SB 72.

Nevada, too, delivered an eventful legislative session in 2021, packed with sweeping energy reforms. This included the **New Energy Economy Act (SB 448)**, which contains updates strengthening regional electric grid planning, expanded EV charging infrastructure, and doubling energy efficiency funding for low-income customers and public schools in underserved communities (Nevada Legislature 2021b). In May the state PUC launched an investigation into long-term planning for natural gas, including consideration of costs and impacts of displacing natural gas with electrified heating and how to decarbonize in a way that is equitable for ratepayers (PUCN 2021). Also in June, Governor Steve Sisolak signed **SB 430**, revising and expanding the scope of the new Nevada Infrastructure Bank to include projects targeting water, wastewater, renewable energy, and other services. It also provides the bank with an initial $75 million in seed funding as part of the governor's budget (Nevada Legislature 2021a). These bills build on and support the state's goals, signed in 2019, to source half its electricity from renewables by 2030 and achieve a 100% carbon-free grid by 2050 (Nevada Legislature 2019). In addition, over the summer the Nevada legislature passed

AB 383, its third appliance efficiency bill in three years, setting energy savings standards for 13 household and commercial products. In July the state also adopted the 2021 IECC for residential buildings; while the code is not being enforced statewide, a significant number of local governments are moving forward with its adoption. In October Nevada also adopted Clean Cars Nevada, which implements California's Low Emission Vehicle (LEV) standards for tailpipe emissions, joining 16 other states that have also adopted the standards. The regulations also adopt California's Zero Emission Vehicle (ZEV) program.

WEST

Last year's *State Scorecard* leader, **California**, continued to set a strong example for other states with efficiency progress across the utilities, transportation, and buildings sectors. In May utility regulators passed policy reforms introducing a new "total systems benefit" intended to better capture the multiple value streams of efficiency in a single goal framework. Other important changes advanced by the decision (D.21-05-031) include a reorganization of the energy efficiency portfolio into discrete segments; this is designed to optimize the achievement of distinct program goals like advancing market transformation and serving disadvantaged communities. The state also made important strides toward decarbonizing the buildings sector with the introduction of its 2022 Building Energy Efficiency Standards, the first code in the nation to include efficient electric heat pumps as a baseline technology. The code also establishes other electric-readiness requirements to facilitate clean electric heating, cooking, and EV charging and would expand onsite solar PV and battery storage standards (CEC 2021). California also released the Caltrans Zero Emission Vehicle (ZEV) Action Plan 2.0 earlier in the year, responding to a 2020 executive order aiming to phase out gasoline-powered vehicles by 2035 and including strategies to reach out to priority communities.

Oregon also had a busy year passing a suite of important clean energy legislation. HB 2021, signed in July, sets an ambitious 2040 target to decarbonize the state's power sector (Oregon Legislative Assembly 2021a). The legislature passed multiple laws to address important equity issues and alleviate customer energy burdens exacerbated by the pandemic. These included the Energy Affordability Act (HB 2475), which includes provisions enabling utilities to consider equity-related factors in determining customer energy rates. It also potentially helps strengthen representation among historically marginalized communities by calling for a process to provide financial assistance for groups participating in PUC regulatory proceedings (Oregon Legislative Assembly 2021b). HB 3141 directs the PUC to set equity metrics for Energy Trust of Oregon funds in addition to increasing weatherization funding for low-income customers. Further, the 2021 Oregon Residential and

Commercial Specialty Codes went into effect April, including efficiency improvements through changes to envelope, ventilation, and mechanical requirements. The 2021 legislative session focused on transportation electrification as well: HB 2165 strengthens the state's EV rebate program with expanded benefits for low- and moderate-income customers and directs further IOU investments toward EV charging infrastructure, with enhanced focus on underserved communities, and HB 2180 requires new apartment buildings and commercial buildings to be built "EV-ready."

In **Washington**, lawmakers built on the momentum of last year's adoption of a 2050 goal to achieve net-zero emissions by passing the Climate Commitment Act, a cap-and-invest law that puts an enforceable, declining limit on all major sources of GHG emissions across the economy. A mechanism for auctioning and trading emissions credits is due in January 2023, with revenues going toward climate and transportation projects. The legislature also passed HB1091, requiring the state to develop a low-carbon fuel standard under which fuel suppliers must reduce the carbon intensity of transportation fuels to 20% below 2017 levels by 2038. These bills also include important spending carve-outs to invest program revenues in overburdened populations and directing funds toward transportation electrification opportunities for low-income residents.

Introduction

This report provides an overview and updates progress made by states in advancing important energy efficiency policies and programs in 2021. With the United States emerging in the early spring from what was, one hopes, the worst of the pandemic, federal, state, and local policymakers leaned heavily into efforts to kick-start clean energy deployment, motivated both by the dramatic impacts of extreme weather events and climate change and by the deep racial and economic inequities exacerbated by the virus-driven downturn. Recognizing the potential for energy savings to reduce energy bills for households and businesses, create jobs, and reduce emissions, states are advancing efficiency across multiple sectors to meet climate goals and bring about a just and equitable energy transition inclusive of all communities.

Since 2006 ACEEE has published the *State Energy Efficiency Scorecard*, an annual benchmark of state progress on energy-saving policies and programs and highlighting best practices and cutting-edge efficiency strategies in leading states. This year, given the widespread and dramatic impacts of the pandemic across the energy efficiency industry and its significant disruptions to state and utility programs and performance, we decided to temporarily forgo a formal *Scorecard* ranking in favor of an unranked and unscored end-of-year progress report that still recognizes the latest developments in energy-saving state policies. We intend to return with a new *Scorecard* ranking and revised scoring methodology in 2022, one with a greater focus on efforts to align efficiency policies with state climate efforts, as well as new metrics assessing state efforts to promote equitable access to and benefits from clean energy and efficiency investments. Development of these new equity categories is currently ongoing as part of ACEEE's Leading with Equity initiative, a collaboration with community-based organizations, advocates, and utilities to jointly define success for equitable decarbonization, in parallel with work to embed new metrics in our utility, state, and city *Scorecards* (ACEEE 2021b). A white paper describing the initiative's first key findings and next steps was released in December 2021 (Drehobl 2021).

The following pages offer a summary of major state updates across several policy areas:

- Transportation policies
- Utility and public benefits programs and policies
- Equity in state energy efficiency planning
- Building energy efficiency policies
- Appliance and equipment standards

1. Transportation Policies

The transportation sector is the nation's largest source of GHG emissions, accounting for roughly 29% of the total, according to the national greenhouse gas inventory. It thus represents the largest policy opportunity for states to address climate goals (EPA 2021a). Doing so requires a comprehensive approach that addresses the energy efficiency of both individual vehicles and the transportation system as a whole, particularly its interrelationship with land-use policies. And electric vehicles, currently accounting for only a small fraction of national market share, will need to rapidly scale up alongside charging infrastructure in coming years to leverage the steadily improving carbon benefits of the electric grid as renewables make up a growing portion of generation.

States and utilities continued to lay the groundwork in 2021 for a clean transportation future across a variety of policy fronts: setting ambitious targets for vehicle efficiency, forming regional partnerships to build interstate EV charging corridors, opening utility proceedings to balance transportation electrification plans with grid demands, and incorporating EV-supportive requirements in building energy codes. At the same time, state and federal policymakers pursued large-scale initiatives to make progress at the systems level, with expanded investment in freight and transit efficiency, while also securing equity provisions to ensure that programs and benefits are accessible to all customers. The following sections highlight some of the major policy achievements of 2021 and trends to watch.

FEDERAL AND STATE ADVANCEMENTS IN CLEAN CAR RULES

California's Zero-Emission Vehicle (ZEV) Program has played a central role among states seeking to increase market share of electric vehicles (EVs). Currently adopted by a total of 15 states that account for more than 30% of new car sales in the United States, the program requires automakers to produce and deliver a certain number of ZEVs and plug-in hybrids, the number increasing each year, with goals for 12–15% of sales by the 2025 model year (Leard and McConnell 2020).[1]

Also critical in spurring national and state efficiency in the sector have been California's low-emission vehicle (LEV) regulations, which impose fleet-wide standards for criteria pollutants

[1] In addition to California, these states are Colorado, Connecticut, Maine, Maryland, Massachusetts, Minnesota, Nevada, New Jersey, New York, Oregon, Rhode Island, Vermont, Virginia, and Washington.

and GHG emissions on light-duty vehicles and are currently adopted in 17 states.[2] The list of LEV/ZEV states continued to grow in 2021 with Virginia's passage of legislation to adopt both California's LEV and ZEV standards. States adopting or working toward implementing LEV/ZEV standards in 2021 also included Washington, Nevada, New Mexico, and Minnesota.

- **Virginia** enacted HB 1965 in March 2021, becoming the 14th state to join California's ZEV program. This came during a year in which the state also passed legislation to offer a $2,500 rebate for EV purchases, with higher incentives available for income-eligible residents, although legislators have yet to fund the program in the state budget. As of early 2021, all of Virginia's $46 million in Volkswagen Settlement awards had gone to EVs and EV charging (Smith 2021).
- **Washington** adopted similar clean cars legislation in 2020 to adopt a ZEV program and began the rulemaking process in June 2021. The state legislature also sought to go further, passing a law in April that would have set a target for all model year 2030 (and beyond) passenger vehicles and light-duty trucks sold in the state to be electric. However, this was rejected by governor's veto over privacy and equity concerns regarding the bill's ties to a proposed per-mile road usage charge designed to replace the state gas tax (State of Washington Office of the Governor 2021).[3]
- **Nevada** advanced draft clean car standards per Governor Steve Sisolak's 2020 call for regulations adopting California's rules. Following workshops and public comment, the State Environmental Commission approved the Clean Cars Nevada regulations in September with widespread support. In October the state approved the program in a bipartisan vote, making Nevada the 16th state to adopt clean car rules (Nevada Clean Cars 2021).
- In June 2021, **New Mexico** Governor Michelle Lujan Grisham announced that the state and the city of Albuquerque would collaborate to adopt clean car rules by the spring of 2022. The city and the New Mexico Environment Department kicked off the rulemaking process in July, along with public engagement meetings.[4]

[2] These include California, New York, Massachusetts, Vermont, Maine, Pennsylvania, Connecticut, Rhode Island, Washington, Oregon, New Jersey, Maryland, Delaware, Colorado, Minnesota, Nevada, and Virginia.

[3] California has established a similar target for 2035.

[4] The City of Albuquerque with Bernalillo County is a separate air quality jurisdiction from the New Mexico Environment Department; thus the two entities are working together to adopt rules in parallel.

- In 2019 **Minnesota's** governor called for creation of the Minnesota Clean Car program through the adoption of California's rules. While the rules have faced opposition in the state legislature, in May 2021 an administrative law judge approved them, confirming that they are needed and reasonable and comply with administrative law rules. The state pollution control agency expects the standards will apply to vehicles beginning with model year 2025.

States also continue to complement these efforts by working in regional collaboratives to improve charging accessibility, coordinating interstate EV infrastructure planning and deployment across major travel corridors. One example is **REV West**, a coalition of eight western states working to create an Intermountain West EV Corridor through harmonized best practices and voluntary minimum standards (NASEO 2022).[5] Another is the **Southeast Regional Electric Vehicle Information Exchange** (SE REVI), a coalition of nine southeastern states and two U.S. territories that share information and best practices while collaborating on EV infrastructure planning, policy development, and program implementation.[6] In 2021 SE REVI launched a multistate ArcGIS EV infrastructure map to enable coordination across the region on EV infrastructure investments.[7]

Similarly, in September 2021 the governors of Illinois, Indiana, Michigan, Minnesota, and Wisconsin signed on to an agreement to create a **REV Midwest** coalition. They plan to accelerate vehicle electrification across the region through a similar approach that includes a pledge to advance equity by working with historically disadvantaged communities to make charging infrastructure available to all (REV Midwest Coalition 2021). Also initiated in 2021, the **Electric Highway Coalition** (EHC) is an alliance of major utility companies working together to develop a single network of DC fast charging stations connecting Texas to the Midwest to states along the Gulf and Atlantic Coasts. Initial signatories to the coalition

[5] The states are Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.

[6] The states and territories are Alabama, Arkansas, Florida, Georgia, Kentucky, Mississippi, North Carolina, Puerto Rico, South Carolina, Tennessee, and the U.S. Virgin Islands.

[7] The interactive map utilizes various data, including locations of current and planned Level 2 and DC fast chargers, state and national parks, Federal Highway Administration–designated Alternative Fuel Corridors, hurricane evacuation routes, social equity data, and electric service provider territories. Developed with input from each SE REVI participant, the map can be used to inform EV infrastructure investment decisions and to conduct education and outreach on EV infrastructure gaps and opportunities along priority corridors. See tdec.maps.arcgis.com/apps/Viewer/index.html?appid=35a5c876170248e1a5b54202901793a9.

included American Electric Power, Dominion Energy, Duke Energy, Entergy Corp., Southern Co., and the Tennessee Valley Authority. By September the EHC had grown to 17 member utilities operating in 29 states and the District of Columbia (PPL 2021).

These state-level efforts continue to serve as vital examples for others at a time when federal progress has been slow to recover momentum lost under the previous administration's attack on already approved standards. In August the Biden administration unveiled its own proposed standards for passenger cars and light trucks through model year 2026, and later issued finalized rules in December. The new standards are expected to result in average fuel economy label values of 40 mpg for MY 2026 and 17% of vehicle sales being electric by that same year. While an improvement upon the initial proposal from earlier in the year, the rules also include loopholes that mean reductions will be about a quarter lower than they otherwise would be (ACEEE 2021a).

OPPORTUNITIES TO ADVANCE FREIGHT EFFICIENCY

Freight transport accounts for a large but often overlooked share of U.S. greenhouse gas emissions, contributing 30.2% of all transportation-sector GHG emissions in 2018 and growing by 9.7% since 2015 (EPA 2021c; BTS 2019). Freight trucks in particular, emitting 10 times as much GHG per ton-mile as freight rail, offer an enormous opportunity for states to reduce carbon (Laska 2021). While federal fuel efficiency standards and vehicle electrification will bring substantial GHG reductions, an anticipated increase in vehicle miles traveled that overtakes efficiency gains means that the sector will require improvements in whole-system efficiency, freight network optimization, and changes in how goods travel (Langer and Vaidyanathan 2020).

Following California's 2020 adoption of its nation-leading Advanced Clean Trucks (ACT) rule and Heavy-Duty Omnibus rule, a major trend in 2021 was a growing interest among other states in adopting similar regulations to slash truck pollution. California's ACT rule achieves this through two components: setting long-range targets to increase sales of zero-emission trucks, and requiring that large employers share information about shipments and shuttle services to inform future strategies for scaling up purchases of ZEV trucks. Meanwhile the Heavy-Duty Omnibus rule addresses emissions from diesel trucks that continue to be sold by raising efficiency standards, mandating a 90% reduction in nitrogen oxides (NOx) from heavy-duty vehicles in the 2024–2027 time frame. Several states including Massachusetts, Maine, New Jersey, New York, Oregon, and Washington have either taken steps or expressed interest in adopting the ACT rule in the near future. These efforts build on the commitment made by 15 states and the District of Columbia in a July 2020 medium- and heavy-duty ZEV

memorandum of understanding that set goals to achieve 100% ZEV sales by 2050, with an interim target of 30% by 2030.[8]

Several state governments sent a letter to President Biden in early 2021 requesting national standards requiring that all sales of medium- and heavy-duty vehicles be zero-emission by 2045.[9] Months later the president signed an executive order, "Strengthening American Leadership in Clean Cars and Trucks," setting a goal that zero-emissions vehicles make up 50% of all new sales of passenger cars and light-duty trucks by 2030. The executive order also directs the EPA and the U.S. Department of Transportation (DOT) to issue final rules by July 2024 addressing fuel efficiency and GHG standards for passenger cars, light-duty trucks, and medium- and heavy-duty engines (White House 2021b). It further directs the EPA to coordinate with California as well as the other states that have adopted California's vehicle standards.

States together with the federal government can advance freight efficiency in several other important ways. For example, federal transportation funding authorization bills have increasingly recognized the importance of freight transportation and the need for freight policy guidance. MAP-21 (2012) and more recently the FAST Act, which has authorized federal funding on transportation since 2016, have set performance measure requirements as part of fund disbursement. However, these policies have lacked environmental and GHG considerations almost entirely and fallen short of addressing national freight goals. Similarly, while states must have developed and approved freight plans as part of eligibility requirements for federal funding, the plans are not currently required to show how states will reduce freight sector emissions.[10] Emissions reductions requirements were absent from infrastructure and budget reconciliation bills advanced by Congress and can be expected to remain a blind spot in federal freight policy for the foreseeable future.

States can lead on multiple fronts. They can (1) provide input informing federal efforts that shape and improve national freight policy, (2) establish freight plan goals and targets

[8] See www.energy.ca.gov/sites/default/files/2020-08/Multistate-Truck-ZEV-Governors-MOU-20200714_ADA.pdf.

[9] See https://www.gov.ca.gov/wp-content/uploads/2021/04/4.21.21-Multi-State-Governors-ZEV-Letter.pdf.

[10] DOT issued a rule in January 2017 establishing carbon dioxide (CO_2) emissions from vehicles on the National Highway System as a performance measure, meaning that states were required to track and set targets for those emissions. However, the Trump administration repealed this requirement in May 2018.

beyond those required by federal rules and in coordination with other state priorities related to climate, economy, health, equity, and transportation, and (3) quantify state freight emissions alongside adoption of reduction targets. A review of state freight plans by ACEEE found few that have incorporated these best practices. However, exceptions include California, which has set a goal of a 20% reduction in the carbon intensity of goods movement by 2030. Looking forward, states should prioritize steps to factor societal priorities such as health, equity, and the environment into freight planning, even in the absence of clear federal guidance (Langer and Vaidyanathan 2020).

STATE POLICIES SEEKING TO ENSURE EQUITABLE BENEFITS

The year 2021 saw an acceleration of policy activity at all levels of government related to transportation electrification. Executive orders from the Biden administration called for an all-electric federal fleet by 2035 and set a 2030 target to have ZEVs make up half of all new vehicles sold; there was also important new federal guidance and funding to support charging infrastructure deployment (White House 2021c, 2021b, 2021a). States like California and New York moved to phase out gasoline-powered vehicles altogether, each requiring that by 2035 all new passenger cars and light-duty trucks sold be zero emission. And in November 2021, Governor Jay Inslee of Washington signed an executive order moving the state government to an all-electric fleet of vehicles by 2035.[11] Beyond simply increasing EV sales, these strategies must ensure accessibility for all communities and must accommodate multiple modes of transportation, as well as emerging mobility options like bike sharing and electric scooter programs to address service gaps (Vaidyanathan, Huether, and Jennings 2021).

In many cases, these efforts to transform the transportation sector are proceeding with cautious recognition of current structural inequities faced by low-income and environmental justice communities, as well as the potential for new incentive programs to either mitigate or exacerbate these imbalances. These communities often face disproportionately high transportation costs (Vaidyanathan, Huether, and Jennings 2021). They are also more likely to live in areas with higher exposure to air pollution from transportation and industrial sources and are likely to have less access to high-quality and frequent transit options (Valentine 2020; Spieler 2020). The impacts of COVID-19 have worsened these inequities as

[11] See www.governor.wa.gov/sites/default/files/exe_order/21-04%20-%20Zero%20Emission%20Vehicles.pdf.

these communities experience higher rates of asthma, are less likely to be able to work from home, and are more likely to rely on public transportation, which has faced declines in service in response to lower overall ridership.

With that in mind, states are undertaking a wide range of reforms to protect these residents, ensuring that they are able to access efficient, low-carbon, and affordable modes of transportation while also making certain that the benefits of clean transportation accrue equitably to historically marginalized communities. Many of these recommended policies are highlighted in recent ACEEE research that found the average gasoline cost burden for low-income American households is twice the national average (Vaidyanathan, Huether, and Jennings 2021). States are addressing these challenges by:

Ensuring continued public transportation investment.

- California's Transit and Intercity Rail Capital Program (TIRCP) was created to fund transformative capital improvements that modernize California's intercity, commuter, and rail systems, and bus and ferry transit systems, to significantly reduce emissions of greenhouse gases, vehicle miles traveled, and congestion. TIRCP, funded through the state's Cap-and-Trade Program, includes a goal to provide at least 25% of available funding to projects that offer a direct, meaningful, and assured benefit to disadvantaged communities. The state's 2021 budget bill included $2.5 billion toward the program.
- In Utah, legislators passed a $1.2 billion transportation spending package (HB433), including $100 million to expand and double-track portions of the state's FrontRunner commuter rail. The bill also includes $232 million in new bond funding for public transportation projects, such as expansion of streetcar and rapid bus transit systems, and $35 million for transportation projects that enable biking, walking, and other active multimodal travel choices (Jones 2021).

Subsidizing access to reliable, efficient transportation.

- In the spring of 2021, the DART office of the Delaware Department of Transportation launched DART Connect, a public transit pilot project funded by an Accelerating Innovative Mobility grant from the Federal Transit Administration. DART Connect is an on-demand micro-transit service that provides transportation for rural communities in Sussex County, Delaware. This project connects residents of the most rural and underserved areas of the state with flexible transportation options to get them to their jobs, doctors' appointments, and grocery stores.

Incentivizing the creation of affordable housing around transit.

- Rhode Island considers the proximity of transit facilities when distributing federal Low-Income Housing Tax Credits to qualifying property owners. The state's Long-

Range Transportation Plan released in December 2020 also establishes a long-range course for investing in Rhode Island's transportation system by increasing access to public transportation, including access by underserved communities (R.I. Department of Administration 2020).

Promoting fuel-efficient vehicles through standards and incentives.

- In New York in 2020, the Public Service Commission (PSC) approved a $701 million EV Make-Ready Program that will be funded by investor-owned utilities. The cost-sharing program will incentivize EV charging station developers to site charging infrastructure where it will provide maximal benefit to consumers. The PSC order establishing the budget (which runs through 2025) allocates $206 million toward equitable access and benefits for lower-socioeconomic and disadvantaged communities. EV projects in these communities will also be eligible for a higher incentive, as much as 100% support for the costs to make a site ready for EV charging. Under a range of initiatives, including EV Make-Ready, EVolve NY, and Charge NY, the state is rapidly multiplying the number of charging stations with a goal to deploy more than 50,000 new public and commercial Level 2 charging ports across the state by 2025.
- Pennsylvania's Driving PA Forward Initiative offers eight grant and rebate programs aimed at improving air quality through clean transportation technologies. Funding programs for DC fast charging award additional points to proposals for projects located in environmental justice areas, which increases the number of funded projects in these areas. Additionally, Pennsylvania's upcoming funding rounds for its DC Fast Charging and Hydrogen Fueling Grant program will place greater scoring and funding emphasis on filling in gaps along interstate highways, which will improve access to electric vehicle supply equipment (EVSE) in areas that currently have few options.
- Using proceeds from New Jersey's participation in the Regional Greenhouse Gas Initiative (RGGI), Governor Phil Murphy announced a $13.7 million investment in electric buses and trucks to reduce emissions and improve air quality in overburdened communities. Since February 2021, New Jersey has committed nearly $71 million in RGGI proceeds to purchase EVs and install charging stations in environmental justice communities. The governor also announced a $20 million expansion of the state's Zero Emission Incentive Program (NJZIP)—currently available in the greater Newark, Camden, and New Brunswick areas—into overburdened communities in the greater Jersey Shore area. This program increases the adoption and use of zero-emission medium-duty vehicles by offering vouchers to businesses and organizations to offset the purchase cost.
- In California, in response to the governor's Executive Order N-79-20, the Caltrans Zero Emission Vehicle (ZEV) Action Plan 2.0 was released in March 2021. Committing the state to implementation that serves priority communities whenever feasible, the

plan sets goals to achieve and deploy a 100% ZEV fleet by 2045, transition to zero-emission intercity rail by 2035, fill electric vehicle charger gaps in communities where there is little or no private investment, and focus on ZEV research that benefits underserved populations. Combined with California's leadership in tailpipe emissions and ZEV standards, these efforts will yield important health and equity benefits, reduce local pollution, and provide consumer fuel savings.

- In 2021 Oregon passed HB 2165, making changes to the state's Charge Ahead Rebate, which is designed to help low- to moderate-income residents purchase an EV. The bill increases the amount of the rebate from $2,500 to $5,000 and allows low-income service providers to apply for the rebate. The rebate can be used toward the purchase of a used vehicle, which lowers the cost further. The changes took effect on January 1, 2022.

2. Utility and Public Benefits Programs and Policies

The utility sector has an important role to play in promoting efficiency by developing markets for energy-efficient products and services and valuing efficiency in planning and investment to meet customer needs. Electric and natural gas utilities and independent statewide program administrators deliver a substantial share of electricity and natural gas efficiency programs in the United States.[13] These programs, funded by utility customers through utility rates and statewide public benefits funds, encourage customers to use efficient technologies and thereby reduce their energy waste. Energy efficiency is a resource—just as power plants, wind turbines, and solar panels are.

Utilities and administrators have been delivering energy efficiency programs and market transformation initiatives for decades in some states, often driven by regulations from state utility commissions setting specific savings targets for residential, commercial, industrial, and income-qualified customers. And as a growing number of states have adopted increasingly ambitious clean energy goals, more and more are deploying energy efficiency integrated with controls to provide flexibility to the grid, complementing and facilitating the growing integration of renewable energy. Utilities are also offering more fuel-switching programs, particularly for devices powered by increasingly clean electricity, to support their greenhouse gas reduction targets.[14] ACEEE has found that by scaling up energy efficiency across multiple end-use sectors, the United States can cut energy use and greenhouse gas emissions in half by 2050 (Nadel and Ungar 2019).

This section continues our practice of reporting programs' incremental energy savings achieved from efficiency investments specifically occurring during the most recent program

[13] State governments also run major efficiency programs using funds from sources other than utility ratepayers. These programs are not included in this section. In addition, the U.S. Department of Energy (DOE) Weatherization Assistance Program (WAP), started in 1976, provides weatherization services to approximately 35,000 homes every year using DOE funds. The WAP program received $257 million in funding in fiscal year 2019 and $305 million in 2020. WAP is not considered in the *State Scorecard* given the report's state-level policy scope.

[14] ACEEE considers electrification a form of energy efficiency when it saves total primary energy and meets customer savings and emissions-reduction criteria (Gold, Gilleo, and Berg 2019).

year, thus offering a straightforward means of comparing performance on a common basis.[15] We sourced our data from information requests completed by state utility commissions and from the U.S. Energy Information Administration (EIA 2021a, 2021d, 2021e, 2021b). We shared this gathered data, along with last year's *State Scorecard* data, with state utility commissions as well as state and third-party program administrators for review.[16] Tables 1, 2, 3, and 4 provide data on electricity and natural gas efficiency program savings and spending in the most recent years for which data were available.[17]

For more information on the energy savings performance of individual large utilities, refer to *The 2020 Utility Energy Efficiency Scorecard*, also published by ACEEE (Relf, Cooper, and Gold 2020). An update on city-level energy efficiency policies can be found in *The 2021 City Clean Energy Scorecard*, released in December 2021 (Samarripas et al. 2021).

In 2020 total spending for electric efficiency decreased by about 10.8%, to $6.1 billion. Adding natural gas program spending of $1.5 billion (comparable to 2019), we estimate total efficiency program spending of approximately $7.6 billion in 2020 (see figure 1), a decrease of about 9.3% compared with 2019.

[15] Incremental energy savings are savings achieved in a given year from measures installed in that year. Annual savings, sometimes described as cumulative savings, are savings in a given year from all the measures that have been implemented under the programs in that year and in prior years that are still saving energy.

[16] While utilities serve as the energy efficiency administrator in most states, in a few states (Vermont, Oregon, Hawaii, and Wisconsin) programs are administered by independent third-party entities. In a handful of other states, programs are administered primarily by a state energy office or other state agency, or administration responsibilities are shared among the state, utilities, and third-party entities in a hybrid model.

[17] It should be noted that reporting incremental savings does not reflect savings from efficiency measures installed in earlier years that may still be delivering savings. These would be best captured using a total annual savings or cumulative energy savings measurement. Doing so would provide a more comprehensive assessment of historical program performance but would not allow one to make meaningful comparisons of states' recent efforts.

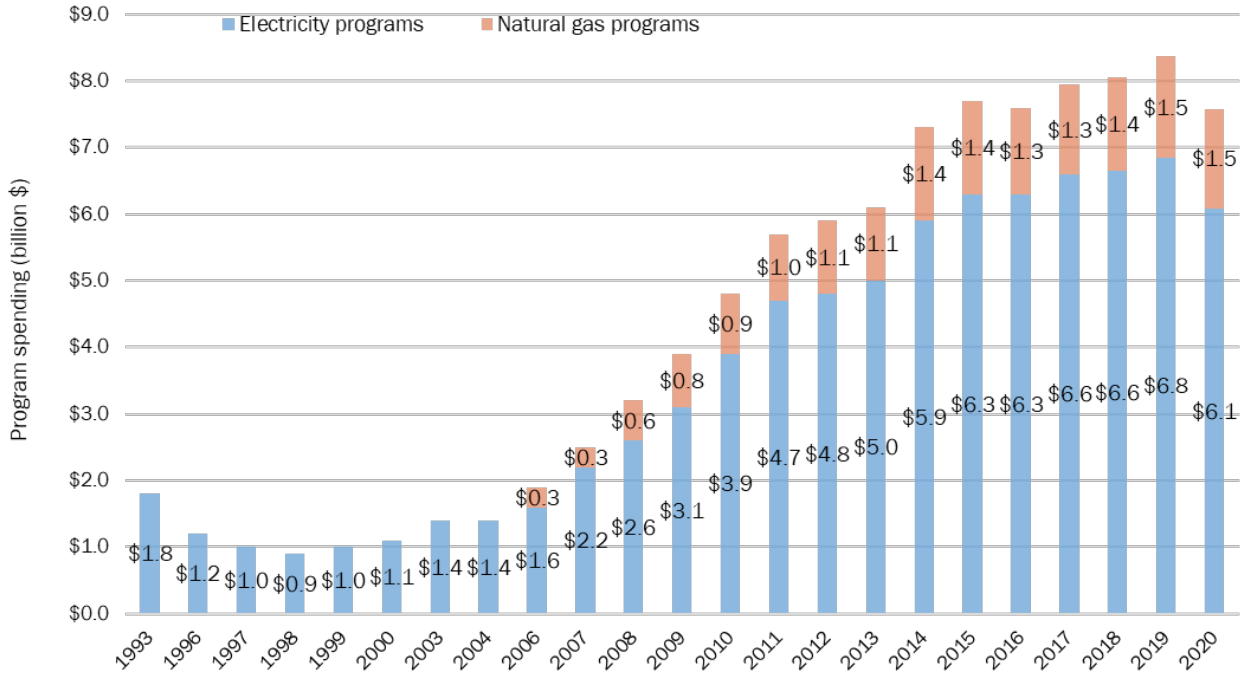

Figure 1. Annual electric and natural gas energy efficiency program spending. Natural gas spending is not available for 1993–2004. Sources: Nadel, Kubo, and Geller 2000; York and Kushler 2002, 2005; Eldridge et al. 2007, 2008, 2009; CEE 2012, 2013, 2014, 2015, 2016, 2017, 2018; Gilleo et al. 2015; Berg et al. 2016, 2017, 2018, 2019, 2020.

Nationwide reported savings from utility and public benefits electricity programs in 2020 totaled 0.72% of sales, or 26.6 million megawatt-hours (MWh), a 1.1% decrease from 2019. The global pandemic struck a heavy blow to programs in early 2020, temporarily forcing more than 600,000 people in the clean energy sector out of work, about 70% of whom were energy efficiency contractors (Jordan 2020). Overall impacts to programs seemed to vary among states, as legislators and programs took different steps to adapt and redirect or commit additional resources to maintain operations. Creative solutions included expanding programs to leverage online services such as virtual home energy assessments and shifting resources to measures with minimal or no direct customer contact. A Massachusetts program, for example, prioritized wall insulation and other measures that can be installed from the outside of buildings. Other utilities shifted some efficiency funds to schools and other large facilities temporarily vacant during the height of the pandemic. The School Indoor Air Quality Grant Program, created by the Vermont state legislature and funded through pandemic relief funds, supports schools with projects like repairing, maintaining, and upgrading HVAC systems in response to guidelines specific to COVID-19 from the U.S.

Centers for Disease Control and Prevention (CDC) and ASHRAE (Efficiency Vermont 2021). While many states reported lower savings in 2020, others, like New Jersey, New York, and Michigan, reported increases as programs grew to meet new efficiency targets adopted in recent years.

Despite the challenges of 2020, the total annual impact of efficiency programs continues to grow, since most efficiency measures generate savings for residents and businesses for years after they are installed. As figure 2 shows, the total impact of ratepayer-funded energy efficiency programs was a savings of about 286 million MWh in 2020: the 26.6 million MWh of incremental savings plus savings still accruing from measures implemented in prior years.[18] These large-scale savings are equivalent to approximately 7.69% of 2020 electricity consumption.

[18] Based on annual *State Scorecard* data as cited in figure 2; assumes an average measure life of 10 years.

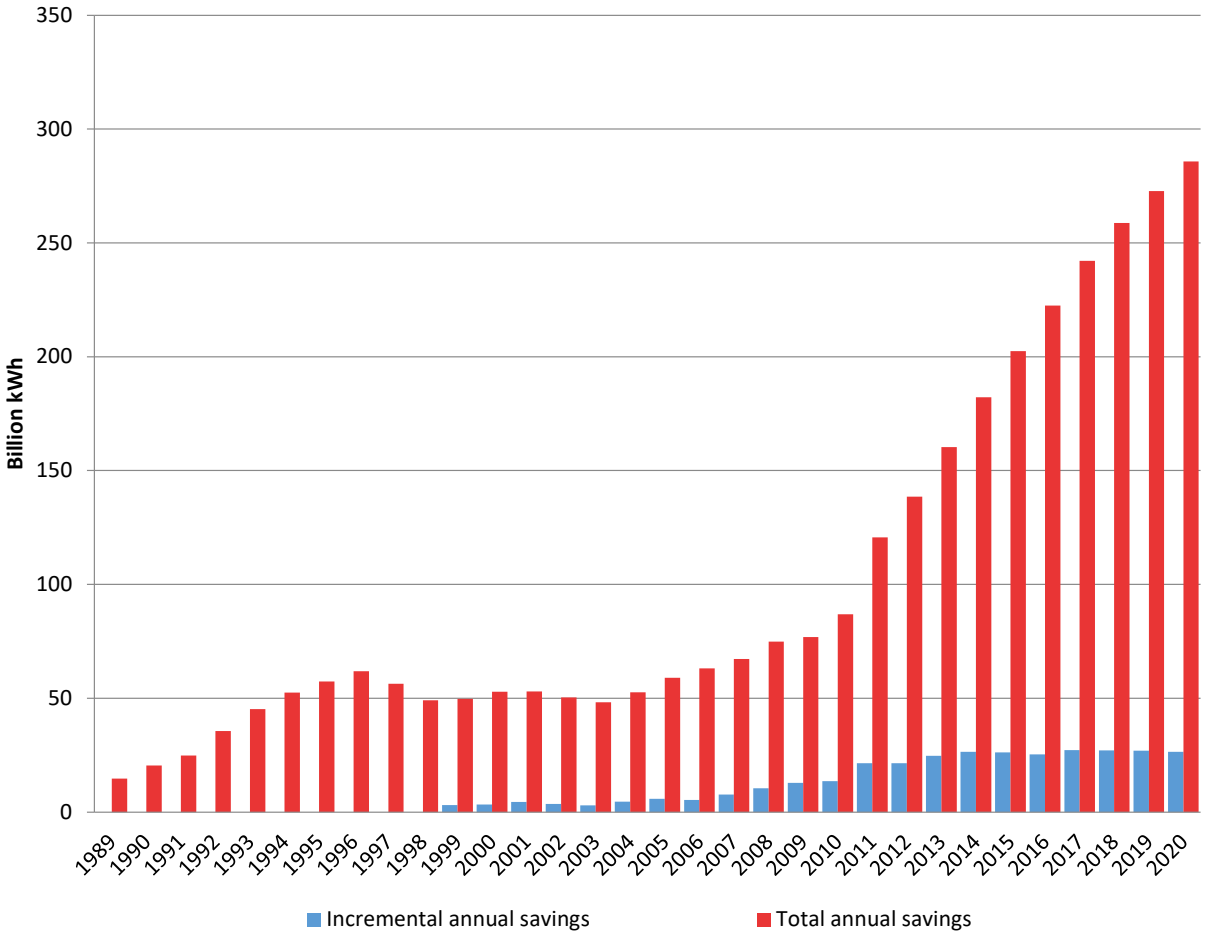

Figure 2. Electric savings from utility-sector energy efficiency programs, by year

Savings by State from Electricity and Natural Gas Efficiency Programs

Below, we track the overall performance of electricity and natural gas energy efficiency programs by the amount of energy saved. Utilities and nonutility program administrators pursue numerous strategies to achieve energy efficiency savings, which are then subject to internal or third-party evaluation, measurement, and verification (EM&V) and are typically reported to the public utility commission on a semiannual or annual basis.

We should note that while we consider electric and natural gas savings separately for the purposes of this report, our research has found that a handful of states—particularly those with aggressive clean energy and GHG reduction goals—have begun considering savings on a combined fuel-neutral basis, measured in total Btu energy savings (e.g., New York and

Massachusetts), GHG reductions (Sacramento Municipal Utility District, Massachusetts, and the District of Columbia), or total system benefit (California) (Specian and Gold 2021).[19] Such an approach allows states the flexibility to better account for savings from resources with competing GHG profiles. For instance, switching homes from fossil fuel heating to electric air-source heat pumps may increase electric demand, but it will also reduce overall energy use on a total Btu basis and lower GHG emissions in regions with a relatively high penetration of renewable energy resources. This approach to accounting is still in its infancy, but as more states prioritize beneficial electrification as a decarbonization strategy, we expect to see this practice become more commonplace and will adjust our *Scorecard* methodology as appropriate.[20]

Table 1 shows utility-reported electric savings by state. Nationwide, reported savings from utility and public benefits electricity programs in 2020 totaled 26.62 million MWh, equivalent to 0.72% of sales. This is approximately 1.1% less than the 26.93 million MWh (0.70% of sales) reported last year. Where no data for 2020 were available from state contacts, we used adjusted gross savings data reported by EIA (2021), to which we applied a net-to-gross

[19] In transitioning to an "apples-to-apples" fuel-neutral accounting of savings, it is important to distinguish between site and source energy. For the sake of simplicity savings are often expressed in terms of "site energy," or the amount of heat and electricity consumed by a building as reflected in its utility bills. However, expressing in terms of source energy provides a more accurate and holistic picture of total energy consumed by accounting for total raw fuel on the supply side, including plant losses and line losses that occur before electricity reaches the customer. This more comprehensive accounting is important for accurately comparing the relative benefits of different demand-side solutions. For example, source energy calculations can provide a more accurate reflection of savings from combined-heat and power (CHP), which acts more like a generation asset and should be compared with electricity-producing generation fuels that are displaced. Expressing savings in terms of source energy can also better reflect savings from electrification measures, which will vary depending on the relative proportion of thermal generation on the grid.

[20] Among the states currently measuring savings on a total MMBtu (million Btu) basis are Massachusetts, Wisconsin, and New York, although no states have yet abandoned fuel-specific electric and natural gas goals for an exclusively fuel-neutral goal.

calculation in order to compare these figures with other net-reported savings from states.[21,22]

Table 1. 2020 net incremental electricity savings by state

State	2020 net incremental savings (MWh)	% of 2020 retail sales	State	2020 net incremental savings (MWh)	% of 2020 retail sales
Massachusetts	1,168,304	2.34%	Delaware	66,310	0.60%
Rhode Island	157,346	2.14%	North Carolina	717,619	0.55%
Maryland	1,144,994	1.99%	Indiana	492,539	0.51%
Vermont	104,971	1.97%	Missouri†‡	369,227	0.49%
California†	4,484,238	1.79%	Oklahoma	297,836	0.48%
Illinois	2,182,379	1.65%	Iowa†‡	225,909	0.45%
New York	2,297,264	1.64%	Montana	63,721	0.44%
Michigan	1,580,293	1.63%	South Carolina*†	295,257	0.38%
Minnesota†	829,090	1.29%	Wyoming†	52,522	0.34%
Arizona†	1,045,524	1.28%	South Dakota†	29,535	0.23%
District of Columbia	112,103	1.15%	Texas†‡	913,686	0.21%
Hawaii	97,288	1.11%	Georgia†	202,020	0.15%

[21] We applied a net-to-gross (NTG) factor to all states reporting only gross electric savings. In this case, the NTG factor was 0.839, based on states that reported figures for both net and gross electric savings in our most recent data request. These were New York, Connecticut, Maryland, Massachusetts, Missouri, Delaware, Pennsylvania, Oklahoma, Utah, North Carolina, Wisconsin, Nevada, California, and New Mexico.

[22] It should be noted that states use different methodologies for estimating energy savings, and this can produce inequities when making comparisons. A state's EM&V process plays a key role in determining how savings are quantified. This is particularly true of a state's treatment of free ridership (savings attributed to a program that would have occurred even in the absence of the program) and spillover (savings not attributed to a program that would not have occurred without it). States report energy savings as either net or gross, with net savings accounting for free riders and spillover, and gross savings not accounting for these. The *State Scorecard* specifically focuses on net savings.

Ohio*†	1,550,943	1.09%	Kentucky*†	101,767	0.14%
Utah	336,880	1.06%	Nebraska*†	39,088	0.13%
New Hampshire	110,764	1.04%	Louisiana*†	111,328	0.12%
New Jersey†	712,568	0.99%	Virginia*†	145,572	0.12%
Maine†	111,467	0.98%	Mississippi*†	51,434	0.11%
Colorado†‡	524,980	0.94%	Florida†	148,956	0.06%
Connecticut	249,734	0.92%	Tennessee	44,115	0.05%
Washington*†	736,625	0.85%	Alabama*†	13,368	0.02%
Idaho*†	201,944	0.83%	West Virginia	4,384	0.01%
Arkansas	357,178	0.78%	Alaska*†	168	0.00%
Nevada	264,324	0.69%	North Dakota*†	352	0.00%
Pennsylvania	964,437	0.69%	Kansas*†	77	0.00%
Oregon†	328,917	0.64%	U.S. total	26,618,095	0.72%
Wisconsin	426,465	0.63%	Median	225,909	0.63%
New Mexico	150,286	0.61%			

Savings data are from public service commission staff unless otherwise noted. Sales data are from EIA Form 861 (2021). * For states where we were unable to obtain savings data from commission staff, we relied on 2020 adjusted gross savings data from EIA-861 (2021). † At least a portion of savings were reported as gross. We adjusted the gross portion by a net-to-gross factor of 0.839 to make it comparable with net savings figures reported by other states. ‡ Includes both state-reported investor-owned utility data and some portion of EIA-reported savings for municipal utilities and co-ops.

Utilities are increasing the number and size of natural gas programs in their portfolios. However, data on savings resulting from these programs are still limited. In this category we relied on data from state utility commissions.

Consistent with the methodology we adopted in 2018 for tracking heating fuel efficiency, we combined natural gas data with data for consumption and savings associated with the most widely used unregulated fuels into a single thermal fuels energy savings metric. This

approach is a consistent way to measure energy efficiency efforts and performance across states with different fuel mixes and policies.[23]

To integrate unregulated fuels, we collected 2020 savings data on fuel oil, kerosene, propane, and wood from public service commissions and added these to the natural gas savings reported for each state. Similarly, we obtained consumption data by state for each fuel type from the EIA and combined this with natural gas sales for residential and commercial customers. We converted all energy units to MMBtus and divided savings by sales to create the common metric. Table 2 shows state data for natural gas and unregulated fuel program savings.[24] Appendix A includes separate natural gas–specific data for 2020 savings as a percentage of 2020 residential and commercial natural gas sales.

[23] Previously, direct comparison of natural gas savings as a percentage of sales across states was complicated by the varying percentage of customers with access to natural gas, incomplete data on unregulated fuels, and varying levels of energy efficiency program funding based on regulated energy sources. These issues are most common in the Northeast, where some states have a larger share of residential and commercial customers using fuel oil and other unregulated fuels for heating.

[24] As we did with electric savings, we applied a net-to-gross (NTG) factor to all states reporting only gross natural gas savings. In this case, the NTG factor was 0.867, based on states that reported figures for both net and gross natural gas savings in our most recent data request. These were California, Connecticut, Delaware, Indiana, Maryland, Massachusetts, New Mexico, New York, Oklahoma, and Wisconsin.

Table 2. 2020 natural gas and fuel efficiency program savings

State	2020 net incremental natural gas and fuel savings (MMBtu)*	% of 2019 commercial and residential retail sales**
California	15,962,390	1.94%
Michigan	6,419,597	1.09%
Minnesota*	2,840,188	0.89%
Massachusetts‡	2,693,796	0.77%
Utah	1,020,000	0.75%
District of Columbia	211,659	0.74%
Arkansas	740,103	0.71%
Rhode Island	319,000	0.66%
Wisconsin	1,680,000	0.52%
Illinois	3,530,000	0.52%
Oregon*	623,730	0.51%
Delaware‡	132,714	0.38%
Oklahoma	460,000	0.36%
New Jersey*	1,508,592	0.36%
New York‡	3,368,636	0.34%
Maryland	636,900	0.33%
Connecticut	604,160	0.33%
New Hampshire*‡	265,205	0.32%
Vermont‡	167,765	0.30%
Colorado	727,480	0.30%
Indiana	675,945	0.25%
Washington*	493,674	0.23%
Arizona*	216,745	0.23%
New Mexico	153,499	0.17%
Nevada	50,026	0.06%
Montana	45,936	0.06%
Florida*	60,934	0.06%
Pennsylvania*	193,685	0.04%
South Dakota*	7,025	0.02%
Alabama	-	0.00%
Alaska	-	0.00%
Georgia	-	0.00%
Hawaii	-	0.00%
Idaho	-	0.00%
Kansas	-	0.00%
Kentucky	-	0.00%
Louisiana	-	0.00%
Mississippi	-	0.00%
Missouri	-	0.00%
Nebraska	-	0.00%
North Dakota	-	0.00%
Ohio	-	0.00%
South Carolina	-	0.00%
Tennessee	-	0.00%
Texas	-	0.00%
Virginia	-	0.00%
West Virginia	-	0.00%
Wyoming	-	0.00%

Maine*‡	127,915	0.13%	U.S. total	46,274,814	0.44%
Iowa*	202,116	0.12%	Median	135,400	0.12%
North Carolina	135,400	0.08%			

Savings data were reported by contacts at public utility commissions, unless otherwise noted. **All sales data are from EIA (2021d) and EIA's State Energy Data System (SEDS) (EIA 2021f). * At least a portion of natural gas savings were reported as gross; We adjusted the gross portion by a net-to-gross factor of 0.867 to make it comparable with net savings figures reported by other states. ‡ These states reported some level of unregulated fuel savings.

Electricity and Natural Gas Efficiency Program Funding by State

ACEEE continues to track electricity and natural gas efficiency program spending on customer-funded energy efficiency programs. These programs are funded through charges on utility customers' bills.[25] Our data include spending by investor-owned, municipal, and cooperative utilities; public power companies or authorities; and public benefits program administrators. We did not collect data on federal grant allocations received by states through the DOE Weatherization Assistance Program. We do include revenues from the Regional Greenhouse Gas Initiative, which contributes to customer-funded energy efficiency program portfolios of member states, and two energy efficiency programs funded through AB 32 and Proposition 39 in California.[26]

For states that did not provide data for 2020 spending on energy efficiency programs for electric or natural gas utilities, we used expenditure data from EIA-861 or information supplied by our state contacts in their 2020 utility data request responses. As in past years, we sent spending data gathered from the above sources to state utility commissions for review. Table 3 shows state-level spending on electric efficiency programs.

[25] Some of these programs target unregulated fuels or are fuel blind to household heating sources. Spending for this type of program is typically captured in our electric efficiency spending metric.

[26] AB 32 is California's GHG reduction bill that resulted in a cap-and-trade program. Proposition 39 grants significant funding to energy efficiency programs targeting schools. Both programs are subject to evaluation, measurement, and verification at least as stringent as the EM&V for utility programs.

Table 3. 2020 electricity efficiency program spending by state

State	2020 elec. spending ($ million)	% of 2020 statewide elec. revenues
Vermont†[1]	66.1	7.6%
Rhode Island†	88.2	6.5%
Massachusetts†	585.0	6.4%
Maryland	249.5	3.9%
New Hampshire†	62.5	3.5%
Oregon	157.6	3.5%
Connecticut†[2]	172.5	3.3%
Maine†[3]	49.9	3.2%
New York†[4]	660.1	3.2%
Illinois	387.6	3.0%
Idaho*	53.6	2.7%
Washington*	192.9	2.7%
Michigan	294.3	2.5%
Minnesota	166.5	2.5%
Utah*	57.7	2.2%
California	930.6	2.1%
Hawaii	49.5	2.0%
Delaware†	20.6	1.8%
New Jersey	176.0	1.8%
Arkansas	67.4	1.8%
Colorado	95.9	1.7%
New Mexico	33.9	1.5%
Oklahoma	69.2	1.5%
Pennsylvania	186.8	1.4%
Nevada	43.6	1.4%
Missouri	95.0	1.3%
Ohio*	164.8	1.2%
Arizona	99.3	1.2%
District of Columbia	13.3	1.1%
Wyoming	14.4	1.1%
Iowa	44.1	1.0%
North Carolina	113.2	0.9%
Indiana	82.8	0.9%
Wisconsin	62.4	0.9%
Montana	11.4	0.9%
South Carolina*	49.2	0.6%
Texas	182.3	0.5%
Georgia	54.7	0.4%
Florida	92.3	0.4%
South Dakota	4.8	0.4%
Virginia*	37.3	0.3%
Louisiana*	22.4	0.3%
Mississippi*	10.6	0.2%
Nebraska	6.9	0.2%
Tennessee	10.1	0.1%
Kentucky*	5.6	0.1%
West Virginia	2.0	0.1%
Alabama*	3.8	0.0%
North Dakota*	0.1	0.0%
Kansas*	0.2	0.0%
Alaska*	0.0	0.0%
U.S. total	**6,100.4**	**1.55%**
Median	**62.4**	**1.30%**

2020 statewide revenues are from EIA Form 861 (EIA 2021a). * Where 2020 spending was not available from states, we substituted 2020 spending as reported by EIA-861 (EIA 2021a). † Includes some spending on unregulated fuel efficiency programs. [1] Includes $21.6 million toward propane/heating oil programs. [2] Includes $16.3 million toward propane/heating oil savings. [3] Includes $7.3 million toward oil/propane/kerosene efficiency. [4] Includes $4.3 million toward propane/heating oil programs.

We also tracked natural gas efficiency program spending by state in 2020, with data gathered from a survey of state utility commissions and independent statewide administrators. To directly compare spending data among the states, we normalized spending by the number of residential natural gas customers in each state in 2019, as reported by EIA (2020b).[27]

After a significant uptick in 2014, natural gas program spending levels have remained relatively flat in recent years. In 2020 spending totaled $1.5 billion, comparable to levels reported in 2018 and 2019. Natural gas efficiency spending remains significantly lower than spending for electricity energy efficiency programs. Table 4 shows natural gas efficiency spending by state.

[27] We used spending per residential customer for natural gas because reliable natural gas revenue data are sparse, and use of per capita data unfairly penalizes states that offer natural gas service to only a portion of their population (such as Vermont). State data on the number of residential customers are from EIA (2021b).

Table 4. 2020 natural gas efficiency program spending by state

State	2020 gas spending ($ million)	$ per 2020 residential customer
Massachusetts	252.6	135.38
Rhode Island	24.6	99.42
New Hampshire	10.7	95.23
Connecticut	46.7	80.94
Vermont	3.4	71.22
District of Columbia	7.5	48.37
Minnesota	63.2	39.94
New Jersey	112.0	39.01
Michigan	127.1	37.91
Delaware	6.9	36.98
Oregon	28.2	36.24
Florida	27.5	33.75
California	373.5	33.39
New York	130.2	28.63
Utah	28.5	28.47
Arkansas	15.8	27.98
Washington	28.0	22.73
Illinois	80.4	20.31
Maine	0.7	19.06
Oklahoma	17.1	17.78
Colorado	20.9	11.33
New Mexico	6.4	10.55
Iowa	9.5	10.01
Maryland	10.6	8.91
Wisconsin	15.5	8.56
Idaho	3.7	8.53
Indiana	14.5	8.05
Montana	1.6	5.59
Missouri	7.7	5.33
Pennsylvania	11.8	4.15
Arizona	5.1	3.91
South Dakota	0.2	1.01
Nevada	0.9	0.96
North Carolina	0.8	0.60
Alabama	-	-
Alaska	-	-
Georgia	-	-
Hawaii	-	-
Kansas	-	-
Kentucky	-	-
Louisiana	-	-
Mississippi	-	-
Nebraska	-	-
North Dakota	-	-
Ohio	-	-
South Carolina	-	-
Tennessee	-	-
Texas	-	-
Virginia	-	-
West Virginia	-	-
Wyoming	-	-
U.S. total	1,493.5	
Median	6.4	

Spending data provided by public service commission staff. Natural gas residential customer data from EIA 2021e.

Regional Highlights from State Utility Policies and Programs

As states emerged from the initial worst waves of the pandemic that slowed policy efforts throughout much of 2020, lawmakers and regulators hit the ground running in 2021 on a wide range of clean energy initiatives, with several adopting strengthened climate goals to slash emissions across the utility sector.

Northeast

Many Northeast states, consistently among the top ranked in the *Scorecard*, continued to innovate with important regulatory reforms to pair efficiency and building electrification in order to deliver greater carbon benefits. Many of these states also successfully responded to pandemic-related disruptions with creative solutions to help sustain programs. These included shifting resources to virtually delivered services (such as online energy marketplaces and virtual home energy assessments). State officials in New York developed guidelines to coordinate free online training opportunities for clean energy contractors. Programs in Massachusetts adapted offerings to focus on wall insulation measures that could be installed externally and other work outside customer-occupied areas. Some states and utilities also increased funding and incentive levels in underserved communities facing affordability challenges to ensure participation in areas most impacted by the crisis (York 2020).

Massachusetts delivered among the most far-reaching and talked about climate bills in 2021 with S.9, An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy. This legislation adopted a new 2050 net-zero emissions target, with incremental five-year targets and subsector performance goals. Among the bill's many provisions were technology adoption benchmarks for electric vehicles, charging stations, solar technology, energy storage, air-source and ground-source heat pumps, and anaerobic digesters. Additionally, the act requires the state secretary of Energy and Environmental Affairs (EEA) to set a GHG reduction goal for each subsequent three-year energy efficiency plan in Massachusetts. On November 1, 2021, program administrators filed final plans for 2022–2024 with the Department of Public Utilities for review to align with GHG reduction goals set by the EEA secretary, marking the first utility energy efficiency resource standard set to state climate goals (Massachusetts DOER 2021a).

Work continued across multiple clean energy fronts in **New York** in pursuit of the state's goals to decarbonize the electricity sector by 2040 and achieve economy-wide carbon neutrality by 2050. Driven by a January 2020 regulatory order setting new utility savings targets and approving an initial $2 billion in funding, efforts have been ongoing to ramp up

efficiency and building electrification programs to meet the statewide 185 TBtus savings goal for 2025. To ensure that clean energy investments are inclusive of all customers, the state is designing these programs to deliver a minimum of 35% of benefits (with a goal of 40%) to disadvantaged communities. Through the NYS Clean Heat Program, the New York State Energy Research and Development Authority (NYSERDA) has also earmarked more than $230 million for workforce training, heat pump initiatives for low- and middle-income customers, performance improvements and testing, support of the heat pump supply chain, community engagement, and development of a buildings electrification road map to help transform how New Yorkers heat and cool buildings.

New Jersey's ongoing mission to transform its energy efficiency industry marked a major milestone in June 2021 when it finalized new energy efficiency programs from all of the state's energy utilities. These programs are expected to invest at least $1.6 billion over the next three years, spurred by the state's 2018 Clean Energy Act and landmark 2020 Board of Public Utilities (BPU) order, which established robust annual savings targets for electric and natural gas use, and a regulatory framework that includes a new performance-based recovery mechanism and strengthened stakeholder engagement processes. Launched in April 2021, the BPU's four working groups, which will address equity, workforce development, EM&V, and marketing, will shape the future of programs for years to come.

MIDWEST

Minnesota's long-proposed Energy Conservation and Optimization Act won passage through the state legislature and was signed into law in May 2021, marking a major victory for efficiency advocates and opening important doors for efforts to scale up beneficial electrification. The ECO Act strengthens the state's energy efficiency resource standard with higher savings targets and expands the scope of measures eligible for efficiency incentives to include cost-effective load management and fuel switching. The state is currently determining next steps for implementation of the new statutory requirements. The state also passed the Natural Gas Innovation Act (NGIA) in early summer to encourage emerging natural gas decarbonization measures and technologies. The NGIA establishes a new regulatory framework whereby natural gas utilities can implement and recover costs from a variety of GHG-reducing resources, such as biogas, hydrogen or ammonia produced using carbon-free electricity, carbon capture, strategic electrification, district energy, and energy efficiency.

In **Michigan**, policymakers worked to advance utility reforms and climate policies across multiple fronts under MI Power Grid, a multiyear stakeholder initiative to integrate new clean

energy technologies and optimize grid investments. The Michigan Public Service Commission (MPSC) released a one-year status report in October 2020 capturing the achievements of the state's multiple work groups, which have drafted rules addressing interconnection standards, issued recommendations related to grid security and reliability issues, and made proposals for improving DR performance. The initiative's second phase has focused on integration of resource, distribution, and transmission planning activities per an August 2020 MPSC order directing upcoming utility distribution system plans to contain a robust consideration of energy efficiency and asking that future integrated resource plans coordinate inclusion of public health and environmental justice considerations (Michigan PSC 2020). These efforts are also ongoing in coordination with Governor Gretchen Whitmer's MI Healthy Climate Plan and Council on Climate Solutions, created under Executive Directive 2020-10 and Executive Order 2020-182, respectively, to develop new clean energy jobs and put the state on a path to achieve carbon neutrality by 2050 (Michigan Office of the Governor 2020b, 2020a).

In **Illinois**, Governor J. B. Pritzker in September signed the **Climate and Equitable Jobs Act** (CEJA), which lays out profound changes to the state's power sector and a goal to achieve 100% carbon-free electricity by 2045. Among CEJA's legislative changes are an extension of the state's cumulative persisting annual savings targets beyond 2030 and replacement of the previous efficiency program exemption for large customers with an opt-out provision, opening the door for their future participation in programs. CEJA also strengthens investments in low-income programs and creates a health and safety fund for needed repairs to buildings occupied by low-income households.

For the latest on Midwest state policy activity, the Michigan Energy Efficiency Alliance's Policy Insider provides monthly regional updates (MEEA 2021).

SOUTHEAST

The last few years have brought a raft of new legislation in **Virginia** that is gradually positioning the state as a climate leader in the Southeast. In the wake of the 2020 signing of the Virginia Clean Economy Act (VCEA), which established a goal to decarbonize the power sector by mid-century, policymakers were busy hammering out regulatory details in 2021 to move key provisions of the legislation into action. This has included an ongoing utility proceeding on EM&V, leading to an October 2021 State Corporation Commission (SCC) decision that adopts a new EM&V framework and corresponding principles to ensure that efficiency programs are accurately measured. The decision also sets requirements for an annual progress dashboard and directs SCC staff to participate in stakeholder proceedings.

The 2021 legislative session also delivered several important follow-up bills designed to implement the VCEA, including SB 1282, requiring Virginia to conduct a statewide baseline and projection inventory of all GHG emissions, with updates every four years. And following the state's 2020 admission into the RGGI (making it the first Southeast state to join), a public stakeholder process convened in 2021 to guide investment of Virginia's first round of carbon market revenues. Half of these funds, roughly $21 million, has been committed to energy efficiency programs for low-income households (McGowan 2021).

Building on 2019 state Clean Energy Plan (CEP) efforts, **North Carolina** stakeholders convened the North Carolina Energy Regulatory Process (NERP) throughout 2020. Activity included nine workshops and additional study group meetings to consider updates to utility regulations and electricity market structures, in line with CEP goals to reduce power sector GHG emissions 70% by 2030 and attain carbon neutrality by 2050 (Brooks et al. 2020). The state utilities commission (NCUC) also approved important changes that may encourage additional energy efficiency, such as a new performance incentive for achieving savings goals, including separate goals for the low-income sector. Also, Duke Energy has initiated an Affordability Collaborative as a result of recent general rate cases (Docket Nos. E-7 Sub 1214 and E-2 Sub 1219). This effort involves many stakeholders and is charged with looking at the impact of retail rates for utility service on low-income customers. In addition, the state took an important first step during the summer toward potentially becoming the second Southeast state to join RGGI when the state's Environmental Management Commission granted approval to begin exploring RGGI through notice and comment rulemaking.

WEST

In May utility regulators in **California** published important and transformative rules reorienting the state's energy efficiency regulations to better value and pursue the broad range of benefits from energy savings, including a greater emphasis on reducing carbon emissions (CPUC 2021). Introducing a new "total system benefit" metric, the new valuation approach encourages a closer consideration of "high value" load reductions and longer-duration energy savings intended to optimize capacity savings and GHG benefits. In addition to better valuing efficiency as a grid and decarbonization resource, this will help bring programs into closer alignment with ambitious state goals established under SB 350 (2015) to double efficiency savings by 2030. The CPUC decision also importantly removes the siloing of resources like energy efficiency, storage, and demand response, enabling them to work in concert to provide greater grid benefits, and it reorganizes portfolios to protect and encourage programs that address equity and provide market support for efficiency programs (CPUC 2021). Also in California, 2021 marked the launch of the first phase of the

state's $120 million Technology and Equipment for Clean Heating program, which aims to stimulate the market for low-emission space- and water-heating technologies such as heat pumps by working "upstream" with manufacturers, distributors, and vendors, and through consumer education and contractor training.

Oregon also made major strides in 2021. In passing HB 2021, it adopted one of the most ambitious state decarbonization timelines, aiming to eliminate carbon emissions from the state's power sector by 2040. Regulated entities, including the state's two largest investor-owned utilities and retail electricity service suppliers, are required to submit plans to reduce emissions 80% by 2030 and 90% by 2035 (Oregon Legislative Assembly 2021a). While this legislation received the most national attention, stakeholders also delivered multiple other energy laws that will help alleviate customer energy burdens at a time when many are still reeling from pandemic-related economic challenges. These include the Energy Affordability Act (HB 2475), which gives the state Public Utility Commission (PUC) the authority to enable utilities to consider income and other economic, social equity, or environmental justice factors in determining customer energy rates. It also potentially helps strengthen representation among historically marginalized communities by calling for a process to provide financial assistance to groups participating in PUC regulatory proceedings (Oregon Legislative Assembly 2021b). HB 3141, another energy equity bill signed in 2021, directs the PUC to set equity metrics for Energy Trust of Oregon funds and to increase weatherization funding for low-income customers. In addition, the legislation streamlines the energy efficiency planning process by moving efficiency funds from the public purpose charge into the standard rate-making process (Oregon Legislative Assembly 2021d). Other legislation, HB 2739, increased funds for the bill payment assistance program for customers with low incomes (Oregon Legislative Assembly 2021c).

Washington, building on 2020 legislation establishing a 2050 goal to achieve net-zero emissions, followed up in 2021 by passing the Climate Commitment Act (CCA), a cap-and-invest law that puts an enforceable, declining limit on all major sources of GHG emissions across the economy. A mechanism for auctioning and trading emissions credits is due in January 2023, with revenues going toward climate and transportation projects. The law also includes several important measures to address environmental justice issues, such as requirements to assess pollution and health impacts in overburdened communities and take further action to address identified inequities. It also requires that at least 35% of funding from the CCA go toward providing benefits to vulnerable populations, with 10% of investments going to benefit Indigenous tribes.

In **Hawaii**, utility regulators have made significant progress in developing one of the most advanced performance-based ratemaking (PBR) approaches in the nation. In December 2020, the state Public Utilities Commission issued a decision and order approving the new PBR framework, continuing its transition away from a traditional cost-of-service regulatory model to one that determines rates on the basis of utility fulfillment-of-performance metrics related to state clean energy goals and a mandate to reach zero-carbon energy by 2045. The decision was the culmination of more than two and a half years of collaboration among utilities, local governments, clean energy companies, and environmental groups. New performance incentive mechanisms (PIMs) include an accelerated renewable portfolio standard (RPS-A) and PIMs designed to reward more effective low- and moderate-income energy efficiency programs, speed smart meter deployment and distributed energy interconnections, and promote distributed energy resource asset effectiveness and grid investment efficiency (Hawaii PUC 2021).

SOUTHWEST

A cluster of major energy laws signed in **Colorado** in 2021 delivered important reforms supporting state decarbonization goals by promoting building electrification and strengthening efficiency in the natural gas sector. One of these, SB21-264, requires gas distribution utilities to file a clean heat plan with the state PUC, including strategies to deliver 4% GHG emissions reductions by 2025 and 22% by 2030 through the use of clean heat resources such as electrification and natural gas demand-side management (DSM). Another, HB21-1238, establishes a process to set natural gas savings targets paralleling a similar process already in place for electric DSM programs; it also updates methods for determining cost effectiveness by incorporating social costs of GHGs (carbon dioxide and methane) and adjusting discount rates to accurately value the future gas savings benefits to ratepayers. Additionally, SB21-246, also signed in 2021, will directly promote building electrification by requiring energy savings targets for programs that replace fossil fuel–based heating with energy-efficient electric equipment.

Nevada also delivered an eventful legislative session in 2021, packed with sweeping energy reforms. These included the New Energy Economy Act, SB 448, which contains updates strengthening regional electric grid planning, expanding EV charging infrastructure, and doubling energy efficiency funding for low-income customers and public schools in underserved communities (Nevada Legislature 2021b). These bills build on and support the state's goals, signed in 2019, to source half its electricity from renewable energy by 2030 and achieve a 100% carbon-free grid by 2050 (Nevada Legislature 2019).

In **Arizona**, following years of collaboration and input from utilities and advocates, proposed clean energy rules suffered a disappointing end at the hands of the state Corporation Commission, which voted 3-2 to reject the rules package in late January 2022. The Rules had included a 100% clean electricity standard as well as an important 10-year extension of the state's energy efficiency resource standard which has saved ratepayers more than $1.4 billion over the past decade while supporting more than 40,000 jobs in recent years. However in the wake of the failed vote, the future of these cost-saving programs and the local jobs they support are now uncertain. It now remains to be seen whether regulators will revisit elements of the proposed rules package such as efficiency in separate rulemakings.

Energy Efficiency Resource Standards

Energy efficiency targets for utilities, established by energy efficiency resource standards (EERS), are critical to encouraging savings over the near and long terms. States with an EERS policy in place have shown average energy efficiency spending and savings levels approximately four times as high as those in states without such a policy (ACEEE 2019). Savings from states with EERS policies in place accounted for approximately 80% of all utility savings reported across the United States in 2019 (Gold, Ungar, and Berg 2021). As of this writing, 25 states and the District of Columbia had EERS policies with mandatory multiyear savings targets.[28] This updated count—down from 27 last year—reflects a November 2021 decision by the New Hampshire Public Utilities Commission that effectively dismantled the state's EERS and dramatically scaled back energy efficiency programs. This also reflects the Arizona Corporation Commission's January 2022 vote to reject proposed clean energy rules that would have established a 100% carbon-free electricity standard and also would have extended and expanded the state's energy efficiency resource standard.

EERS policies set targets for electricity or natural gas savings, such as 1% or 2% incremental savings per year or 20% cumulative savings by a future target.[29] They differ from state to

[28] *Multiyear* is defined as spanning three or more years. EERS policies may set specific targets as a percentage of sales, as specific gigawatt-hour energy savings without reference to sales in previous years, or as a percentage of load growth.

[29] Some states require all cost-effective efficiency. These are California, Connecticut, Maine, Massachusetts, Rhode Island, Vermont, and Washington. Connecticut sets budgets first, then achieves all cost-effective efficiency within that limit, which is a lower savings target.

state, but each is intended to establish a sustainable, long-term role for energy efficiency in the state's overall energy portfolio.[30]

States are also increasingly seeking strategies to meet GHG reduction goals, for example through grid decarbonization and the electrification of buildings and vehicles. Redesigning EERS goals and establishing new targets can help meet multiple policy objectives in these cases. Examples include establishing peak demand targets, fuel-neutral goals, and specific GHG targets for efficiency programs.

Table 5 provides a list of states that currently have an EERS in place, the percentage of statewide electric sales covered by the policy, and the relative strength of each state's savings goal. To aid in comparing states, we estimated an average annual savings target over the period specified in the policy. For example, in a June 2020 order New Jersey's Board of Public Utilities called for electric savings targets of 1.1% beginning in 2022 and ramping up to 1.45%, 1.8%, and 2.15% in each subsequent year, translating to an average incremental savings target of 1.6% over that time span.

Table 5. State energy efficiency resource standards

State	% of electricity sales covered by EERS policy	Approximate average annual electric savings target for 2020–2025	Cost cap	Natural gas savings target
Massachusetts	85%	2.7%		•
New York*	100%	2.0%		•
Rhode Island	99%	2.0%		•
Illinois	89%	2.0%	•	•
Vermont	98%	1.7%		•
Colorado	56%	1.7%		•

[30] ACEEE considers a state to have an EERS if it has a policy in place that (1) sets clear, long-term (3+ years) targets for utility-sector energy savings, (2) makes targets mandatory, and (3) includes sufficient funding for full implementation of programs necessary to meet targets.

State	% of electricity sales covered by EERS policy	Approximate average annual electric savings target for 2020–2025	Cost cap	Natural gas savings target
New Jersey	100%	1.6%		•
Maryland*	97%	1.6%		
California*	73%	1.5%		•
Minnesota*	100%	1.4%		•
Hawaii	100%	1.4%		
Virginia	87%	1.2%		
Oregon*	61%	1.2%		•
Arkansas	50%	1.2%		•
Connecticut	93%	1.1%		•
Nevada	88%	1.1%		
Maine*	100%	1.0%		•
Michigan	100%	1.0%		•
New Mexico	69%	1.0%		
Iowa*	75%	0.9%	•	•
District of Columbia	100%	0.8%		
Wisconsin	100%	0.7%	•	•
Washington*	83%	0.7%		•
Pennsylvania	96%	0.6%	•	
Texas	74%	0.2%	•	
North Carolina	100%	Combined EERS/RPS		

*** For states reporting electric savings on a gross basis, a net-to-gross adjustment was applied to make them comparable with states reporting net savings. States with voluntary targets are not listed in this table. Targets in states with cost caps reflect the most recent approved savings levels under budget constraints.**

3. Equity in State and Utility Planning and Programs

An integral area of focus for ACEEE is the advancement of social equity principles in clean energy and efficiency planning, policy, and program design. Historically, energy efficiency initiatives have typically failed to adequately serve and represent marginalized groups, particularly low-income, economically distressed, and environmental justice communities. These individuals often face disproportionately high energy burdens, meaning they spend a larger percentage of their income on energy bills than do their counterparts (Drehobl, Ross, and Ayala 2020). Furthermore, their underrepresentation within clean energy policymaking and planning means that many of the benefits of these policies do not equitably reach all communities. High energy burdens impact physical and mental health, education, nutrition, job performance, and community development, and the effects will only worsen as climate change continues, leading to more indoor heat-related illnesses and death.

While earlier *State Scorecard*s have included a relatively limited selection of state policies specifically addressing low-income household program access, ACEEE research is actively seeking additional opportunities to recognize and highlight ways in which states can strengthen equity in energy planning, decision making, and clean energy job training.[31] As part of this effort, in 2020 ACEEE kicked off the Leading with Equity Initiative, which focuses on ensuring that equity concerns are front and center in all ACEEE *Scorecards* and that *Scorecard* leaders are also leading on equity. We are working with utilities, policymakers, and community leaders to identify and advance metrics that capture progress toward deployment of innovative and robust energy efficiency policies and programs focused on equity. These efforts are perhaps more important now than ever as states and local communities wrestle with the impact of the COVID-19 pandemic, which has been especially devastating for low-income households and communities of color. The benefits of energy efficiency, including job creation, reduced energy bills, and healthy buildings, are critical to a successful economic recovery.

Informed by findings from our equity-focused workshops, new *Scorecard* metrics proposed for next year will include a closer consideration of state efforts to strengthen community

[31] ACEEE has previously included some equity-focused metrics in past versions of the *State Scorecard*, specifically through tracking of low-income expenditures in the utilities chapter and the state administration of federal Low-Income Housing Tax Credits in the transportation chapter.

engagement processes, provide compensation for marginalized communities wishing to participate in energy proceedings, improve tracking of energy equity–related data, and ensure equitable distribution of clean energy benefits, including workforce development opportunities. In the sections that follow, we provide examples of these best-practice policies introduced by states in recent years.

Enhanced incentives and expanded investment for low-income households. Low-income households face unique barriers such as high upfront costs or lack of access to new electric technologies and appliances. Offering enhanced incentives and expanding investment can increase access for these households. For example,

- LD 1766 requires the state of **Maine** to install 100,000 additional high-efficiency heat pumps over five years (by 2025) and requires the State Housing Authority to include information in its annual planning process for low-income weatherization programs on targets and budgets related to the heat pump goal (LD1766 2019). In December 2020, the state released its new statewide climate action plan, including a 2030 goal for 130,000 homes to be equipped with one or two heat pumps and an additional 115,000 homes to have a whole-home heat pump system. The plan also calls for at least 15,000 new heat pumps in income-eligible households by 2025. In late 2021, Governor Janet Mills announced the state had installed 28,000 high-efficiency heat pumps over the prior year and was on track to meet its goal.
- **Virginia**'s Clean Economy Act, passed in 2020, increased utilities' proposed investment in energy efficiency programs serving low-income customers from 5% to 15% of total program spending (Virginia General Assembly 2020). Also per 2020 state legislation, 50% of funds generated by the state's recent entry into RGGI are to be directed toward low-income energy efficiency programs. This amounted to $21 million in fiscal year 2021, including $15.2 million for the Weatherization Deferral Repair Program and $5.9 million for the Affordable and Special Needs Housing Program.
- **Minnesota**'s ECO Act, signed in 2021, includes provisions strengthening low-income spending targets for electric and gas utilities.
- In **Illinois**, the legislature in September 2021 passed the Climate and Equitable Jobs Act, which contains an array of utility reforms to decarbonize the power sector by 2045. Included are increased low-income energy efficiency spending requirements, as well as provisions to ensure investment in multifamily programs, whole-building weatherization, and health and safety measures.
- As part of their 2022–2024 Energy Efficiency Plan filed in October 2021, **Massachusetts** utilities have proposed strengthening investment in income-eligible programs by setting specific goals for heat pump installations in low-income

households and developing an offering to facilitate deep energy retrofits in low-income multifamily housing. The 2022–2024 Plan also includes significantly increased investment and new incentives for moderate-income customers.

Specific statewide low-income needs assessment or equity study that includes geospatial analysis of underserved communities. Understanding where high household energy burdens exist can help states prioritize the areas that are most affected.

- The **Oregon** Housing and Community Services Department and Oregon State University have led research to determine the energy burden of low-income households by race and have developed an ArcGIS map detailing where the state can and should focus its efforts (Buylova 2021).
- The **Minnesota** Department of Commerce recently funded a study titled "Analysis of New or Modified Energy Efficiency Programs to Increase Energy Savings of Underserved Populations." The project's goal is to increase the efficacy of the Conservation Improvement Program (CIP) for all users by using culturally responsive best practices to make CIP more accessible for communities that are the most challenging to serve, including renters, low- and moderate-income households, and households of color. This project will engage underserved, high-needs Twin Cities communities in a co-creative process to identify their unique barriers to participation in energy efficiency programs and the ways in which they can best be served. It is expected that results from this study will be available sometime in 2022.
- The **New Jersey** Comfort Partners program, the low-income energy efficiency initiative comanaged by the Board of Public Utilities (BPU) and the state's investor-owned utilities, has begun a location-based eligibility pilot. This program uses census tract data to grant automatic eligibility to residents in low-income neighborhoods in order to reduce barriers related to traditional income verification and to increase participation across communities that may not have otherwise applied for these services.

Specific energy burden reduction goals. Setting specific energy burden reduction goals increases the likelihood that low-income households will get the help they need and allows states to track their progress in helping these households reduce their energy use.

- **Washington**'s Clean Energy Transformation Act (CETA) prioritizes low-income programs and funding for those with high energy burdens (>6% of household income). Utilities must also submit a biennial assessment report analyzing the effectiveness of programs (short term and sustained) to reduce energy burdens, outreach strategies including tribal consultation and language access, and the funding levels necessary to meet: (1) 60% of current energy assistance need, or an increase of 15% from 2018, by 2030; and (2) 90% of current energy assistance need

by 2050. Utilities are mandated to make progress on these goals as part of compliance with CETA (Washington State Legislature 2019).

- In **Oregon**, legislators passed the Energy Affordability Act (HB 2475) in 2021, giving the state utility commission authority to set differential rates that take into consideration energy burdens borne by low-income customers. The law also establishes a process to ensure that environmental justice organizations are eligible for financial assistance to participate in regulatory proceedings.

Commitment to strengthening engagement with environmental justice communities. Engaging with marginalized and environmental justice communities will help states better understand the needs of these communities and create appropriate strategies to assist them.

- In 2020 the **Massachusetts** Energy Efficiency Advisory Council created the Equity Working Group (EWG) to recommend priority actions to increase participation among moderate-income customers, renters and landlords, and customers with limited English proficiency. Membership of the EWG included program administrators and organizations representing environmental justice populations. In 2021 the EWG presented its recommendations to the full council to inform the utilities' 2022–2024 Three-Year Energy Efficiency Plan. Based on these recommendations, the three-year plan (submitted to the Massachusetts Department of Public Utilities for review on November 1, 2021) includes a commitment to new targets and metrics for tracking progress toward equity goals, including program participation, investment, and benefits as well as funding for municipalities and community organizations for outreach to historically underserved customers (Massachusetts EEAC 2021). The plan also includes a new shareholder performance incentive mechanism with specific goals for benefits delivered to environmental justice communities (Mass Save 2021b).
- As part of the ongoing energy efficiency transition in **New Jersey**, the state BPU has made equity a focal point of its programming. It has created an Equity Working Group and a Workforce Development Working Group to consider access, affordability, and participation in energy efficiency programing. Facilitated by the BPU's Office of Clean Energy Equity, the working groups include representation from nongovernmental and community organizations to provide insight into the specific barriers faced by low-income communities and communities of color. The groups' intent is to enable the state and utilities to make programmatic and policy decisions with real-time feedback from the impacted communities.
- In 2021 the **Michigan** Public Service Commission established an Energy Affordability and Accessibility Collaborative that seeks input from diverse stakeholders, including residents, nonprofits, utilities, and state agencies. Key areas of focus are defining *affordability* and how this intersects with the ratemaking process, strategies for streamlining the energy assistance process, and recommendations on tying energy

waste reduction to energy assistance. Based on its findings, the collaborative will develop a long-term data strategy and review of rule-based protections (Michigan PSC 2021).

- **Connecticut**'s Equitable Energy Efficiency (E3) Proceeding, launched in 2020 by the state Department of Energy and Environmental Protection (DEEP), continued to work with a wide range of stakeholders to identify barriers to participation and strategies to improve participation in its energy efficiency programs. Based on public comments, DEEP released Proposed Recommendations and Actions in May 2021 (DEEP 2021). These include using new metrics and goals to assess equitable distribution of funds, streamlining the eligibility process, strengthening outreach, and mitigating health and safety barriers to participation in programs, among other actions. Future phases of the proceeding will be designed to advance distributive, procedural, contextual, and corrective equity.
- During the summer in **Oregon**, legislators passed HB 3141 to modernize and extend the state's public purpose charge, the primary source of funding for Energy Trust of Oregon's energy efficiency and renewable energy programs. The legislation allocates 25% of funds to resources and technologies serving low- and moderate-income customers. The bill also directs the state utility commission to set equity-focused performance metrics to ensure accountability to environmental justice communities.

Table 6 shows the results of ACEEE's analysis of levels of ratepayer-funded spending on low-income energy efficiency programs for states that provided this information through the *Scorecard* data request. These amounts are distinct from bill assistance programs and refer specifically to initiatives designed to improve energy efficiency through weatherization and/or energy-efficient retrofit programs that include measures such as home energy assessments, insulation, and air sealing. These amounts are also separate from federal funding, such as federal WAP grant allocations. However, we do include in table 6 any utility or state funds deployed to support or supplement WAP programs or projects.

Table 6. State support of low-income energy efficiency programs

State	2020 utility spending on low-income energy efficiency programs	2020 additional state spending on low-income energy efficiency programs	2020 total low-income energy efficiency spending	2020 state spending on low-income programs per income-qualified resident*
Vermont	$4,253,087	$10,663,020[1]	$14,916,107	$108.88
New Hampshire	$12,889,512	$2,505,111[2]	$15,394,623	$70.94

State	2020 utility spending on low-income energy efficiency programs	2020 additional state spending on low-income energy efficiency programs	2020 total low-income energy efficiency spending	2020 state spending on low-income programs per income-qualified resident*
Massachusetts	$77,673,783	$5,589,770	$83,263,553	$61.13
Rhode Island	$11,232,710	$2,225,000	$13,457,710	$55.15
Pennsylvania	$90,374,321	-	$90,374,321	$30.07
Illinois	$85,397,116	-	$85,397,116	$29.89
Hawaii	$9,560,526	-	$9,560,526	$29.15
California	$299,794,576	$4,123,316[3]	$303,917,892	$28.62
Connecticut	$22,473,240	-	$22,473,240	$28.41
District of Columbia	$4,776,440	-	$4,776,440	$24.62
Michigan	$56,644,759	-	$56,644,759	$23.20
Maryland	$20,325,418	$5,700,000[4]	$26,025,418	$20.77
New Jersey	$26,225,413	-	$26,225,413	$14.89
New York	$72,140,106	-	$72,140,106	$14.20
Alaska	-	$2,552,511[5]	$2,552,511	$12.83
Oregon	$12,081,093	$13,813[6]	$12,094,906	$11.85
Minnesota	$13,017,169	-	$13,017,169	$11.00
Maine	$3,823,548	-	$3,823,548	$10.96
Washington	-	$5,506,559[7]	$5,506,559	$3.55
Missouri	$15,441,000	-	$15,441,000	$9.25
Colorado	$8,973,007	$2,312,944[8]	$11,285,951	$8.96
Oklahoma	$10,015,276	-	$10,015,276	$7.03
Utah	$2,033,644	$2,175,613[9]	$4,209,257	$6.52
Arkansas	$6,178,167	-	$6,178,167	$6.22
New Mexico	$4,934,689	-	$4,934,689	$5.87

State	2020 utility spending on low-income energy efficiency programs	2020 additional state spending on low-income energy efficiency programs	2020 total low-income energy efficiency spending	2020 state spending on low-income programs per income-qualified resident*
Iowa	$3,479,004	$135,000[10]	$3,614,004	$4.65
Delaware	$1,255,322	-	$1,255,322	$4.39
Montana	$1,326,037	-	$1,326,037	$4.21
Idaho	$1,715,763	-	$1,715,763	$3.49
Tennessee	$7,498,893	-	$7,498,893	$3.35
Nevada	$2,086,977	$431,064[11]	$2,518,041	$2.51
Indiana	$4,021,995	-	$4,021,995	$2.27
Nebraska	$846,000	-	$846,000	$1.63
South Carolina	$2,219,427	-	$2,219,427	$1.49
Mississippi	$1,609,611	-	$1,609,611	$1.35
West Virginia	$690,329	-	$690,329	$1.19
Florida	$3,580,751	$4,346,760[12]	$7,927,511	$1.13
North Carolina	$2,443,052	-	$2,443,052	$0.74
Virginia	$1,678,260[13]	-	$1,678,260	$0.96
Wisconsin	$818,882	-	$818,882	$0.65
Georgia	$2,129,435	-	$2,129,435	$0.63
Wyoming	$8,639	-	$8,639	$0.05
Kentucky	$5,278[14]	-	$5,278	$0.00
Alabama	-	-	-	$0.00
Arizona	-	-	-	$0.00
Kansas	-	-	-	$0.00
Louisiana	-	-	-	$0.00
North Dakota	-	-	-	$0.00
Ohio	-	-	-	$0.00

State	2020 utility spending on low-income energy efficiency programs	2020 additional state spending on low-income energy efficiency programs	2020 total low-income energy efficiency spending	2020 state spending on low-income programs per income-qualified resident*
South Dakota	-	-	-	$0.00
Texas	-	-	-	$0.00

*** 2020 low-income population based on number of residents below 200% of the federal poverty level, according to the U.S. Census Bureau and Bureau of Labor Statistics 2020 Current Population Survey Annual Social and Economic Supplement. [1] Vermont Weatherization Trust Fund. [2] WAP and LIHEAP. [3] Programming from cap-and-trade proceeds. [4] Strategic Energy Investment Funds directed toward Low-to-Moderate Income Energy Efficiency Program. [5] Alaska Housing Finance Corporation weatherization funds. [6] State Home Oil Weatherization Program. [7] Washington Deptartment of Commerce–funded programs: Weatherization Plus Health, DHP Pilot, Fuel-Switching Program, Community Energy Efficiency Program (CEEP). [8] Colorado Severance Tax—WAP. [9] Olene Walker Housing Loan Fund. [10] Green Iowa Americorps energy efficiency programs. [11] Home Energy Retrofit Opportunities for Seniors. [12] FDACS Office of Energy. [13] Dominion only. [14] TVA only.**

4. Building Energy Efficiency Policies

Buildings consume 75% of the electricity and 40% of the total energy used in the United States and account for 59% of all U.S. carbon dioxide emissions (EIA 2021d, 2021e, 2020b).[32] This makes buildings an essential target for energy savings and overall emissions reductions, especially since inefficient construction can lock in emissions for years to come. Mandatory building energy codes require a minimum level of energy efficiency for new residential and commercial buildings as well as major renovations and additions. Benchmarking and transparency policies also promote efficiency by informing building owners about their energy consumption. Policies encouraging energy rating and labeling of homes can help to further transform the market by enabling prospective buyers to make informed decisions about the true long-term energy costs they would be taking on.

Recent years have seen particular progress in strengthening efficiency in the newest editions of the International Energy Conservation Code (IECC) for residential and commercial buildings and ASHRAE Standard 90.1, which includes prescriptive and performance requirements often incorporated into the IECC commercial provisions. The 2021 IECC, developed in 2019 and informed by a broad coalition of organizations including city and state voting members of the International Code Council (ICC), is estimated to yield efficiency gains of 9.4% relative to the previous code version, according to a recent DOE analysis and determination (DOE 2021). The code also offers two new optional appendixes (the Zero Energy Home Appendix and the Zero Code Renewable Energy Appendix) to provide states and cities pathways to incorporate zero-energy performance requirements into their codes.

ASHRAE released its updated 90.1-2019 commercial building code in October 2019. The latest version of 90.1 includes new provisions to improve envelope efficiency, reduce air leakage, increase lighting controls, and improve pump efficiency. According to the final DOE determination issued in 2021, the 2019 code is close to 5% more energy efficient than the 2016 version (DOE 2021).

[32] From an analysis of 2018 totals from residential, commercial, industrial, and transportation end uses.

2021 CODE UPDATES

In 1974 Oregon adopted the first statewide energy code in the nation, followed in 1978 by California's Title 24 Building Standard. Several states (including Florida, New York, Minnesota, and Washington) followed with their own codes in the 1980s. During the 1980s and 1990s, the International Code Council® and the regional code development organizations that preceded it established the Model Energy Code (MEC), later renamed the International Energy Conservation Code.® Today most states use a version of the IECC for their residential buildings.

Following a busy 2020, in which the 2018 IECC was adopted or put into effect by several states including Delaware, New Jersey, Minnesota, New Mexico, New York, Nevada, Tennessee, and Vermont, a number of states made important moves to advance more-efficient codes in 2021, many with an eye toward evolving to a net-zero-energy construction code in coming years. States making notable improvements in 2021 included these:

- **Hawaii.** In December 2020, the Hawaii State Building Code Council adopted the 2018 IECC with state-specific amendments. The code took effect for state government buildings on December 14, 2021. Counties have until December 14, 2022 to adopt the code with their own amendments.
- **Maine.** In 2020 the Technical Codes and Standards Board completed its rulemaking to implement the 2015 IECC, which took effect in July 2021. The board also adopted the 2021 IECC as a code appendix serving as a statewide stretch code that municipalities may elect to adopt. This marked a notable improvement to the Maine's previously adopted 2009 IECC.
- **Nevada.** In July 2021, the 2021 IECC was adopted for residential buildings. While the code is not being enforced statewide, a significant number of local governments are moving forward with its adoption. Local governments are not allowed to adopt less efficient energy codes.
- **Oregon.** The 2021 Oregon Residential Specialty Code (ORSC) and Energy Efficiency Specialty Code (OEESC) went into effect in April 2021. The ORSC is a homegrown code based on the provisions of the IECC with Oregon amendments, which include additional requirements for envelope efficiency and equipment. The OEESC is based on ASHRAE Standard 90.1-2019 and includes Oregon-specific amendments. Governor Kate Brown's Executive Order EO 17-20 includes a requirement that residential construction achieve at least equivalent performance to that of the DOE Zero Energy Ready Home by October 1, 2023. The governor's more recent EO 20-04 goes further, requiring residential and commercial codes to improve 60% relative to those from 2006 by the year 2030. Work is set to begin in 2022 among statewide stakeholders to adopt the next edition of the ORSC in 2023.

- **Virginia.** Virginia's Uniform State Building Code was updated to incorporate 2018 IECC and ASHRAE 90.1-2016 energy efficiency provisions for commercial buildings, effective July 2021. In addition, the state passed HB2001 in 2021, strengthening the building performance standard for state and local government buildings to include EV charging infrastructure and features enabling the tracking of building energy efficiency and carbon emissions.

Several other states entered update cycles for their respective building energy codes in 2021 with a review of the 2021 IECC, with plans for its eventual adoption. These included Connecticut, Delaware, Illinois, Maryland, Massachusetts, New Jersey, New York, Vermont, Washington, and Wisconsin, as well as the District of Columbia.

ZERO-ENERGY BUILDINGS

At the same time, a number of states and communities took steps to move toward zero-energy standards for new and existing construction. These include zero-energy buildings (ZEBs), that is, buildings that produce at least as much energy as they use through a mix of energy efficiency and renewable energy technologies, and in some cases "zero-energy ready" buildings constructed to high-efficiency standards with floor and roof configurations, electric wiring, and panel capacity to accommodate future onsite renewable energy installations (Nadel 2020).

California, one of several states at the leading edge of these efforts, continued to make important strides to decarbonize its buildings sector in 2021 when it announced the adoption of the state's 2022 Building Energy Efficiency Standards. The code will be the first in the nation to include efficient electric heat pumps as a baseline technology, improving on the state's previous code that first introduced requirements for installation of solar energy systems in new homes. The code is set to go into effect in January 2023, after which it is expected that most new homes would be gas free. In addition to encouraging electric heat pump technology, the code would establish other electric-ready requirements to facilitate clean electric heating, cooking, and EV charging; it would also expand onsite solar PV and battery storage standards, supporting the state's goals for a 100% clean electricity grid (CEC 2021).

Several other states have also established goals to advance codes toward net zero in the very near future. In early 2021, **Massachusetts** passed one of the most far-reaching climate bills of the year with SB 9. In addition to setting a new state goal to achieve net-zero emissions by 2050, the legislation calls for development of a new, specialized stretch energy code with net-zero performance standards to be made available to jurisdictions for local

adoption in 2022. A draft code will provide a major opportunity for municipalities to further electrify building end uses and terminate reliance on fossil fuels for home heating. A lack of state-level action had prompted a number of municipalities across the state to advance their own local laws incentivizing all-electric new construction; a new statewide stretch code will help provide more uniformity in the market and avoid the creation of a patchwork of diverging local ordinances (Ayyagari and Mushegan 2021).

In September the **Illinois Climate and Equitable Jobs Act** was signed into law. The comprehensive, 1,000-page legislation establishes a state goal to achieve 100% carbon-free electricity along with a broad suite of important energy efficiency provisions. It also issues a call for a state residential and commercial stretch energy code to allow municipalities to go well beyond the energy savings of the state base code. The law includes a code development timeline and "site energy index" performance targets designed to strengthen the code every three years. Recommendations for elements and requirements of the stretch code must be made by July 31, 2023, with final language available for adoption by December 31, 2023 (Lindburg 2021).

Other states moving in a similar direction include **Maine**, whose most recent state climate plan, released in 2020, includes priorities to modernize the state's buildings with a recommendation to reach net-zero carbon emissions for new construction by 2035 (Maine Climate Council 2020). **Oregon's Executive Order 17-20** mandates performance equivalent to that of the DOE Zero Energy Ready Home by October 1, 2023. **Delaware** has a statutory requirement for all new homes to be zero-energy capable by 2025, with a similar 2030 goal for new commercial buildings (16 Del. Code §7602 (c)). In addition, **Washington, D.C.'s Clean Energy DC** plan calls for the District to establish net-zero energy codes by 2026 (District of Columbia DOEE 2021).

However, as seen in Massachusetts (above), local jurisdictions and utilities are not always waiting for states to lead the way. Nadel (2020) highlights a variety of programs currently offered by utilities to incentivize ZEBs and all-electric new construction. For example, in early 2021 National Grid's Path to Zero Net Energy was added to the utility's Residential New Construction (RNC) program within its broader Energy Efficiency program. Through the new initiative, a project that commits to being "zero energy ready" can receive additional technical support as well as extra incentives for meeting the stretch or for being photovoltaic- and EV-ready (National Grid 2021). In Connecticut, the two major utilities (Eversource and United Illuminating) offer a joint residential new-construction program with

several tiers based on Home Energy Rating System scores, with the highest incentives for homes with a score of zero (which essentially means zero net energy).

The New Buildings Institute (NBI) tracks ZEBs and maintains a database of 730 commercial buildings (as of September 2021), including buildings with verified performance data ("verified") and those with modeled performance that is not yet backed by actual data ("emerging") (NBI 2021). Similarly, Team Zero, formerly known as the Net Zero Energy Coalition, tracks and inventories residential zero-energy and zero-ready homes.[33]

STATE BUILDING ENERGY PERFORMANCE STANDARDS

While new building energy codes described above address efficiency in new construction, there are also steadily growing efforts among cities and states to slash emissions from existing buildings through adoption of building energy performance standards (BEPS). These mandatory standards promote energy efficiency retrofits by requiring existing buildings to meet some performance benchmark, with owners having multiple years to bring them into compliance.

Though more common among cities, interest in these standards is also growing among states.[34] In June **Colorado** passed a BEPS bill that makes it the second state (behind Washington State) to adopt such standards. HB 1286 requires annual energy reporting for Colorado's large buildings and development of a performance standard to reduce GHG emissions from these structures 20% by 2030 relative to 2021 levels (CO General Assembly 2021).[35] The state energy office convened a task force in September 2021 to develop

[33] See https://teamzero.org/.

[34] The Institute for Market Transformation (IMT) tracks BPS adoption across the United States and maintains a suite of model documents containing best-practice recommendations. See https://imt.org/public-policy/building-performance-standards/.

[35] Cities that have adopted such requirements include New York City; Washington, D.C.; Boulder, Colorado; and St. Louis. Some jurisdictions are supplementing energy consumption metrics with carbon and GHG emissions metrics. For instance, New York City's Climate Mobilization Act requires buildings of more than 25,000 square feet to cut their carbon emissions by 40% from 2005 levels by 2030 and by more than 80% by 2050. This legislation includes sizable fines for failure to meet the requirements. Boston's Building Energy Reporting and Disclosure Ordinance, enacted in 2013 and amended in 2021, gives the city authority to set carbon limits for large existing buildings. These will decrease over time, with all buildings achieving net-zero emissions by 2050.

recommendations for this standard (Colorado Energy Office 2021). **Washington** filed new rules in October 2020 implementing a clean commercial buildings standard enacted in 2019 (HB 1257). The new standard requires energy intensity improvements for commercial buildings larger than 50,000 square feet, and it goes into effect in 2026; an early adopter incentive program started in 2021 (Washington Department of Commerce 2021). Additionally, in **Washington, D.C**, Mayor Muriel Bowser signed the EV Readiness Amendment Act in early 2021. This legislation will require 20% of parking spaces serving newly constructed or substantially renovated commercial or multiunit buildings to include EV infrastructure (Council of the District of Columbia 2021).

ZERO ENERGY PERFORMANCE INDEX

To offer an objective comparison of state-level building energy codes, the Zero Energy Performance Index (zEPI) Jurisdictional Score, led by NBI with data from the Pacific Northwest National Laboratory, calculates expected energy use intensity in kBtus per square foot by accounting for building type and distribution and regional climate zones for each state.[36] The zEPI scale offers a helpful benchmark to describe the strength of state codes relative to a net-zero standard by setting zEPI's zero value at zero energy consumption, with a baseline roughly equivalent to the average building in the year 2000.

Some home-rule states that have no mandatory state code and adopt building energy codes at the local level lack sufficient data to allow calculation of a zEPI value.[37] Ten states lack mandatory statewide energy codes for new residential and/or commercial construction (Alaska, Arizona, Colorado, Kansas, Mississippi, Missouri, Nevada, North Dakota, South Dakota, and Wyoming). Nonetheless, some of these home-rule states are showing high rates of adoption at the jurisdictional level. In Arizona, for example, the two most populous cities,

[36] PNNL conducts state-level technical analysis based on a methodology established by DOE. PNNL reviews state energy codes based on the IECC and ASHRAE Standard 90.1, including any significant amendments. This helps states understand how their codes compare with the national model codes and provides a portrait of national code adoption. A quantitative analysis is performed to assess the energy savings impacts within a given state. The calculated energy use intensity of buildings constructed to a particular state code is compared with the energy use of the model energy code. This comparison allows a categorization of each state, with categories based on recent editions of the model codes.

[37] Home-rule decentralizes power, allowing localities to exercise certain prerogatives of governance within their own administrative area. See database.aceee.org for more information on building codes in home-rule states.

Phoenix and Tucson, have both adopted the 2018 IECC. For detailed information on building code stringency in each state, visit ACEEE's State and Local Policy Database (ACEEE 2021c).

Table 7 shows state-by-state scores for this category. We should note that some states have adopted more-efficient codes in recent months, too late to have new zEPI scores calculated in time for *Scorecard* publication. We note these states with an asterisk.[38]

[38] Earlier *State Scorecards* included zEPI scores that awarded minor point adjustments for stretch code adoption in local jurisdictions, which had the effect of improving the overall performance level of mandatory energy code adoptions within a state base. This year's report removes this zEPI adjustment in anticipation of a new *Scorecard* metric for 2022 that will award separate points for states that have adopted a statewide stretch code. Therefore, the zEPI scores in table 7 are solely a reflection of the state's baseline building energy code.

Table 7. State zEPI scores for code stringency

State	zEPI score	Residential code
CA*	Custom	*2019 Building Energy Efficiency Standards*
OR		*2021 OR Residential Specialty Code (2018 IEEC)*
NV*		*IECC_2021*
VA*		*IECC_2018 with amendments*
HI*	~~Home Rule~~	*IECC_2018 with amendments*
TN	~~Home Rule~~	*IECC_2018*
ME*		*IECC_2015*
VT	43.2	IECC_2018 with amendments
WA	45.0	2018 WA State Energy Code (exceeds 2018 IECC)*
MA	49.0	IECC_2018 with amendments
DE	52.0	IECC_2018
MN	52.2	IECC_2012 with amendments
NE	53.2	IECC_2018
MD	54.3	IECC_2018 with amendments
NY	54.4	IECC_2018
MI	55.0	IECC_2015 with amendments
IA	56.0	IECC_2012 with amendments
MT	56.2	IECC_2018 with amendments
CT	56.5	IECC_2015 with amendments
IL	56.8	IECC_2018 with amendments
OH	57.3	IECC_2018 with amendments
NM	58.1	IECC_2018 with amendments
PA	58.3	IECC_2015 with amendments
DC	59.1	IECC_2015 with amendments
AL	59.4	IECC_2015 with amendments
IN	59.5	IECC_2018 with amendments
GA	59.7	IECC_2015 with amendments
TX	59.9	IECC_2015
NC	60.4	IECC_2015 with amendments
VA	60.8	IECC_2015 with amendments
NJ	62.4	IECC_2018 with amendments
ID	63.0	IECC_2018 with amendments
NH	63.3	IECC_2015 with amendments
FL	64.6	IECC_2018 with amendments
UT	65.1	IECC_2015 with amendments
RI	66.1	IECC_2015 with amendments
WI	66.8	IECC_2009 with amendments
OK	67.9	IECC_2009 with amendments
KY	69.2	IECC_2009
WV	69.4	IECC_2009
SC	69.6	IECC_2009
LA	69.7	IECC_2009
AR	72.5	IECC_2009 with amendments
AK		Most new construction follows 2012 IECC
AZ	~~Home Rule~~	Significant local adoption of 2018 IECC
CO	~~Home Rule~~	Significant adoption of 2015/2018 IECC
KS	~~Home Rule~~	Significant adoption of 2009/2012 IECC
MS	~~Home Rule~~	None statewide
MO	~~Home Rule~~	Significant adoption of 2009/2012 IECC
ND	~~Home Rule~~	Significant local adoption of 2015 IECC
SD	~~Home Rule~~	Significant local adoption of 2015 IECC
WY	~~Home Rule~~	No mandatory code

State	zEPI score	Commercial code
CA*	Custom	*2019 Building Energy Efficiency Standards*
OR		*2021 OR EE Specialty Code (90.1-2019)*
VA*		*IECC_2018*
HI*	~~Home Rule~~	*IECC_2018 with amendments*
ME*		*IECC_2015*
MA	46.5	2018 IECC and 90.1-2016^
VT	46.5	2018 IECC and 90.1-2016^
NJ	48.0	90.1-2016
DE	49.5	2018 IECC and 90.1-2016
IL	49.5	2018 IECC and 90.1-2016
MI	49.5	2015 IECC and 90.1.2013^
CT	50.3	2015 IECC and 90.1-2013
DC	50.3	90.1-2013^
MD	50.3	2018 IECC and 90.1-2016
NE	50.3	2018 IECC and 90.1-2016
PA	50.3	2015 IECC and 90.1-2013
MT	51.0	2018 IECC and 90.1-2016
NH	51.0	2015 IECC and 90.1-2013
NY	51.0	2018 IECC and 90.1-2016^
AL	51.8	90.1-2013
GA	51.8	2015 IECC and 90.1-2013^
ID	51.8	2018 IECC and 90.1-2016
TX	51.8	2015 IECC and 90.1-2013
UT	51.8	2018 IECC and 90.1-2016
FL	52.5	2018 IECC and 90.1-2016^
MN	52.5	2018 IECC and 90.1-2016^
NM	52.5	2018 IECC and 90.1-2016^
RI	52.5	2015 IECC^
VA	52.5	2015 IECC and 90.1-2013
WA	52.5	2018 WA State Energy Code (ASHRAE 90.1-2016)
WI	52.5	2015 IECC and 90.1-2013^
NV	53.3	2018 IECC and 90.1-2016
NC	54.8	2015 IECC and 90.1-2013^
WV	54.8	90.1-2010
KY	60.8	2012 IECC and 90.1-2010
IA	61.5	2012 IECC and 90.1-2010
OH	63.0	2012 IECC and 90.1-2010
TN	63.0	2012 IECC and 90.1-2010
IN	69.0	90.1-2007
AR	69.8	2009 IECC and 90.1-2007
LA	69.8	90.1-2007
SC	69.8	2009 IECC and 90.1-2007
OK	79.5	2006 IECC and 90.1-2004
AK		*None statewide*
AZ	~~Home Rule~~	Significant local adoption of 2018 IECC
CO	~~Home Rule~~	Significant adoption of 2015/2018 IECC
KS	~~Home Rule~~	Significant adoption of 2009/2012 IECC
MS	~~Home Rule~~	None statewide
MO	~~Home Rule~~	Significant adoption of 2009/2012 IECC
ND	~~Home Rule~~	Significant local adoption of 2015 IECC
SD	~~Home Rule~~	Significant local adoption of 2015 IECC
WY	~~Home Rule~~	Significant adoption of IECC 2006 or equivalent

*** These states adopted a new iteration of codes effective by October 1, 2021, but updated zEPI calculations had not yet been made available when this Scorecard was being prepared. ^ When an amendment's impact on energy efficiency could be quantified using DOE Prototype Building Models, this was captured in the analysis.**

5. Appliance and Equipment Efficiency Standards

The past year was one of the most active for state appliance standards in recent history. Since December 2020, five states—Maine, Massachusetts, Nevada, Oregon, and Rhode Island—plus the District of Columbia have adopted energy- and water-saving appliance standards, a rapid series of victories for consumers, businesses, and the climate.[39] The new state laws will require minimum energy and water use efficiency levels for more than 15 types of products including air purifiers, computers, and restaurant equipment. The standards will reduce utility bills and carbon dioxide emissions, bringing each state closer to meeting its climate goals.

The year's momentum builds on other recent victories, with 12 jurisdictions in total—those above plus California, Colorado, Hawaii, New York, Vermont, and Washington—adopting standards since 2018. Despite this progress, more states need to cut their own emissions and pave the way for new national standards that deliver even larger reductions in climate-warming emissions.

STATE AND FEDERAL STANDARDS WORK IN CONCERT

States have historically led the way in establishing standards for appliances and other equipment. In 1976 California became the first state to introduce appliance standards. Many others, including New York and Massachusetts, soon followed. Congress established the first national standards—based on those previously adopted by California and several other states—in 1987 when it passed the National Appliance Energy Conservation Act. Congress enacted additional national standards in 1988, 1992, 2005, and 2007, generally basing them on existing state standards. More than 60 products are now subject to national efficiency standards.

Existing national standards saved the average U.S. household about $500 a year on utility bills in 2015, or about 16% of average annual utility bill spending (deLaski and Mauer 2017). Newer research, from 2020, shows that setting or strengthening standards for 47 products could save the average American household an additional $230 annually on utility bills by 2035. These updates could cut carbon emissions over the next three decades by an amount

[39] Shortly before this report's publication, in late January 2022 the governor of New Jersey also signed legislation setting energy efficiency standards for 17 appliances.

equivalent to eliminating at least 13 coal-fired power plants; they could also cut peak electricity demand by almost 90 gigawatts by 2050, which is equivalent to about 13% of current peak demand (Mauer and deLaski 2020).

While the U.S. DOE works to catch up on a backlog of reviews of existing federal standards inherited from the prior administration, many states have maintained momentum by pursuing standards based on recommendations from the Appliance Standards Awareness Project (ASAP) and ACEEE report *States Go First* (Mauer, deLaski, and DiMascio 2017).[40] States are free to set standards for any products that are not subject to national standards. Efficiency levels for products in the state legislation are based on California standards, industry standards, and ENERGY STAR® and WaterSense specifications. Some states added legislative provisions to protect against the rollback of federal light bulb standards.

MORE-EFFICIENT EQUIPMENT IN HOMES AND BUSINESSES

There were several firsts in 2021. Massachusetts adopted the first standards for electric vehicle chargers, a critical step as vehicle charging is expected to grow rapidly in the coming years. Nevada was the first state to adopt standards for gas fireplaces. The District of Columbia adopted air purifier standards in December 2020. As the air purifier market grows quickly in response to wildfires and the pandemic, it is important that consumers have access to efficient products.

Oregon became the second state, after Washington, to adopt a standard for grid-enabled water heaters. The standard requires electric water heaters to be able to automatically adjust their power usage in response to changes in electricity prices or the needs of the power grid. This feature will allow utilities to offer valuable demand response programs, which can save consumers money, reduce the need to operate polluting peaker power plants, and potentially prevent dangerous blackouts. Nevada legislators authorized their state energy office to adopt similar grid-enabled standards for energy-intensive appliances like air conditioners and water heaters.

Combined, ASAP estimates standards adopted this past year will save residents of the four states—Massachusetts, Nevada, Oregon, and Rhode Island—plus D.C. $485 million on their

[40] The report, which was updated in 2021, recommends a package of standards that states can adopt and analyzes potential energy, water, and utility bill savings and emissions reductions.

utility bills annually by 2035 and cut cumulative greenhouse gas emissions through 2035 by 4.4 million metric tons, an amount equivalent to removing 957,000 cars from the road for a year. The standards will also save 17 billion gallons of water annually by 2035 (ASAP 2021).[41]

Standards for products such as faucets or showerheads are especially important for drought-prone states, particularly in the West. California, Colorado, Nevada, Oregon, and Washington have already adopted standards for a handful of water-using products. Other western states that face similar challenges, such as Utah and Arizona, have not yet set such standards.

State legislatures looking for new ways to combat water shortages, reduce greenhouse gas emissions, and save residents money can do so with efficiency standards. When numerous states make progress, it creates momentum for federal standards. Carbon emissions will continue to decrease faster as states and DOE continue to work on parallel tracks to adopt efficiency standards for new and existing products.

Table 8 shows project savings through 2035 from recent appliance standard adoptions based on ASAP analysis.

Table 8. Project savings from appliance efficiency standards

State	Energy savings from state standards through 2035 (MMBtus/capita)	Year most recent state standards were adopted
California	38.1	2020
Washington	18.9	2019
Colorado	18.7	2019
Vermont	17.1	2019
Nevada	15.7	2021
District of Columbia	15.1	2020
Oregon	15.0	2021

[41] The Maine law (An Act to Establish Energy and Water Standards) identifies 10 products and authorizes the Department of Environmental Protection to set rules regarding their sale in the state. Because standard levels have not yet been determined, savings for Maine have not been calculated.

State	Energy savings from state standards through 2035 (MMBtus/capita)	Year most recent state standards were adopted
Hawaii	14.0	2019
Massachusetts	13.9	2021
Rhode Island	8.6	2021
New York	4.4	2019

6. Room for Improvement: Key Strategies for Improving Energy Efficiency

The year 2021 revealed a variety of practical policy tools and program designs that are available to state officials to scale up energy savings across multiple use sectors, thus delivering immense carbon savings to help meet U.S. climate goals. These programs also provide an important opportunity to support economic recovery from COVID-19 by helping to reduce home and business energy bills, generate employment, and lessen the need for imported fuels. The following list highlights examples of best practices by state policymakers seeking to improve energy efficiency performance by energy utilities, in the buildings and transportation sectors, and through appliance standards. We also highlight best practices that reduce legal and market barriers to investing in energy efficiency and expand participation in programs that achieve savings.

Establish and adequately fund an energy efficiency resource standard or similar energy savings target. EERS policies set specific energy savings targets that utilities or independent statewide program administrators must meet through customer energy efficiency programs. They serve as an enabling framework for cost-effective investment and program activity. As states address evolving priorities such as decarbonization, cost, equity, and grid value, regulators in places like Massachusetts and New York are adjusting targets to incorporate multiple goals (e.g., fuel-neutral savings) that better align efficiency programs with electrification and GHG reduction objectives. Additional states like Colorado, Illinois, and Minnesota have passed legislation enabling incorporation of savings from GHG-reducing electrification into efficiency portfolios.

Examples: Arkansas, Colorado, Massachusetts, Michigan, Minnesota, New Jersey, New York, Virginia

Adopt California tailpipe emissions standards and set quantitative targets for reducing vehicle miles traveled (VMT). Transportation consumes almost 30% of the total energy used in the United States and therefore offers an important opportunity to reduce carbon emissions (EPA 2021a). At the state level, a comprehensive approach to transportation energy efficiency must address both individual vehicles and the entire transportation system. A variety of state-level policy options are available to improve transportation system efficiency. These include codifying targets for reducing VMT and integrating land use and transportation planning to create communities where people have access to multiple modes of travel and need not rely on owning personal vehicles. While federal fuel economy

standards are expected to go a long way toward reducing fuel consumption, these efforts were significantly slowed by rollback efforts of the prior administration, and current standards proposed by the EPA would at best recapture 67% of the emissions cuts that would have occurred under prior, Obama-era rules. States that adopt California's tailpipe emissions standards will lead the way by pushing manufacturers to offer a greater variety of low- and zero-emission vehicles and accelerate the transition to EVs.

Examples: California, Colorado, Massachusetts, New York, Oregon

Ensure that energy efficiency and clean energy investments and opportunities are inclusive and that benefits accrue to all customers, especially households overburdened by energy costs. Historically marginalized groups have been underserved and underrepresented in clean energy planning and policymaking and face high household energy burdens. States can foster equity in key decision-making processes by taking steps to ensure that their efforts are inclusive and designed with all communities in mind. Such steps can include establishing internal metrics and frameworks that evaluate the degree to which policy and program outcomes are equitable, developing stakeholder processes that compensate eligible organizations representing marginalized groups for their participation, and adopting inclusive workforce development practices to offer new economic and educational opportunities to groups often underrepresented in the energy efficiency workforce. States can also strengthen incentives and programs for income-qualified customers and can work with utilities and regulators to recognize and value program nonenergy benefits, such as health and economic improvements, as a means of expanding these investments. States and PUCs can also include goals specific to the low-income sector, either within an EERS or as a stand-alone minimum acceptable threshold, to ensure that investments are directed toward these customers.

Examples: California, New Jersey, Oregon, Pennsylvania, Tennessee, Washington

Adopt updated, energy-efficient building energy codes, improve code compliance, and involve efficiency program administrators in code support. Buildings use more than 40% of the total energy consumed in the United States, making them an essential target for cutting energy waste and emissions (EIA 2020a). Routinely updating and strengthening building energy codes for new construction is one way to ensure a minimum level of energy efficiency for new residential and commercial buildings. Additional strategies such as energy performance standards for existing buildings, benchmarking and transparency policies, and financing tools to encourage deep retrofits are also critical for improving efficiency in the existing building stock and reducing building carbon emissions.

Examples: California, Illinois, Maryland, Nebraska, New Mexico, District of Columbia, Oregon, Washington

Expand state government–led initiatives and make them visible. States can establish sustainable funding sources for energy efficiency incentive programs, invest in energy efficiency–related R&D and demonstration centers, and lead by example by incorporating energy efficiency into government operations. Integrating efficiency into their own operations empowers governments to reduce energy use in public buildings and fleets and to use energy savings performance contracts to finance energy-saving projects. States can also work with utilities and community-based organizations to promote and coordinate stretch code adoption, energy code compliance training, and workforce development programs.

Examples: Alaska, Connecticut, New York

Explore and promote innovative financing mechanisms to leverage private capital and lower the upfront costs of energy efficiency measures. Although utilities in many states offer some form of on-bill financing to promote energy efficiency in homes and buildings, expanding lender and customer participation has been an ongoing challenge. States can pass legislation to increase stakeholder awareness and address legal barriers to the implementation of financing programs. A growing number of states are seeking new ways to maximize the impact of public funds and invigorate energy efficiency by attracting private capital through emerging financing models such as Property Assessed Clean Energy programs and green banks.

Examples: Colorado, Connecticut, Minnesota, Missouri, New York, Rhode Island, Virginia

Adopt cost-effective efficiency standards for appliances, equipment, lighting, and plumbing products. State appliance standards are a proven policy that lowers utility bills for customers and businesses, reduces pollution, and helps spur national standards. Even when standards are not adopted at the federal level, adoption by just a few states can be enough to impact national markets. In 2020 ASAP outlined a menu of new or strengthened standards for 47 products that, if adopted federally, would reduce annual average household utility bills by more than $100 in 2030 and deliver cumulative utility bill savings of $1.1 trillion through 2050 for consumers and businesses. By 2050 peak electricity demand would be reduced by almost 90 gigawatts (GW), which is equivalent to about 13% of current total peak demand, allowing faster decarbonization of the electric grid at a lower cost (Mauer and deLaski 2020).

Examples: California, Colorado, Washington, Hawaii, Nevada, New York, Vermont

References

ACEEE. 2019. State Energy Efficiency Resource Standard (EERS) Activity. Washington, DC: ACEEE. aceee.org/content/state-energy-efficiency-resource-standard-eers-activity.

———. 2021a. "Biden's Proposed Car Standards Come Far Short of Undoing Damage of Trump Rollback," August 5, 2021. aceee.org/blog-post/2021/08/bidens-proposed-car-standards-come-far-short-undoing-damage-trump-rollback.

———. 2021b. "Leading with Equity: Centering Equity across ACEEE's Scorecards." aceee.org/energy-equity-initiative.

———. 2021c. "State and Local Policy Database." Accessed July. database.aceee.org/.

ASAP (Appliance Standards Awareness Project). 2021. "Report Overview and Updates: States Go First." appliance-standards.org/document/report-overview-states-go-first.

Ayyagari, S., and S. Mushegan. "New Climate Law Stretches Massachusetts Building Codes to the Next Level." *RMI Blog*, March 29. rmi.org/new-climate-law-stretches-massachusetts-building-codes-to-the-next-level.

Berg, W., S. Nowak, M. Kelly, S. Vaidyanathan, M. Shoemaker, A. Chittum, M. DiMascio, and C. Kallakuri. 2016. *The 2016 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u1606.

Berg, W., S. Nowak, M. Kelly, S. Vaidyanathan, M. Shoemaker, A. Chittum, M. DiMascio, and H. DeLucia. 2017. *The 2017 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u1710.

Berg, W., S. Nowak, G. Relf, S. Vaidyanathan, E. Junga, M. DiMascio, and E. Cooper. 2018. *The 2018 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u1808.

Berg, W., S. Vaidyanathan, E. Junga, E. Cooper, G. Relf, A. Whitlock, M. DiMascio, C. Waters, and N. Cortez. 2019. *The 2019 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u1908.

Berg, W., S. Vaidyanathan, B. Jennings, E. Cooper, C. Perry, M. DiMascio, and J. Singletary. 2020. *The 2020 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u2011.

Brooks, J., D. Cross-Call, H. House, and J. Shipley. 2020. *North Carolina Energy Regulatory Process: In Fulfillment of the North Carolina Clean Energy Plan B-1 Recommendation*. Boulder, CO: RMI (Rocky Mountain Institute). Montpelier, VT: RAP (Regulatory Assistance Project). files.nc.gov/ncdeq/NERP%202020_Final%20Report%20and%20Products%20%281%29_0.pdf.

BTS (Bureau of Transportation Statistics). 2019. "Freight Transportation Energy Use & Environmental Impacts." data.bts.gov/stories/s/Freight-Transportation-Energy-Use-Environmental-Im/f7sr-d4s8.

Buylova, A. 2021. "Spatial Distribution of Energy Use Intensity in Residential Housing in Oregon." Accessed August. osugisci.maps.arcgis.com/apps/webappviewer/index.html?id=189e21ea4f694168ad519a18ef99ef60.

California Energy Commission. 2021. "Energy Commission Adopts Updated Building Standards to Improve Efficiency, Reduce Emissions from Homes and Businesses." www.energy.ca.gov/news/2021-08/energy-commission-adopts-updated-building-standards-improve-efficiency-reduce-0.

CEE (Consortium for Energy Efficiency). 2012. "Efficiency Program Industry by State and Region Appendices." *2011 State of the Efficiency Program Industry Report*. Boston: CEE. library.cee1.org/content/efficiency-program-industry-state-and-region-appendices-2011.

———. 2013. "Efficiency Program Industry by State and Region Appendices." *2012 State of the Efficiency Program Industry Report*. Boston: CEE. library.cee1.org/content/efficiency-program-industry-state-and-region-appendices-2012.

———. 2014. "Efficiency Program Industry by State and Region Appendices." *2013 State of the Efficiency Program Industry Report*. Boston: CEE. library.cee1.org/content/efficiency-program-industry-state-and-region-appendices-2013.

———. 2015. "Efficiency Program Industry by State and Region Appendices." *2014 State of the Efficiency Program Industry Report.* Boston: CEE. library.cee1.org/content/efficiency-program-industry-state-and-region-appendices-2014.

———. 2016. "Efficiency Program Industry by State and Region Appendices." *2015 State of the Efficiency Program Industry Report.* Boston: CEE. library.cee1.org/content/efficiency-program-industry-state-and-region-appendices-2015.

———. 2017. "Efficiency Program Industry by State and Region Appendices." *2016 State of the Efficiency Program Industry Report.* Boston: CEE. library.cee1.org/content/efficiency-program-industry-state-and-region-appendices-2016.

———. 2018. "Efficiency Program Industry by State and Region Appendices." *2017 State of the Efficiency Program Industry.* Boston: CEE. library.cee1.org/content/efficiency-program-industry-state-and-region-appendices-2017.

Colorado Energy Office. 2021. "Building Benchmarking." Accessed October. energyoffice.colorado.gov/climate-energy/energy-policy/building-benchmarking.

Colorado General Assembly. 2021. *HB21-1286: Energy Performance for Buildings*. Denver: Colorado General Assembly. leg.colorado.gov/bills/hb21-1286.

Connecticut DEEP (Department of Energy and Environmental Protection). 2021. *Equitable Energy Efficiency (E3) Proposed Phase 1 Actions and Recommendations.* portal.ct.gov/-/media/DEEP/energy/ConserLoadMgmt/E3-Proposed-Phase-I-Actions-and-Recommendations.pdf.

Council of the District of Columbia. 2021. *B23-0193—Electric Vehicle Readiness Amendment Act of 2019*. Washington, DC: Council of the District of Columbia. lims.dccouncil.us/Legislation/B23-0193.

deLaski, A., and J. Mauer. 2017. *Energy-Saving States of America: How Every State Benefits from National Appliance Standards*. Washington, DC: ACEEE. aceee.org/white-paper/energy-saving-states-america.

Dewey, A., J. Mah, and B. Howard. 2021. *Ready to Go: State and Local Efforts Advancing Energy Efficiency*. Washington, DC: ACEEE. www.aceee.org/toolkit/2021/11/ready-go-state-and-local-efforts-advancing-energy-efficiency.

District of Columbia DOEE (Department of Energy & Environment). 2021. "Carbon Free DC." Accessed September. storymaps.arcgis.com/stories/034104405ef9462f8e02a49f2bd84fd9.

DOE (Department of Energy). 2021. "Determinations." Accessed September. energycodes.gov/determinations.

Drehobl, A. 2021. *ACEEE's Leading with Equity Initiative: Key Findings and Next Steps*. Washington, DC: ACEEE. aceee.org/white-paper/2021/12/aceees-leading-equity-initiative.

Drehobl, A., L. Ross, and R. Ayala. 2020. *How High Are Household Energy Burdens? An Assessment of National and Metropolitan Energy Burden across the U.S.* Washington, DC: ACEEE. www.aceee.org/research-report/u2006.

EIA (Energy Information Administration). 2020b. "Natural Gas: Number of Natural Gas Customers." www.eia.gov/dnav/ng/ng_cons_num_dcu_nus_a.htm.

———. 2021a. "Electricity: Annual Electric Power Industry Report, Form EIA-861 Detailed Data Files." www.eia.gov/electricity/data/eia861/.

———. 2021b. "Frequently Asked Questions: How Much Energy Is Consumed in U.S. Buildings?" eia.gov/tools/faqs/faq.php?id=86&t=1.

———. 2021c. "Frequently Asked Questions: What Are U.S. Energy-Related Carbon Dioxide Emissions by Source and Sector?" www.eia.gov/tools/faqs/faq.php?id=75&t=11.

———. 2021d. "Natural Gas: Natural Gas Consumption by End Use." www.eia.gov/dnav/ng/ng_cons_sum_a_EPG0_vrs_mmcf_a.htm.

———. 2021e. "Natural Gas: Number of Natural Gas Customers." www.eia.gov/dnav/ng/ng_cons_num_a_EPG0_VN3_Count_a.htm.

———. 2021f. "State Energy Data System (SEDS): 2020 (Updates by Energy Source)." eia.gov/state/seds/seds-data-fuel.php?sid=US#WoodandBiomassWaste.

Eldridge, M., M. Neubauer, D. York, S. Vaidyanathan, A. Chittum, and S. Nadel. 2008. *The 2008 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. www.aceee.org/research-report/e086.

Eldridge, M., W. Prindle, D. York, and S. Nadel. 2007. *The State Energy Efficiency Scorecard for 2006*. Washington, DC: ACEEE. aceee.org/research-report/e075.

Eldridge, M., M. Sciortino, L. Furrey, S. Nowak, S. Vaidyanathan, M. Neubauer, N. Kaufman, A. Chittum, S. Black, C. Sheppard, C. Chamberlin, A. Jacobson, Y. Mugica, and D. Bryk. 2009. *The 2009 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/e097.

EPA (Environmental Protection Agency). 2021a. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2019*. Washington, DC: EPA. www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019.

———. 2021b. "Proposed Rule to Revise Existing National GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026." epa.gov/regulations-emissions-vehicles-and-engines/proposed-rule-revise-existing-national-ghg-emissions.

———. 2021c. "Sources of Greenhouse Gas Emissions." epa.gov/ghgemissions/sources-greenhouse-gas-emissions.

Gilleo, A., S. Nowak, M. Kelly, S. Vaidyanathan, M. Shoemaker, A. Chittum, and T. Bailey. 2015. *The 2015 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u1509.

Gold, R., A. Gilleo, and W. Berg. 2019. *Next-Generation Energy Efficiency Resource Standards*. Washington, DC: ACEEE. aceee.org/research-report/u1905.

Gold, R., L. Ungar, and W. Berg. 2021. *An Energy Efficiency and Clean Electricity Standard: Managing Demand Is Key to a Cheaper and More Equitable Carbon-Free Electric Grid*. Washington, DC: ACEEE. www.aceee.org/policy-brief/2021/07/energy-efficiency-clean-electricity-standard-managing-demand-key-cheaper-and.

Hawaii PUC (Public Utilities Commission). 2021. "Performance Based Regulation (PBR)." puc.hawaii.gov/energy/pbr.

House Committee on Energy and Commerce. 2021. Fact Sheet on Key Provisions in the Committee Prints of the Build Back Better Act. Washington, DC: U.S. Congress. energycommerce.house.gov/sites/democrats.energycommerce.house.gov/files/documents/Updated%20Fact%20Sheet%20on%20E%26C%20Build%20Back%20Better%20Key%20Provisions.pdf.

Howland, E. "North Carolina passes bill expected to give Duke timely cost recovery, implement clean energy plan." 5 October 2021. www.utilitydive.com/news/duke-energy-cost-recovery-north-carolina-bill-climate/607671/.

Jones, E. 2021. "Energy Efficiency Progress in 2021 Southwest Legislative Sessions." *SWEEP Blog*, August 13. swenergy.org/2021-southwest-legislative-sessions.

Jordan, P. 2020. *Memorandum: Clean Energy Employment Initial Impacts from the COVID-19 Economic Crisis, April 2020*. Wrentham, MA: BW Research Partnership. e2.org/wp-content/uploads/2020/05/Clean-Energy-Jobs-April-COVID-19-Memo-FINAL.pdf.

Langer, T., and S. Vaidyanathan. 2020. *Energy Efficiency and Greenhouse Gas Emissions Reductions through State Freight Planning*. Washington, DC: ACEEE. aceee.org/white-paper/2020/07/energy-efficiency-and-greenhouse-gas-emissions-reductions-through-state-freight.

Laska, A. 2021. "Freight Rail's Role in a Net-Zero Economy" *Third Way*, June 7. www.thirdway.org/memo/freight-rails-role-in-a-net-zero-economy.

Leard, B., and V. McConnell. 2020. *Progress and Potential for Electric Vehicles to Reduce Carbon Emissions*. Washington, DC: Resources for the Future. media.rff.org/documents/EV_Report_CKk1rbq.pdf.

Lindburg, A. 2021. "Creation of Stretch Code Becomes Law in Illinois." *MEEA Blog*, September 24. mwalliance.org/blog/creation-stretch-code-becomes-law-illinois.

Maine Climate Council. 2020. *Maine Won't Wait: A Four-Year Plan for Climate Action*. Bangor: Maine Climate Council. maine.gov/future/sites/maine.gov.future/files/inline-files/MaineWontWait_December2020.pdf.

Maine Legislature. 2019. An Act to Transform Maine's Heat Pump Market to Advance Economic Security and Climate Objectives—S.P. 597, Sec. 1. 10 MRSA §1415-G, sub-§1. Augusta: Maine Legislature. www.mainelegislature.org/legis/bills/bills_129th/billtexts/SP059701.asp.

MAP-21 (Moving Ahead for Progress in the 21st Century Act). 2012. Pub. L. No. 112–141, 126 Stat. 405.

Massachusetts DOER (Department of Energy Resources). 2021a. "Baker-Polito Administration Sets Ambitious Emissions Reduction Goal for Energy Efficiency Plan." www.mass.gov/news/baker-polito-administration-sets-ambitious-emissions-reduction-goal-for-energy-efficiency-plan in addition to Mass Save 2021.

———. 2021b. *Greenhouse Gas Emissions Reduction Goal for Mass Save*. Boston: Massachusetts DOER. mass.gov/doc/greenhouse-gas-emissions-reduction-goal-for-mass-save/download.

———. 2021c. *Re: Greenhouse Gas Emissions Reduction Goal for Mass Save*. 15 July 2021. mass.gov/doc/greenhouse-gas-emissions-reduction-goal-for-mass-save/download.

Massachusetts EEAC (Energy Efficiency Advisory Council). 2021. *Updated EWG Recommendations 2/19/2021*. Boston: Massachusetts DOER (Department of Energy Resources). ma-eeac.org/wp-content/uploads/EWG-Recommendations-2.19.21.pdf.

Mass Save. 2021a. *Massachusetts Joint State Wide Electric and Gas Three-Year Energy Efficiency Plan 2022–2024*. Boston: Massachusetts DPU (Department of Public Utilities). ma-eeac.org/wp-content/uploads/Mass.-Statewide-Energy-Efficiency-Plan-Submitted-April-30-2021.pdf.

———. 2021b. *Term Sheet: Massachusetts Joint Statewide Electric and Gas Three-Year Energy Efficiency Plan for 2022–2024—Delivering Savings and Transition Toward Climate and Equity Imperatives*. Boston: Massachusetts DPU (Department of Public Utilities). ma-eeac.org/wp-content/uploads/2022-2024-Term-Sheet-10.26.21-Final-with-Exhibits.pdf

Mauer, J., A. deLaski, and M. DiMascio. 2017. States Go First: How States Can Save Consumers Money, Reduce Energy and Water Waste, and Protect the Environment with New Appliance Standards. Washington, DC: ACEEE. aceee.org/research-report/a1702.

Mauer, J., and A. deLaski. 2020. *A Powerful Priority: How Appliance Standards Can Help Meet U.S. Climate Goals and Save Consumers Money*. Washington, DC: ACEEE. www.aceee.org/powerful-priority.

McGowan, E. 2021. "Greenhouse Gas Pact Will Open Door to Weatherization for Virginia Households." *Energy News Network*, August 4. energynews.us/2021/08/04/greenhouse-gas-pact-will-open-door-to-weatherization-for-virginia-households.

MEEA (Midwest Energy Efficiency Alliance). 2021. "MEEA Policy Insider—August 2021." www.mwalliance.org/meea-policy-insider-august-2021.

Michigan Office of the Governor. 2020a. *Executive Directive 2020-10: Building a Carbon-Neutral Michigan*. Lansing: Michigan Office of the Governor. michigan.gov/whitmer/0,9309,7-387-90499_90704-540278--,00.html.

———. 2020b. *Executive Order 2020-182: Council on Climate Solutions*. Lansing: Michigan Office of the Governor. michigan.gov/whitmer/0,9309,7-387-90499_90705-540277--,00.html.

Michigan PSC (Public Service Commission). 2020. *Order: In the Matter, on the Commission's Own Motion, to Open a Docket for Certain Regulated Electric Utilities to File Their Distribution Investment and Maintenance Plans and for Other Related, Uncontested Matters.* Case No. U-20147, August 20. Lansing: Michigan PSC. mi-psc.force.com/sfc/servlet.shepherd/version/download/068t000000DcfWRAAZ.

———. 2021. "Energy Affordability and Accessibility Collaborative." michigan.gov/mpsc/0,9535,7-395-93307_93312_93320_94834-558075--,00.html.

Nadel, S. 2020. *Programs to Promote Zero-Energy New Homes and Buildings*. Washington, DC: ACEEE. www.aceee.org/sites/default/files/pdfs/zeb_topic_brief_final_9-29-20.pdf.

Nadel, S., and L. Ungar. 2019. *Halfway There: Energy Efficiency Can Cut Energy Use and Greenhouse Gas Emissions in Half by 2050*. Washington, DC: ACEEE. aceee.org/research-report/u1907.

Nadel, S., T. Kubo, and H. Geller. 2000. *State Scorecard on Utility Energy Efficiency Programs*. Washington, DC: ACEEE. aceee.org/research-report/u004.

NASEO (National Association of State Energy Officials). 2022. "REV West." naseo.org/issues/transportation/rev-west.

National Grid. 2021. *Rhode Island Residential New Construction (RNC) Program & Zero Energy Homes*. Providence: National Grid. nationalgridus.com/media/pdfs/resi-ways-to-save/ee6174_ri_newconsprogram.pdf.

NBI (New Buildings Institute). 2021. "Getting to Zero Buildings Database." www.newbuildings.org/resource/getting-to-zero-database/.

Nevada Clean Cars. 2021. "Clean Cars Nevada Races Toward Finish Line With Unanimous Support from State Environmental Commission." nevadacleancars.org/clean-cars-nevada-races-toward-finish-line-with-support/.

Nevada Legislature. 2019. *SB 358, An Act Relating to Renewable Energy*. Carson City: Nevada Legislature. leg.state.nv.us/App/NELIS/REL/80th2019/Bill/6651/Text.

———. 2021a. *SB 430, An Act Relating to Infrastructure*. Carson City: Nevada Legislature.leg.state.nv.us/App/NELIS/REL/81st2021/Bill/8161/Text.

———. 2021b. *SB 448, An Act Relating to Utilities*. Carson City: Nevada Legislature. leg.state.nv.us/App/NELIS/REL/81st2021/Bill/8201/Text.

Nevada PUC (Public Utilities Commission). 2021. *Investigation Regarding Long-Term Planning for Natural Gas Utility Service in Nevada*. Docket 21-05002, September 24. Carson City: Nevada PUC. pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2020_THRU_PRESENT/2021-5/12764.pdf.

NYSDEC (New York State Department of Environmental Conservation). 2021. "Climate Action Council Marks Critical Milestone to Advance New York's Nation-Leading Climate Law." www.dec.ny.gov/press/122962.html.

Oregon Legislature. 2021a. *House Bill 2021, An Act Relating to Clean Energy*. Salem: Oregon Legislative Assembly. olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2021/Enrolled.

———. 2021b. *House Bill 2475, An Act Relating to Public Utilities*. Salem: Oregon Legislative Assembly. olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2475/Enrolled.

———. 2021c. *House Bill 2739, An Act Relating to Utility Ratepayer Assistance*. Salem: Oregon Legislative Assembly. olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2739/Enrolled.

———. 2021d. *House Bill 3141, An Act Relating to Energy*. Salem: Oregon Legislative Assembly. olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB3141/Enrolled.

PPL (PPL Corporation). 2021. "PPL Corporation Companies Join Electric Highway Coalition to Support EV Adoption." pplweb.mediaroom.com/2021-09-27-PPL-Corporation-companies-join-Electric-Highway-Coalition-to-support-EV-adoption.

Regional Electric Vehicle Midwest Coalition. 2021. "Memorandum of Understanding Between Illinois, Indiana, Michigan, Minnesota, and Wisconsin." michigan.gov/documents/leo/REV_Midwest_MOU_master_737026_7.pdf.

Relf, G., E. Cooper, R. Gold, and A. Goyal. 2020. *The 2020 Utility Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u2004.

Rhode Island Department of Administration. 2020. "Long Range Transportation Plan Documents." www.planning.ri.gov/planning-areas/lrtp/documents.php.

Samarripas, S., K. Tanabe, A. Dewey, A. Jarrah, B. Jennings, A. Drehobl, H. Bastian, S. Vaidyanathan, D. Morales, A. Patronella, S. Subramanian, and C. Tolentino. 2021. *The 2021 City Clean Energy Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u2107.

Sciortino, M., M. Neubauer, S. Vaidyanathan, A. Chittum, S. Hayes, S. Nowak, M. Molina, C. Sheppard, A. Jacobson, C. Chamberlin, and Y. Mugica. 2011. *The 2011 State Energy Efficiency Scorecard.* Washington, DC: ACEEE. aceee.org/research-report/e115.

Shober, M. "North Carolina's HB 951: Improved but still problematic," 7 October 2021. Southern Alliance for Clean Energy. cleanenergy.org/blog/north-carolinas-hb-951-improved-but-still-problematic/.

Smith, C. 2021. "Virginia Becomes 13th State to Join the ZEV Program." *EV Hub*, March 25. EV HUB. atlasevhub.com/news/virginia-becomes-13th-state-to-join-the-zev-program/.

Specian, M., and R. Gold. 2021. *The Need for Climate-Forward Efficiency: Early Experience and Principles of Evolution*. Washington, DC: ACEEE. www.aceee.org/research-report/u2106.

Spieler, C. 2020. "Racism Has Shaped Public Transit, and It's Riddled with Inequities." *Urban Edge*, August 24. kinder.rice.edu/urbanedge/2020/08/24/transportation-racism-has-shaped-public-transit-america-inequalities.

State of Washington Office of the Governor. 2021. *Veto Message: H.R. 1287, AN ACT Relating to Preparedness for a Zero Emissions Transportation Future*. Olympia: State of Washington Office of the Governor. crmpublicwebservice.ofm.wa.gov/bats/attachment/vetomessage/b596874d-cab4-eb11-81b9-005056ba1db5.

Vaidyanathan, S., P. Huether, and B. Jennings. 2021. *Understanding Transportation Energy Burdens.* Washington, DC: ACEEE. aceee.org/white-paper/2021/05/understanding-transportation-energy-burdens.

Valentine, A. 2020. "'The Wrong Complexion for Protection.' How Race Shaped America's Roadways and Cities." *NPR*, July 5. www.npr.org/2020/07/05/887386869/howtransportation-racism-shaped-america.

Virginia General Assembly. 2020. *Virginia Clean Economy Act.* Richmond: Virginia General Assembly. lis.virginia.gov/cgi-bin/legp604.exe?ses=201&typ=bil&val=hb1526.

Washington Department of Commerce. 2021. "Clean Buildings Performance Standards." commerce.wa.gov/growing-the-economy/energy/buildings/clean-buildings-standards.

Washington State Legislature. 2019. *SB 5116, AN ACT Relating to Supporting Washington's Clean Energy Economy and Transitioning to a Clean, Affordable, and Reliable Energy Future*. Olympia: Washington State Legislature. app.leg.wa.gov/billsummary?BillNumber=5116&Initiative=false&Year=2019.

White House. 2021a. "FACT SHEET: Biden Administration Advances Electric Vehicle Charging Infrastructure." April 22. www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-biden-administration-advances-electric-vehicle-charging-infrastructure/.

———. 2021b. "FACT SHEET: President Biden Announces Steps to Drive American Leadership Forward on Clean Cars and Trucks." August 5. www.whitehouse.gov/briefing-room/statements-releases/2021/08/05/fact-sheet-president-biden-announces-steps-to-drive-american-leadership-forward-on-clean-cars-and-trucks/.

———. 2021c. "FACT SHEET: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies." April 22. whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies.

York, D. 2020. "8 Ways Efficiency Programs Can Retool During the Crisis and Plan for a Strong Recovery." June 19. aceee.org/blog-post/2020/06/8-ways-efficiency-programs-can-retool-during-crisis-and-plan-strong-recovery.

York, D., and M. Kushler. 2002. *State Scorecard on Utility and Public Benefits Energy Efficiency Programs: An Update*. Washington, DC: ACEEE. aceee.org/research-report/u023.

———. 2005. *ACEEE's 3rd National Scorecard on Utility and Public Benefits Energy Efficiency Programs: A National Review and Update of State-Level Activity*. Washington, DC: ACEEE. aceee.org/research-report/u054.

Appendix A. 2020 Natural Gas Efficiency Program Savings

State	2020 net incremental gas savings (MMTherms)	% of commercial and residential retail sales
California	159.6	2.23%
Michigan	64.2	1.33%
Minnesota*	28.4	1.18%
Rhode Island	3.2	1.06%
Massachusetts	23.8	1.00%
New Hampshire	1.6	0.95%
Arkansas	7.4	0.86%
Utah	10.2	0.83%
Oregon*	6.2	0.81%
District of Columbia	2.1	0.78%
Wisconsin	16.8	0.70%
Vermont	0.7	0.67%
Connecticut	6.0	0.58%
Illinois	35.3	0.56%
Delaware	1.3	0.50%
Oklahoma	4.6	0.43%
Maryland	6.4	0.42%
New Jersey*	15.1	0.40%
New York	28.2	0.38%
Colorado	7.3	0.36%
Washington*	4.9	0.33%
Maine*	0.4	0.31%
Indiana	6.8	0.30%

State	2020 net incremental gas savings (MMTherms)	% of commercial and residential retail sales
Montana*	0.5	0.09%
Florida*	0.6	0.08%
Nevada	0.5	0.07%
Pennsylvania*	1.9	0.05%
South Dakota*	0.1	0.03%
Alabama	0.0	0.00%
Alaska	0.0	0.00%
Georgia	0.0	0.00%
Hawaii	0.0	0.00%
Idaho	0.0	0.00%
Kansas	0.0	0.00%
Kentucky	0.0	0.00%
Louisiana	0.0	0.00%
Mississippi	0.0	0.00%
Missouri	0.0	0.00%
Nebraska	0.0	0.00%
North Dakota	0.0	0.00%
Ohio	0.0	0.00%
South Carolina	0.0	0.00%
Tennessee	0.0	0.00%
Texas	0.0	0.00%
Virginia	0.0	0.00%
West Virginia	0.0	0.00%

Arizona*	2.2	0.29%
New Mexico	1.5	0.24%
Iowa*	2.0	0.17%
North Carolina	1.4	0.11%
Wyoming	0.0	0.00%
U.S. total	451.34	0.55%
Median	1.32	0.17%

Savings data were reported by contacts at public utility commissions unless otherwise noted. All sales data are from EIA (EIA 2021d). * At least a portion of natural gas savings were reported as gross; we adjusted the gross portion by a net-to-gross factor of 0.867 to make it comparable with net savings figures reported by other states.