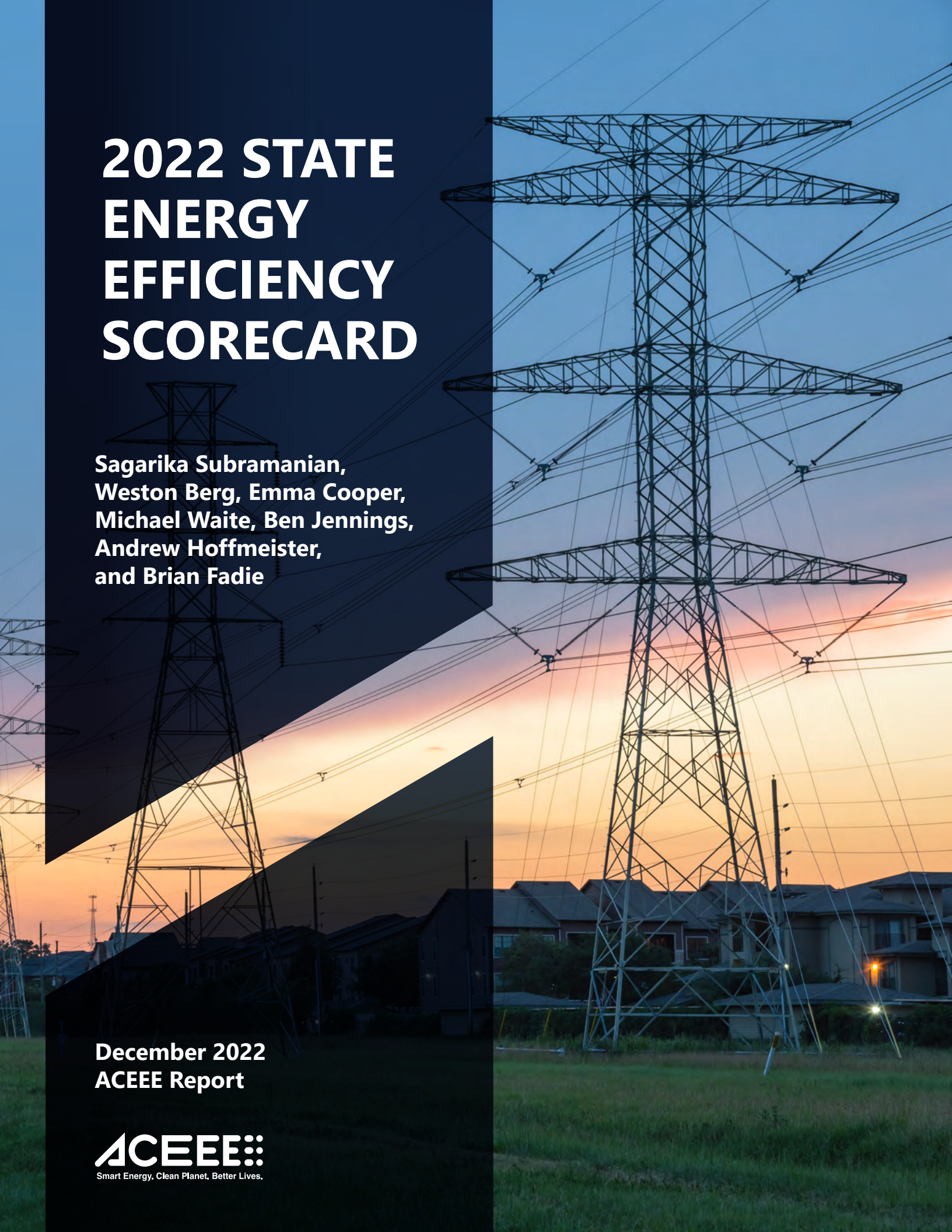
2022 STATE ENERGY EFFICIENCY SCORECARD

Sagarika Subramanian, Weston Berg, Emma Cooper, Michael Waite, Ben Jennings, Andrew Hoffmeister, and Brian Fadie



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ACEEE Report

ACEEE
Smart Energy. Clean Planet. Better Lives.

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 a just and equitable clean energy future.

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Executive Summary

KEY FINDINGS

- This report ranks U.S. states on their policy and program efforts to save energy, advance equity, and pursue efficiency as a cost-effective, critical tool for reducing emissions and meeting state clean energy goals.
- First place in the *State Scorecard* goes to **California**, for the second year in a row. The Golden State serves as a leader for other states by saving energy on multiple fronts with adoption of advanced clean energy building codes, stringent vehicle emissions standards, and industry-leading appliance standards. Another 17 states and the District of Columbia have adopted California's low-emissions vehicle regulations. California recently approved the Advanced Clean Cars II rule, which will help the state meet its carbon neutrality targets. The rule, if adopted by other states, will greatly grow the zero-emission vehicle market and deliver significant clean air and climate benefits.
- Rounding out the top 10 are Massachusetts (#2), New York (#3), Vermont (#4), Maine (#5), the District of Columbia (#6), Maryland and Rhode Island (tied at #7), Connecticut (#9), and Minnesota (#10).
- Regional leaders included California (#1) in the West, Massachusetts (#2) in the Northeast, Minnesota (#10) in the Midwest, Colorado (#13) in the southwest, and Virginia (#20) in the southeast. Each of these states has also signed sweeping clean energy legislation in recent years and strengthened its climate goals, which they are working to achieve with the help of expanded energy efficiency.
- We increased our *Scorecard's* focus on equity by adding 10 new scoring categories distributed across all policy areas to ensure that state leaders are also leading on equity. Almost all of our overall leaders scored well on equitable programs and policies. However, there is room for improvement: 34 states scored less than half the points available for equity-related metrics across all policy areas. No state scored all three points on equity-related metrics in the buildings chapter, indicating that more needs to be done to advance affordable, healthy, and decarbonized housing.
- This year's most improved state was **Maine**. Maine signed laws to promote electrification and decarbonization for affordable housing and continues to invest in weatherization and heat pump incentive programs. The state has also developed a Clean Transportation Roadmap to equitably advance electric vehicle adoption. Last year, Maine adopted energy- and water-saving standards for more than 15 types of products.
- South Carolina fell the farthest in rankings due to policies that discourage the use of efficiency funds for fuel switching as well as restrictions for jurisdictions adopting a more stringent energy code than the statewide code. South Carolina

also lost points for not having equitable planning or processes for state-government initiatives.

- Nationwide, annual savings from ratepayer-funded electric efficiency programs dipped slightly lower (2.43%) compared to last year's results, totaling approximately 26 million megawatt-hours. These savings are equivalent to 0.68% of total retail electricity sales in the United States in 2021, enough to power almost 2.4 million homes for a year.

The *State Energy Efficiency Scorecard*, now in its 15th edition, ranks states on their policy and program efforts.[1] It assesses performance, documents best practices, and recognizes leading efficiency strategies deployed by states. Energy efficiency has multiple benefits: it saves residents money, creates jobs, protects health and comfort by reducing pollution, and offers a vital strategy for states to reduce their greenhouse gas (GHG) footprints in a massive way. Motivated by the growing urgency of the climate crisis, many states have doubled down on climate pledges by adopting increasingly ambitious clean electricity standards and/or GHG emissions reduction goals. ACEEE analyses have determined that the United States can slash its projected energy use approximately 50% by 2050 through an economy-wide suite of energy efficiency measures including zero-energy homes, building retrofits, industrial energy efficiency, and vehicle fuel economy.[2]

States will find it difficult to meet their climate and clean energy goals without clear inclusion of energy efficiency in their policies.[3][4] States are also trying to advance equitable energy efficiency policies and programs. Certain groups of people and communities, such as Black and Indigenous communities, people of color, low-income households, and renters, have

[1] The report considers programs and policies adopted as of July 2022. However, scores for some performance-based categories, such as those in Chapter 2 (utility programs), were determined by the latest available data from 2021 program years.

[2] S. Nadel. *Pathway to Cutting Energy Use and Carbon Emissions in Half*. (Washington, DC: ACEEE, 2016); S. Nadel, and L. Unger. *Halfway There: Energy Efficiency Can Cut Energy Use and Greenhouse Gas Emissions in Half by 2050*. (Washington, DC: ACEEE, 2019).

[3] W. Berg, E. Cooper, and M. Molina. *Meeting State Climate Goals: Energy Efficiency Will Be Critical.* (Washington, DC: ACEEE, 2022).

[4] ACEEE published a roadmap with guidance for policymakers to navigate the shift toward climate-forward efficiency, which is a framework to equitably align energy efficiency and decarbonization goals in state and utility portfolios. The roadmap includes a menu of actions encompassing a vision of what climate-forward efficiency looks like for utilities and policymakers (M. Specian, R. Gold, and J. Mah. *A Roadmap for Climate-Forward Efficiency*. (Washington, DC: ACEEE, 2022).

historically been underserved by energy efficiency programs and experience disproportionate energy burdens compared to their counterparts.[5] Equitable clean energy policies, processes, and programs can reduce energy burdens, address barriers to access, and improve health and environmental effects for these populations. The *2022 State Scorecard* attempts to recognize and highlight ways in which states can incorporate and bolster equitable planning and decision-making.

Amid escalating energy prices and continued extreme weather events from climate change, state policymakers amped up efforts in 2022 to scale up efficiency programs and slash emissions. States are also recognizing the importance of an equitable energy transition by expanding investment for low-income households, conducting needs assessments of underserved communities, and setting energy burden reduction goals. Major bills focusing on efficiency and climate came out of Maryland, Massachusetts, and Washington. Maryland passed the Climate Solutions Now Act, which commits the state to net-zero GHG emissions by 2045 and includes provisions to decarbonize equitably. Move Ahead Washington (SB 5974) sets a target stating that all passenger and light-duty vehicles of model year 2030 must be electric vehicles. It also adds billions of dollars of funding for public transportation, carbon reduction and multimodal expansion, and walking and biking infrastructure in underinvested communities.

Various states also advanced more efficient building energy codes in 2022, many with long-term goals to establish net-zero-energy construction codes in coming years. The District of Columbia's Clean Energy DC Building Code Act requires that all new commercial buildings be net-zero energy by 2026. Several states have adopted the 2018 International Energy Conservation Code (IECC) since the *2020 State Scorecard*, but only two states—Connecticut and Montana—have adopted the 2021 IECC. As part of its ambitious Climate Solutions Now Act, Maryland became the third state to adopt a building performance standard (BPS) requiring that many categories of large buildings reduce their GHG emissions 20% between 2025 and 2030.

In addition, a growing number of states are embracing California's low- and zero-emission vehicle (ZEV) rules. Minnesota, Nevada, and New Mexico recently adopted the Golden State's clean car rules. In August, California updated its ZEV program with the intention of removing internal combustion engine vehicles from the road by 2035. If other ZEV states adopt this program, it would help meet federal transportation electrification goals. Nine states and the District of Columbia are working to ensure that these electrification efforts are equitable by establishing dedicated funding to install charging equipment in low-income and underserved communities.

[5] *Energy Equity.* (Washington, DC: ACEEE) www.aceee.org/topic/energy-equity.

This year was also successful for state appliance standards. Maryland, New Jersey, Oregon, and Washington have passed efficiency standards for up to 17 types of products, and New York is expected to adopt appliance standards through a rulemaking process by the end of 2022. By establishing minimum efficiency thresholds for common home and office products such as lighting, electronic devices, and plumbing fixtures, these state standards have been critical to helping consumers save on utility bills and reduce GHG emissions. Additionally, California and Vermont are the first two states to enact a clean lighting policy that stops the sale of fluorescent light bulbs containing mercury. These will be replaced with more efficient light-emitting diode (LED) bulbs that are mercury-free, leading to even more energy and emissions savings for both states.

POLICY AREAS

The *Scorecard* compares states across six policy areas:

- Utility and public benefits programs and policies
- Transportation policies
- Building energy efficiency policies
- State-government-led initiatives around energy efficiency
- Industrial energy efficiency policies
- Appliance and equipment standards

New this year, the *State Scorecard* also includes 10 equity-focused scoring categories across policy areas to ensure that state leaders are also enacting equitable clean energy policies, processes, and programs. ACEEE defines energy equity based on four dimensions of equity: procedural, distributional, structural, and transgenerational.[6] Among other metrics, our new framework considers state efforts to strengthen community engagement processes, compensate frontline communities and community-based organizations for participating in energy proceedings, improve tracking of energy equity-related data, and ensure equitable distribution of clean energy benefits.

Table ES1 provides examples of states that have adopted best-practice policies in each area. For more information about leading states, refer to the *Scorecard* chapter corresponding to the relevant policy area.

[6] These dimensions were defined in a 2014 report, *Equity in Sustainability,* by Angela Park and others at the Urban Sustainability Directors Network. More details on the definition of energy equity used in ACEEE's research and on the dimensions of energy equity that guide our research can be found at www.aceee.org/topic/energy-equity.

Table ES1. Examples of states adopting best-practice policies

Chapter number/Area	Example states	Achievements
2. Utility and public benefits	California, District of Columbia, Massachusetts, Maine, Vermont	All have strong investment in utility and state low-income energy efficiency programs, and all have adopted policies to support equitable energy planning.
3. Transportation	California, Massachusetts, New York, Oregon, Washington	Each of these states has adopted California's vehicle emissions standards, its zero-emission vehicle (ZEV) program, and its Advanced Clean Truck (ACT) rule, and each has adopted goals to reduce vehicle miles traveled (VMT) or transportation-related greenhouse gases (GHGs).
4. Building energy efficiency	Massachusetts, Colorado, Nebraska, Nevada, New Jersey, New Mexico, New York, Oregon, Washington, Vermont	These states have strengthened efficiency standards for new construction by adopting building energy codes aligned with or stronger than 2018 IECC or ASHRAE 90.1-2016; they have also devoted resources to assessing code compliance. Colorado and Washington adopted building performance standards.
5. State government initiatives	California, Massachusetts, Oregon, Rhode Island	These states led this year in offering loan and grant programs to spur energy savings, setting efficiency standards for public buildings and fleets, and possessing a dedicated equity task force and an energy affordability/justice goal.
6. Industry energy efficiency	Connecticut, Massachusetts, Minnesota, Washington	All of these states have programs that offer technical assistance for energy

Chapter number/Area	Example states	Achievements
		management and industrial workforce training, and that have either an industrial decarbonization target or a clean heat standard.
7. Appliance/equipment standards	Maryland, New Jersey, New York, Oregon, Washington	Each of these states passed appliance standards since 2022 that are expected to save consumers hundreds of millions of dollars on utility bills.
Equity-focused scoring categories	California, Massachusetts, New York, Connecticut, District of Columbia	These states have utilities that track and report equity-related program data or special cost-effectiveness screening provision for low-income programs. They also have programs for electrification in affordable housing and encourage equitable transportation electrification.

SCORES

Figure ES1 below shows the states' rankings, divided into five tiers for ease of comparison. Table 3 in Chapter 1 provides details of each state's scores.

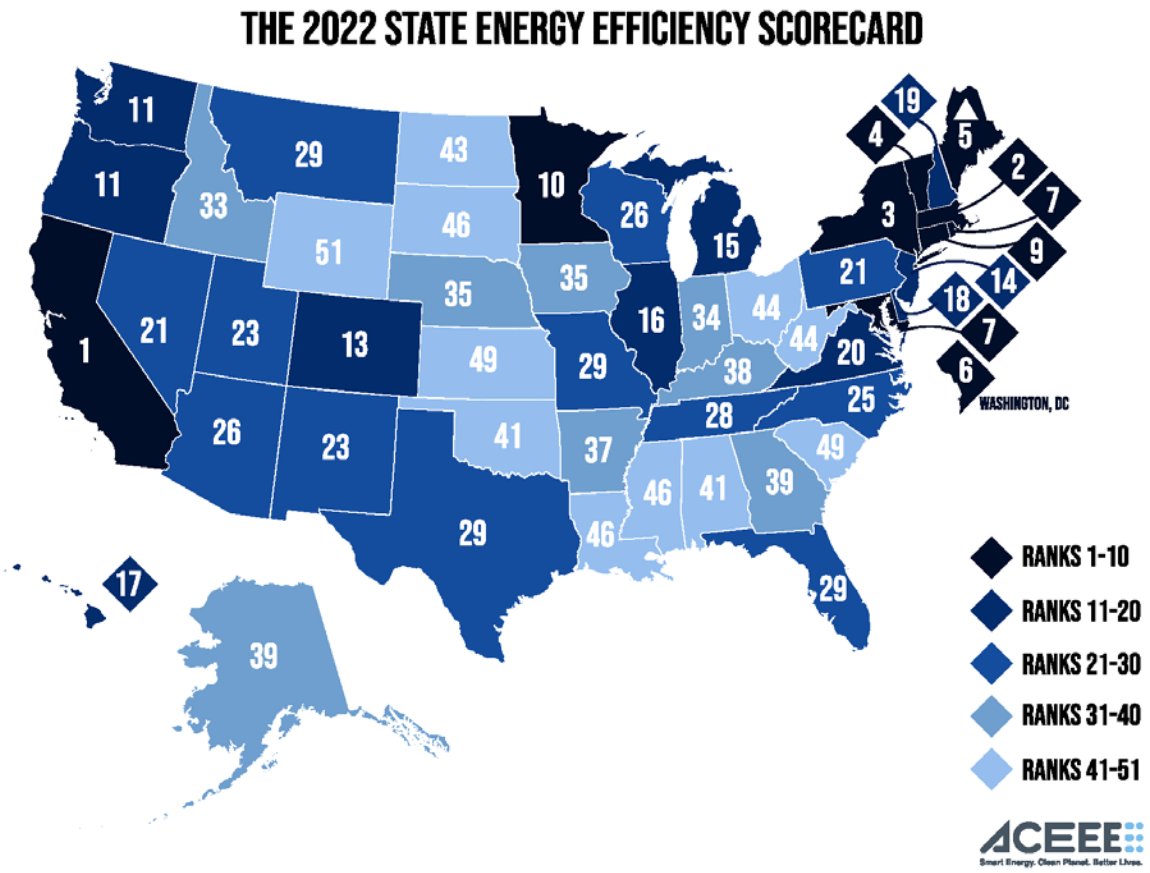

Figure ES1. 2022 State Energy Efficiency Scorecard rankings

REGIONAL HIGHLIGHTS

For the second time, the *2022 State Scorecard* ranks states not only nationally but also regionally, making it possible to compare states that have shared geographies and similar climatic conditions. This allows states to assess how their progress on energy efficiency compares to that of their neighbors. Figure ES2 shows the top states and states to watch by region.

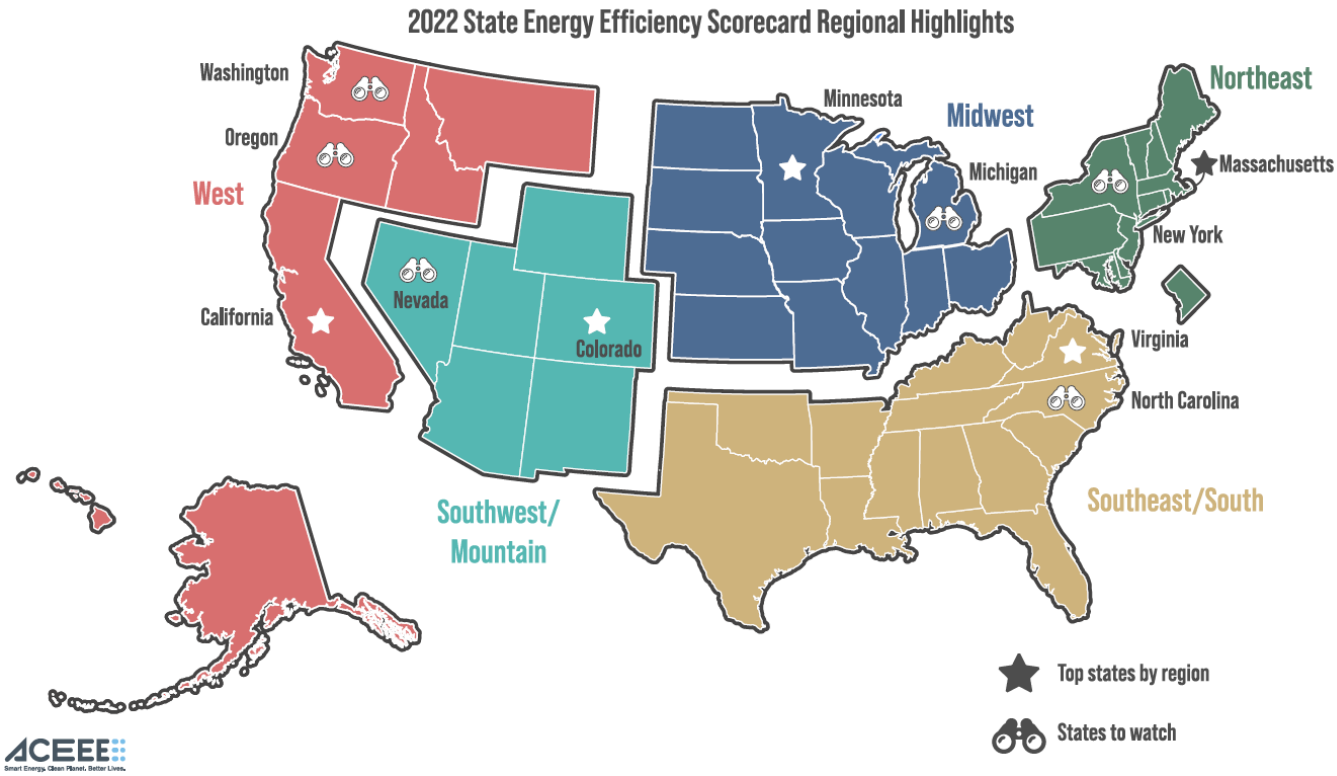

Figure ES2. 2022 State Scorecard regional highlights. Regional "states to watch" have ranked highly in their region and offer promising models for their neighbors.

STRATEGIES FOR IMPROVING ENERGY EFFICIENCY

State officials have access to a variety of policy tools and program designs to scale up energy savings across multiple use sectors; this allows them to deliver immense carbon savings to help meet U.S. climate goals. These programs also provide an important opportunity to help reduce home and business energy bills, generate employment, and decrease the need for imported energy 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 that expand participation in programs that achieve savings.

Establish and adequately fund an energy efficiency resource standard (EERS) 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. The policies serve as an enabling framework for cost-effective investment, savings, and program activity. To address evolving priorities such as decarbonization, cost, equity, and grid value, regulators in places such as Massachusetts and New York are adjusting targets to incorporate multiple goals (e.g., fuel-neutral savings) that better align efficiency programs with electrification, GHG reduction objectives, and equitable outcomes.

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 accounts for 27% of the total U.S. GHG emissions and therefore offers a significant opportunity to reduce overall emissions.[7] At the state level, a comprehensive approach to transportation energy efficiency must address both individual vehicles and the entire transportation system. State-level policy options include codifying targets for reducing VMT and integrating land use and transportation planning to create communities where people can access multiple modes of travel and need not rely on owning personal vehicles. 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

[7] EPA. "Sources of Greenhouse Gas Emissions." (May 2020); accessed July 2022. epa.gov/ghgemissions/sources-greenhouse-gas-emissions

Ensure energy efficiency and clean energy investments and opportunities are inclusive and that benefits accrue to all communities, especially households overburdened by energy costs. Historically marginalized groups have been underserved and underrepresented in clean energy planning and policymaking. States must foster equity in key decision-making processes by ensuring that these efforts are inclusive and designed directly with community members. Efforts to prioritize equity could include establishing internal metrics and frameworks that evaluate the degree of equity in policy and program outcomes, developing stakeholder processes and community assessments to better understand the needs of marginalized groups, and adopting inclusive workforce development practices to offer new economic and educational opportunities for groups often underrepresented in the energy efficiency workforce. States can also strengthen incentives and programs for income-qualified customers, and work with utilities and regulators to recognize, value, and expand program nonenergy benefits (NEBs), such as health and economic improvements. States, utilities, and public utility commissions can also include goals specific to low-income communities, either within an EERS or as a stand-alone minimum acceptable threshold, to ensure that investments are targeted toward these customers.

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

Adopt updated energy-efficient building energy codes, improve code compliance, involve efficiency program administrators in code support, and adopt a BPS. Buildings use almost 40% of the total energy consumed in the United States, making them an essential target for cutting energy waste and emissions.[8] 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 and for major renovations. Additional strategies can encourage deep retrofits; these strategies include BPS for existing buildings, benchmarking and transparency policies, and financing mechanisms (such as energy efficiency as a service). These approaches are also critical for improving efficiency in the existing building stock and reducing building carbon emissions.

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

Expand state-government-led initiatives and make them visible. States can establish annually sustained funding sources for energy efficiency incentive programs. To lead by example, they can incorporate energy efficiency into government activities by reducing

[8] U.S. Energy Information Administration. "How much energy is consumed in U.S. buildings?" July 11, 2022. eia.gov/tools/faqs/faq.php?id=86&t=1.

energy use in public buildings and fleets and by using energy savings performance contracts to finance energy-saving projects. States can also work with utilities and community-based organizations to promote and coordinate 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 up-front 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 implementing 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 Commercial Property Assessed Clean Energy programs and green banks.

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

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 without federal standards, adoption by even a few states can be enough to impact national markets. In 2020, the Appliance Standards Awareness Project outlined a menu of new or strengthened standards for 47 products that would reduce annual average household utility bills by more than $100 in 2030, as well as deliver cumulative utility bill savings of $1.1 trillion through 2050 for consumers and businesses.[9]

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

[9] Appliance Standards Awareness Project, *A Powerful Priority: How Appliance Standards Can Help Meet U.S. Climate Goals and Save Consumers Money* (Boston: ASAP, 2020). appliance-standards.org/sites/default/files/Powerful_Priority_Report.pdf.

Chapter 1. Introduction, Methodology, and Results

Author: Sagarika Subramanian

The *State Energy Efficiency Scorecard*, now in its 15th edition, ranks states on their policy and program efforts to advance energy efficiency in service of decarbonization. It assesses performance, documents best practices, and recognizes leadership. The report captures the latest policy developments and state efforts to save energy and highlights opportunities and policy tools available to governors, state legislators, and regulators.

With states increasingly adopting ambitious climate goals and increasing energy efficiency's role in decarbonization, ACEEE has reimagined the *State Scorecard* with an expanded suite of scoring metrics that align with new and emerging state climate priorities. ACEEE is also actively seeking opportunities to highlight ways in which states can incorporate and strengthen equity in energy planning and decision-making. In recognizing the potential for energy savings to reduce energy bills for households and businesses, create jobs, and reduce emissions, states are advancing efficiency across sectors to meet climate goals and create an equitable energy transition inclusive of all communities.

The new equity metrics for the *2022 Scorecard* were developed as part of ACEEE's Leading with Equity Initiative, which aims to ensure that equity concerns are centered in all ACEEE *Scorecards,* and that top scorers are leading on equity (ACEEE 2022a). Our new methodology considers state efforts to strengthen community engagement processes, provide compensation for marginalized communities to participate in energy proceedings, improve tracking of energy-equity-related data, and ensure equitable distribution of clean energy benefits. We provide further details on changes in our methodology and scoring in the sections that follow.

Although prices for renewable electricity continue to decline, energy efficiency remains our nation's least-cost energy resource while also delivering additional benefits such as grid reliability and resilience. In 2021, states reported utility spending on energy efficiency amounting to roughly $7.7 billion. Electricity savings levels dipped by 2.4% compared to 2020, totaling approximately 26 million megawatt-hours (MWh)—enough to power almost 2.4 million homes for a year. Many states and utilities reported efforts to grow and adapt program portfolios to look beyond lighting measures, targeting deep energy home retrofits, smart buildings, expansion of electric vehicle (EV) infrastructure, zero-energy buildings, and electrification of space and water heating.

In 2022, work continued on a number of important clean energy bills and rulemakings, including important efficiency-related policy achievements in Maryland, Massachusetts, and Connecticut. In the wake of rapidly rising energy prices and electricity bills, several states are recognizing energy efficiency's important role in keeping energy affordable by helping homeowners and businesses reduce costs, by improving living conditions, and by creating jobs, all while supporting increasingly ambitious state and local goals to reduce carbon emissions. This report seeks to capture and highlight those efforts.

The *Scorecard* is divided into eight chapters. In this chapter, we discuss our scoring methodology, including changes made to align with the Leading with Equity Initiative. We then present the overall results of our analysis and introduce strategies that states can use to improve their energy efficiency. We conclude the chapter by spotlighting leading states, most-improved states, and policy trends underlying the rankings.

Subsequent chapters present detailed results for six major policy areas. Chapter 2 covers utility and public benefits programs and policies. Chapter 3 discusses transportation policies. Chapter 4 deals with building energy code adoption, state code compliance efforts, and building policies. Chapter 5 discusses state government initiatives, including financial incentives, lead-by-example policies, and equitable practices. Chapter 6 is a new addition to the *State Scorecard;* in it, we cover industrial energy efficiency policies. We then describe appliance and equipment efficiency standards in Chapter 7.

In the final chapter, we summarize major policy highlights and setbacks occurring since we released the previous *Scorecard* and describe data limitations that we encountered in our research. We also describe emerging energy efficiency trends that we hope to address with new metrics in future *Scorecard*s.

SCORING

States are the testing grounds for policies and regulations that may ultimately be adopted at the federal level or by other states, thus having a wider impact on energy savings and emissions. To reflect the enormous diversity of the United States, we chose metrics that are flexible enough to capture the range of policy and program options that states use to encourage energy efficiency. The policies and programs we evaluate in the *State Scorecard* aim to reduce end-use energy consumption, set long-term commitments for energy efficiency and equitable decarbonization, and establish mandatory performance codes and standards. These policies and programs also help to accelerate adoption of the most energy-efficient technologies; reduce market, regulatory, and information barriers to energy efficiency; and provide funding for efficiency programs.

We evaluated states in the six primary policy areas in which they are pursuing energy efficiency:

- Utility and public benefits programs and policies[10]
- Transportation policies
- Building energy efficiency policies

[10] A public benefits fund provides long-term funding for energy efficiency initiatives, usually through a small surcharge on electricity consumption on customers' bills.

- State-government-led initiatives around energy efficiency
- Industrial energy efficiency policies
- Appliance and equipment standards

In prior *State Scorecard* editions, we allocated points among the policy areas to reflect the relative magnitude of energy savings possible through the measures scored. However, this approach sometimes overlooks certain efficiency technologies that have great carbon savings benefits, such as vehicle electrification and building decarbonization through energy-efficient heat pumps. For the *2022 Scorecard,* we allocated points to align with recent findings from ACEEE and others that highlight best-practice energy efficiency policies that offer the greatest potential to deliver greenhouse gas (GHG) emissions savings that support clean energy and emissions reduction goals (Nadel and Ungar 2019; Larson et al. 2020; Williams et al. 2021; IEA 2021; NASEM 2021).

The new methodology also includes a total of 10 new equity-focused metrics across policy areas, increasing the equity focus from 4% of total points in the *2020 State Scorecard* to 20% in this edition. More details about our process and commitment to centering equity in the *State Scorecard* can be found in ACEEE's State Scorecard Equity Metrics Implementation Strategy (ACEEE 2022a).

Of the 50 total points possible, we allocated 15 points (30%) to utility and public benefits program and policy metrics; 13 points (26%) to transportation policies and programs; 12 points (24%) to building energy efficiency policies; 4.5 points (9%) to state-led initiatives (such as lead-by-example programs and state-sponsored incentives); 2.5 points (5%) to industrial energy efficiency policies; and 3 points (6%) to state appliance and equipment standards.

In each policy area, we developed a scoring methodology based on a diverse set of criteria that we detail in each policy chapter. We used these criteria to assign a score to each state. The scores were informed by responses to data requests sent to state energy officials, public utility commission (PUC) staff, and experts in each policy area. To the best of our knowledge, policy information included in this report is current as of July 2022. However, some performance-based scoring categories, such as those in Chapter 2 (utility programs), are informed by the latest available data from 2021 program years.

Table 1 outlines the new scoring allocation and includes the 16 new metrics for the *2022 Scorecard*.

Table 1. Scoring by policy area and metrics

Policy areas and metrics	Maximum score	% of total points
Utility and public benefits programs and policies	15	30%
Incremental savings from electricity efficiency programs	5	10%

Policy areas and metrics	Maximum score	% of total points
Incremental savings from natural gas and fuels efficiency programs	2.5	5%
Spending on electricity efficiency programs	Potential bonus point for notable increase in spending	
Spending on natural gas efficiency programs	Potential bonus point for notable increase in spending	
Energy efficiency resource standards (EERS)	2	4%
Performance incentives and fixed-cost recovery	2	4%
(New) Inclusion of nonenergy benefits (NEBs) in cost-effectiveness (C/E) tests	0.5	1%
Support of low-income energy efficiency programs	2	4%
(New) Geographic tracking of distribution of program participation and health/pollution impacts	0.5	1%
(New) Intervenor compensation	0.5	1%
Transportation policies	**13**	**26%**
GHG tailpipe emissions standards	1	2%
Zero-emission vehicle (ZEV) mandate	1	2%
Electric vehicle (EV) registrations	1	2%
EV fees	0.5	1%
Electric vehicle supply equipment (EVSE)	1	2%
High-efficiency vehicle consumer incentives	0.5	1%
Targets to reduce vehicle miles traveled (VMT)	1	2%
Change in VMT	1	2%
Integration of transportation and land-use planning	1	2%
Transit funding	1.5	3%
Transit legislation	0.5	1%
Freight system efficiency goals	1	2%
Equitable transportation access	1	2%
(New) Equitable transportation electrification	1	2%
Building energy efficiency policies	**12**	**24%**
Level of code stringency	4	8%

Policy areas and metrics	Maximum score	% of total points
(New) Stretch code adoption	1	2%
Code compliance study	1	2%
(New) Fuel-switching enabling policies	1	2%
Energy transparency policies	0.5	1%
Existing buildings standards	1	2%
Zero-energy buildings (ZEBs)	0.5	1%
(New) Minimum energy performance standards for state housing-agency-funded projects	1	2%
(New) State efforts to remediate health/safety deficiency barriers to weatherization in low-income households	1	2%
(New) ZEBs and electrification in affordable housing/construction	1	2%
State government initiatives	**4.5**	**9%**
Financial incentives	1	2%
Lead-by-example efforts in state facilities and fleets	1	2%
Carbon pricing	0.5	1%
(New) Dedication of carbon pricing revenues to energy efficiency equity initiatives	0.5	1%
(New) Statewide emission reduction goal	0.5	1%
(New) Statewide energy affordability or energy justice goal	0.5	1%
(New) Equity task force or dedicated staff for equity concerns	0.5	1%
Industry energy efficiency policies	**2.5**	**5%**
(New) Statewide strategic energy management (SEM) program	1	2%
(New) Industrial decarbonization target or clean heat standard	1	2%
Large-customer opt-out programs*	Potential penalty up to -1 point	
(New) State-supported job training for industrial energy efficiency	0.5	1%

Policy areas and metrics	Maximum score	% of total points
Appliance and equipment efficiency standards	3	6%
Maximum total score	*50*	*100%*

*** We deduct points for programs and policies that are detrimental to energy efficiency**

The *State Scorecard* is meant to reflect the current policy landscape, incorporating changes from year to year. This year, we made significant changes to focus on states' climate-related efforts and efforts that promote equitable access to clean energy and efficiency investments. Moving forward, we will continue to adjust our methodology to ensure that the *State Scorecard* captures state energy efficiency policies and programs that promote equitable decarbonization.

STATE DATA COLLECTION AND REVIEW

We rely on outreach to state-level stakeholders to verify the accuracy and comprehensiveness of the policy information that we use to score the states. As in past years, we asked each state utility commission to review statewide data for the customer-funded energy efficiency programs presented in Chapter 2. This year, 32 state commissions responded.

We also asked each state energy office to review information on transportation policies (Chapter 3), building energy codes (Chapter 4), state government initiatives (Chapter 5), and industrial energy efficiency policies (Chapter 6).

We received responses from energy offices in 40 states. We gave state energy office and utility commission officials the opportunity to review and submit updates to the material in ACEEE's State and Local Policy Database (ACEEE 2020b).[11] We also asked them to review and provide comments on a draft version of this *Scorecard* prior to publication. To evaluate states that did not respond to this year's data requests, we used publicly available data and responses from prior years.

In collaboration with our Leading with Equity initiative, we expanded our external reviewers list to include local, regional, and national organizations focused on environmental justice.

[11] Available at database.aceee.org.

Data Limitations

Any effort to convert state spending data, energy savings data, and adoption of best-practice policies across six policy areas into a single state energy efficiency score has obvious limitations. One of the most pronounced is access to recent, reliable data on the results of energy efficiency. Because many states capture relatively little data on energy efficiency policy efforts and use various reporting protocols, we used a best-practices approach to score some policy areas. However, the actual, measurable success of these codes in reducing energy consumption is unclear without ways to verify implementation. As data become more readily available, we will continue to explore ways to incorporate a more quantitative assessment of compliance in future *Scorecard*s.

We face similar difficulty in scoring state-backed financing and incentive programs for energy efficiency investments. Though many states have seemingly robust programs aimed at residential and commercial consumers, savings data from these programs are rarely tracked in a comprehensive or standardized manner that would allow straightforward comparisons between states. As a result, we can offer only a qualitative analysis of these programs. This lack of quantitative data is growing more pronounced as many states begin pouring financial resources into green banks. Without comparable results on dollars spent and rigorously evaluated energy savings, it is impossible to assess these programs with the same scrutiny that we use to evaluate utility programs.

Best-Practice Policy and Performance Metrics

The scoring framework described above is our best attempt to represent our more than 40 efficiency and equity metrics as a quantitative score. Converting spending data, energy savings data, and policy adoption metrics spanning six policy areas into one score clearly involves simplification. Quantitative energy savings performance metrics are confined primarily to programs run by utilities and statewide or third-party administrators using ratepayer funds. These programs are subject to strict evaluation, measurement, and verification (EM&V) standards. States engage in many other efforts to encourage efficiency, but such efforts are typically not evaluated with the same rigor, so it is difficult to capture comprehensive quantitative data for these programs.

Although our preference is to include metrics based on energy savings and GHG emissions reductions achieved in every sector, the lack of consistent ex post data makes this unrealistic. Therefore, except for utility policies, we have not scored the other policy areas on spending or reported savings attributable to a particular policy action. Instead, we have developed best-practice metrics for scoring the states. In most cases, these metrics do not score outcomes directly but rather credit states that are implementing equitable policies likely to lead to gains in energy efficiency. For example, we give credit for *potential* energy savings from improved building energy codes and appliance efficiency standards, since *actual* savings from these policies are rarely evaluated. We have also attempted to reflect outcome metrics to the extent possible; for example, EV registrations, reductions in vehicle miles traveled (VMT), and a metric for the number of publicly available EV charging ports all

represent measurable results of transportation policies. Each chapter includes a full discussion of the policy and performance metrics.

AREAS BEYOND OUR SCOPE: LOCAL AND FEDERAL EFFORTS

Energy efficiency initiatives implemented by actors at the federal or local level or in the private sector (with the exception of investor-owned utilities, municipal-owned utilities, and cooperatives) generally fall outside the scope of this report. However, the $1 trillion available through the Infrastructure Investment and Jobs Act as well as federal funds from the 2021 American Rescue Plan Act offer states unprecedented levels of federal support for sustainable economic development and efforts to address climate change (Dewey, Mah, and Howard 2021). Billions of dollars from the recently passed Inflation Reduction Act will also help states invest in clean energy and energy efficiency in the buildings, transportation, and industrial sectors (117th Congress 2022). It is important to note that regions, counties, and municipalities have become actively involved in developing energy efficiency programs, a positive development that reinforces state-level efficiency efforts. ACEEE's *City Clean Energy Scorecard* (Samarripas et al. 2021) captures data on these local actions; we do not specifically track them in the *State Scorecard*. However, a few *State Scorecard* metrics do capture local-level efforts, including the adoption of building codes and land-use policies, as well as state financial incentives for local energy efficiency initiatives. We also include municipal utilities in our data set to the extent that they report energy efficiency data to the U.S. Energy Information Administration (EIA), state PUCs, or other state and regional groups. As much as possible, however, we focus on state-level energy efficiency activities.

The *State Scorecard* has not traditionally covered private-sector investments in efficient technologies beyond customer-funded or government-sponsored energy efficiency initiatives, codes, or standards. We do, however, recognize the need for metrics that capture the rapidly growing role of private financing mechanisms. We currently track states with active Property Assessed Clean Energy (PACE) programs, green bank financing, and loan programs offered by state agencies. However, incompleteness and variations in reporting program results have made development of a fair and transparent performance-based scoring metric a challenge. Until the reliability and completeness of savings data from these private initiatives improve, we award points for the presence of such programs but stop short of crediting levels of funding or savings. If this information was made available, we included it in Appendix J.

THIS YEAR'S CHANGES IN SCORING METHODOLOGY

We significantly expanded our scoring categories this year by adding 16 new metrics that reflect the evolving policy landscape of climate-related efforts and equity-centered energy efficiency. Of these metrics, 10 highlight policies and programs advancing equity in state energy efficiency initiatives. Our new framework also adjusts the sector-level point allocations, including minor increases to transportation and buildings. In addition, we added a new chapter on industrial energy efficiency to reflect industrial sectors' potential to deliver GHG emissions reductions through efficiency and electrification. Table 2 summarizes the metric additions and adjustments relative to the *2020 State Scorecard* methodology.

Table 2. Summary of metric additions and adjustments compared to the 2020 State Scorecard

Policy areas and metrics	2020 point allocation	2022 point allocation
Utility and public benefits programs and policies	20	15
Incremental savings from electricity efficiency programs	7	5
Incremental savings from natural gas and fuels efficiency programs	3	2.5
Spending on electricity efficiency programs	2.5	–
Spending on natural gas efficiency programs	1.5	–
Energy efficiency resource standards (EERS)	3	2
Performance incentives and fixed-cost recovery	2	2
Support of low-income energy efficiency programs	1	2
Policies to advance equitable utility-sector efficiency (0.5 pts. awarded for each of the following policies for a maximum of 1.5 pts): • Requirements for minimum level of state or utility support of low-income programs • Special cost-effectiveness screening provisions or exceptions for low-income programs • Inclusion of health/safety nonenergy benefits within cost-effectiveness tests (New) • Equity-focused program impact metrics (New) • Intervenor compensation (New)	Included in previous metric	1.5
Transportation policies	12	13
GHG tailpipe emissions standards	1.5	1
ZEV mandate	Included in metric above	1
Electric vehicle (EV) registrations	1	1
EV fees	1	0.5
Electric vehicle supply equipment (EVSE)	1	1
High-efficiency vehicle consumer incentives	0.5	0.5
Targets to reduce vehicle miles traveled (VMT)	1	1

Policy areas and metrics	2020 point allocation	2022 point allocation
Change in VMT	1	1
Integration of transportation and land-use planning	1	1
Transit funding	1	1.5
Transit legislation	0.5	0.5
Freight system efficiency goals	1	1
Equitable transportation access	1	1
(New) Equitable transportation electrification	–	1
Building energy efficiency policies	**9**	**12**
Level of code stringency	4	4
(New) Stretch code adoption	–	1
Code compliance study	1	1
(New) Fuel-switching enabling policies	–	1
Energy transparency policies	1	0.5
Existing buildings standards	1	1
Zero-energy buildings (ZEBs)	0.5	0.5
(New) Minimum energy performance standards for state housing-agency-funded projects	–	1
(New) State efforts to remediate health/safety deficiency barriers to weatherization in low-income households	–	1
(New) ZEBs and electrification in affordable housing/construction	–	1
State government initiatives	**6**	**4.5**
Financial incentives	2.5	1
Lead-by-example efforts in state facilities and fleets	2	1
Carbon pricing	1.5	0.5
(New) Dedication of carbon pricing revenues to EE equity initiatives	–	0.5
(New) Statewide emission reduction goal	–	0.5
(New) Statewide energy affordability or energy justice goal	–	0.5
(New) Equity task force or dedicated staff for equity concerns	–	0.5

Policy areas and metrics	2020 point allocation	2022 point allocation
Industry energy efficiency policies	–	2.5
(New) Statewide strategic energy management (I-SEM) program	–	1
(New) Industrial decarbonization target or clean heat standard	–	1
Large-customer opt-out programs*	–	Potential penalty up to –1 point
(New) State-supported job training for industrial EE	–	0.5
Appliance and equipment efficiency standards	3	3
Maximum total score	50	50

*** We deduct points for programs and policies that are detrimental to energy efficiency**

Historically, the *State Scorecard* has allocated the maximum number of points to the utility sector. Our new methodology aims to redistribute points based on each sector's potential to achieve GHG savings and energy savings. Because the transportation sector provides the greatest potential for GHG savings, we reduced the maximum number of points a state can earn on utility programs and policies. Unlike past *Scorecards*, we decided to stop scoring state utility spending on energy efficiency programs, concentrating instead on incremental energy savings achieved. In addition, states could receive a bonus point for notable increases in spending. This year, we also added three new metrics related to equity-driven utility practices. We credited states that include nonenergy benefits such as health and safety in cost-effectiveness tests; transparently tracking and reporting equity-focused program data; and offering intervenor compensation for communities participating in utility proceedings.

Chapter 3 (transportation policies) includes a new metric relating to equitable EV deployment. States received 1 point if they had a dedicated funding stream for the installation of EV charging equipment in low-income, environmental justice, or underserved communities.

Chapter 4 (buildings policies) includes new metrics that credit statewide stretch codes and policies enabling beneficial electrification. Stretch codes allow local jurisdictions to go beyond the provisions in the state's base code. We deducted points for states with restrictions or policy barriers for adopting energy codes that are more stringent than the statewide energy code. We also recognized states for adopting policies that enable the use of energy efficiency funds for fuel-switching measures. Finally, we acknowledge state efforts to encourage healthy, affordable, and efficient housing, adding three new metrics in this policy area: minimum energy performance standards for state housing-agency-funded

projects; state efforts to remediate barriers to low-income weatherization; and state programs that target affordable housing for zero-energy buildings and electrification.

Chapter 5 (state-government-led initiatives) includes several new equity-focused metrics and points for states that have a statewide emissions reduction goal. The *2020 State Scorecard* credited states supporting energy efficiency programs through proceeds from carbon pricing policies—primarily through the Regional Greenhouse Gas Initiative (RGGI) and California's cap-and-trade program. We have built on this with a new metric crediting states that dedicate revenues to energy efficiency equity initiatives. We also assess whether states have an equity task force or staff dedicated to equity concerns. Lastly, we gave points to states with an energy affordability or energy justice goal.

Chapter 6 (state industrial energy efficiency policies) is a new chapter aimed at supporting decarbonization. Energy-related GHG emissions from the industrial sector continue to grow; they can be addressed partly through energy efficiency policies such as energy management, industrial decarbonization targets, and workforce development. The metrics in Chapter 6 aim to identify states that are implementing these types of policies while acknowledging that much more action needs to be taken. We recognize that the chosen metrics are limited in scope; we will continue to refine them for future editions of the *Scorecard* as more states enact policies to curb industrial emissions.

Finally, Chapter 7 (appliance and equipment efficiency standards) includes points this year for states with clean lighting policies. Such policies aim to end the sale of general-purpose fluorescent lighting, which contains mercury and is much less efficient than the light-emitting diodes (LEDs) that replace it.

2022 STATE ENERGY EFFICIENCY SCORECARD RESULTS

Figure 1 offers an overview of the *2022 State Scorecard* results, while table 3 describes them in more detail. In this section, we highlight key changes in state rankings, discuss which states are making notable new commitments to energy efficiency and equitable practices, and provide recommendations for states that want to increase their energy efficiency.

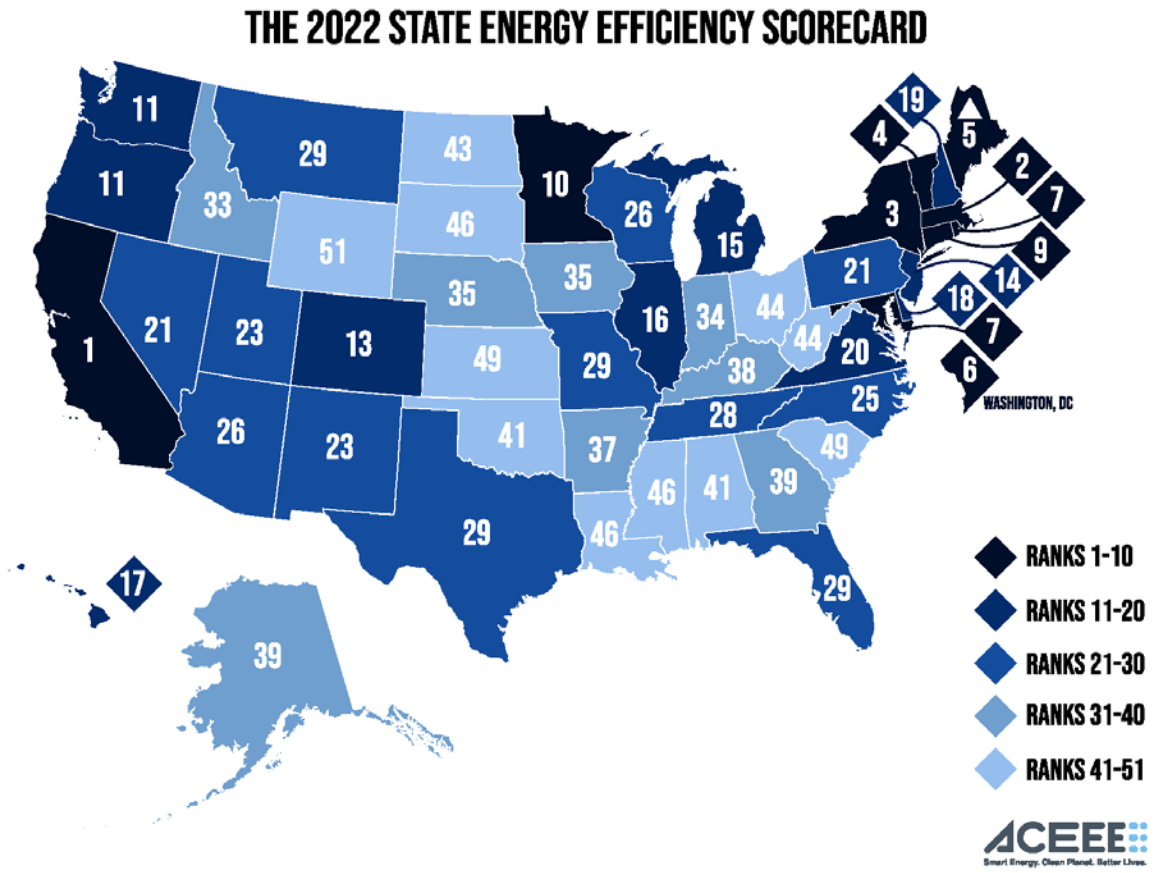

Figure 1. 2022 State Scorecard rankings

Table 3. Summary of state scores in the 2022 Scorecard

Rank	State	Utility and public benefits (15 pts.)	Transportation policies (13 pts.)	Building energy efficiency policies (12 pts.)	State government initiatives (4.5 pts.)	Industrial policies (2.5 pts.)	Appliance efficiency standards (3 pts.)	Total score (50 pts.)	Change in rank from 2020
1	California	15	12	10	4.5	2.5	3	47	0
2	Massachusetts	14	11.5	10.5	4.5	2.5	1.5	44.5	0
3	New York	11.5	11.5	8.5	4.5	2.5	0.5	39	2
4	Vermont	11	9	9	4	1	2.5	36.5	-1
5	Maine	10	8.5	8.5	4.5	2.5	1.5	35.5	11
6	District of Columbia	8	11	8.5	3	2.5	2	35	2
7	Rhode Island	12.5	7.5	6	4.5	1.5	1	33	-3
7	Maryland	9.5	10	8	4	0.5	1	33	-1
9	Connecticut	9	10	7	4	2.5	0	32.5	-2
10	Minnesota	12	8	6.5	3	2.5	0	32	-1
11	Oregon	7	10	6	4.5	2	2	31.5	-2
11	Washington	6.5	9.5	7.5	3	2.5	2.5	31.5	0
13	Colorado	9	6.5	8	3	2	2	30.5	-2
14	New Jersey	9.5	7	6.5	3	1	1.5	28.5	3
15	Michigan	13	5	4	2.5	1.5	0	26	-2
16	Illinois	11	6	5	3	-0.5	0	24.5	-1
17	Hawaii	8.5	5	4.5	2	1.5	1.5	23	-3
18	Delaware	4.5	7.5	5	3	1.5	0	21.5	2

Rank	State	Utility and public benefits (15 pts.)	Transportation policies (13 pts.)	Building energy efficiency policies (12 pts.)	State government initiatives (4.5 pts.)	Industrial policies (2.5 pts.)	Appliance efficiency standards (3 pts.)	Total score (50 pts.)	Change in rank from 2020
19	New Hampshire	9	4	3.5	3	0.5	0	20	-1
20	Virginia	3.5	7.5	3.5	3.5	1.5	0	19.5	5
21	Pennsylvania	4.5	5.5	5	3	0.5	0	18.5	-2
21	Nevada	4.5	4.5	4.5	1.5	1.5	2	18.5	0
23	Utah	5.5	4	4	2	1.5	0	17	-1
23	New Mexico	5	3	4.5	3	1.5	0	17	1
25	North Carolina	3	4	4.5	2.5	0.5	0	14.5	2
26	Wisconsin	7.5	1	2.5	1	1	0	13	0
26	Arizona	5.5	5	0.5	2	0	0	13	-3
28	Tennessee	1.5	3.5	2.5	2	1.5	0	11	1
29	Missouri	3	3.5	1.5	1.5	0.5	0	10	4
29	Montana	2.5	1	4.5	1.5	0.5	0	10	0
29	Texas	2	2.5	4.5	2	-1	0	10	0
29	Florida	0.5	5	2.5	2	0	0	10	-2
33	Idaho	4	1	3	1	0.5	0	9.5	-4
34	Indiana	3	1.5	3	1.5	0	0	9	3
35	Iowa	2.5	2.5	2	0.5	0.5	0	8	1
35	Nebraska	0	1.5	5	1	0.5	0	8	6
37	Arkansas	7	0.5	-0.5	1.5	-1	0	7.5	-4

Rank	State	Utility and public benefits (15 pts.)	Transportation policies (13 pts.)	Building energy efficiency policies (12 pts.)	State government initiatives (4.5 pts.)	Industrial policies (2.5 pts.)	Appliance efficiency standards (3 pts.)	Total score (50 pts.)	Change in rank from 2020
38	Kentucky	2.5	3	1	1.5	-1	0	7	-5
39	Georgia	2	2	2	0.5	0	0	6.5	3
39	Alaska	0.5	2	3	1	0	0	6.5	4
41	Oklahoma	3.5	2	-1	1	-0.5	0	5	-4
41	Alabama	0	0.5	3	1.5	0	0	5	3
43	North Dakota	0	2.5	1	1	0	0	4.5	5
44	West Virginia	0	1	2.5	1.5	-1	0	4	4
44	Ohio	0.5	0.5	3	1	-1	0	4	-7
46	Mississippi	1	0.5	0	1.5	0.5	0	3.5	2
46	Louisiana	0	1	0	2.5	0	0	3.5	-1
46	South Dakota	1.5	1	1	0	0	0	3.5	-1
49	South Carolina	1.5	1	0	1.5	-1	0	3	-9
49	Kansas	0.5	1.5	0.5	0.5	0	0	3	-2
51	Wyoming	1	0	0	1	0	0	2	0

How to Interpret Results

Although we provide individual state scores and rankings, the differences among the states are most instructive when considered in tiers of 10. In the middle tiers, relatively few points separate states' total scores: just 8.5 points separate states in the third tier and 3.5 points in the fourth. These middle tiers also have a significant number of ties. For example, in the third tier, Arizona and Wisconsin are tied for 26th while Florida, Texas, Montana and Missouri are tied for 29th. In these middle tiers, small energy efficiency improvements will likely have a significant effect on the state rankings. Conversely, idling states in the middle tiers will fall behind easily as other states in this large group ramp up their efficiency efforts.

The top tier has more variation in scoring, stretching across a 15-point range. California and Massachusetts were the only states scoring 40 or more points this year. Others in the top tier are also well-established high scorers. Generally, the highest-ranking states have all made broad, long-term commitments to energy efficiency and equitable practices, indicated by their staying power at the top of the *State Scorecard* over the past decade. However, it is important to note that retaining one's spot in the lead pack is no easy task; all of these states must embrace new, cutting-edge strategies and programs to remain at the top.

2022 Leading States

California maintained its hold on first place this year—its sixth time in the top spot since the *Scorecard*'s 2007 inception. Massachusetts followed in second, two-and-a-half points behind California. Massachusetts continues to lead on multiple fronts, including in its advanced efforts to integrate efficiency with state electrification and decarbonization strategies, as well as energy efficiency policies to aid industrial decarbonization.

California continues to lead the pack on building energy codes, vehicle emissions, and progress on energy efficiency in the utilities sector. The state has implemented policies to center equity in utility energy efficiency programs and is one of six states that actively provides intervenor compensation to those participating in regulatory proceedings. The California Environmental Protection Agency's CalEnviroScreen 4.0 mapping tool identifies communities that have disproportionate pollution levels and is used to prioritize funding for these communities. On the transportation side, California is the only state that has a reduction goal targeted at freight-related emissions. In August 2022, the Golden State approved the ambitious Advanced Clean Cars II rule, which will deliver huge GHG reductions by significantly growing the ZEV market. The rule, along with other state programs, aims to make ZEVs accessible to the state's low-income consumers and disadvantaged communities. The state is also prioritizing equitable decarbonization of buildings by setting goals for heat pump deployment and climate-resilient homes, and by ensuring that half of the deployment occurs in low-income and toward disadvantaged communities.

Driven by a robust policy framework under its 2008 Green Communities Act, **Massachusetts** continues to deliver comprehensive, equity-focused programs and policies to strengthen efficiency in all sectors included in this report. In August 2022, Governor Charlie Baker signed An Act Driving Clean Energy and Offshore Wind into law. Among the bill's provisions are

advancements in renewable energy generation; energy use reporting requirements for buildings larger than 20,000 square feet; allowing up to 10 municipalities to pilot banning fossil fuel hookups in newly constructed buildings; and ending the sale of internal combustion vehicles after 2035. In recent years, the state has moved to align energy efficiency with emissions reduction goals under its Global Warming Solutions Act. An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy (S.9), requires the state secretary of Energy and Environmental Affairs to set a GHG reduction goal for each subsequent three-year energy efficiency plan. The state has also prioritized investment in measures that encourage electrification, including through electric heat pumps and home energy retrofits. Earlier this year, the Department of Public Utilities approved the 2022–2024 Three-Year Energy Efficiency Plan for the state's utilities. The plan makes a concerted effort to increase investments in a diverse workforce and to better serve environmental justice communities by improving community outreach strategies and offering enhanced efficiency incentives.

New York moved up two places, ranking in the top five for the third year in a row. Earlier this year, New York enacted a law advancing both appliance standards and building codes. The law authorizes the New York State Energy Research and Development Authority (NYSERDA) to adopt water and efficiency standards for a wide range of products. New York Governor Kathy Hochul also signed S9422 (the "utility thermal energy network and jobs act"), which allows utilities to operate thermal energy networks as an alternative to fossil-fuel-based heating systems. The state is also incentivizing decarbonization for multifamily buildings by investing $70 million for heat pumps through the Clean Heat for All Challenge. The state's Climate Action Council hopes to release a final Scoping Plan by the end of this year. Among other strategies, the current draft Scoping Plan includes efforts to enhance transit and smart growth and solutions to increase energy efficiency and low-carbon fuels in the industrial sector.

Vermont can now celebrate its eight-year streak in the *Scorecard* top five. Vermont is among 14 states since 2018 that have established energy- and water-saving standards for 16 products. Cumulatively, these standards are expected to save consumers $210 million by 2035 and help meet the state's GHG emissions reduction goal. In 2022, Vermont became the first state in the country to enact a clean lighting policy that phases out mercury-containing fluorescent tube lights. LED bulbs will replace the tube lights in the market and lead to large reductions in mercury waste, utility bills, and GHG emissions. The Green Mountain State also supports low-income energy efficiency programs with high levels of state and ratepayer funds and has adopted utility policies to advance equitable energy planning.

States rounding out the top 10 are District of Columbia, Maryland, Rhode Island, Connecticut, and Minnesota. Each has established strong policy structures, incentives, and standards to drive savings through utility programs, efficient new construction, and improved sustainability in the transportation sector. The District of Columbia and Rhode Island have focused particularly on advanced equitable energy efficiency policy in the utility and buildings sectors.

Table 4 shows the number of years that states have ranked in the top 5 and top 10 spots since the *State Scorecard's* 2007 inception.

Table 4. Leading State Scorecard rankings, by years at the top

State	Years in top 5	Years in top 10
California	15	15
Massachusetts	14	15
Vermont	13	15
New York	10	15
Oregon	10	14
Connecticut	6	15
Rhode Island	8	14
Washington	1	13
Minnesota	0	14
Maryland	0	11
Maine	1	3
Illinois	0	2
New Jersey	0	2
District of Columbia	0	2
Wisconsin	0	1

Since the first edition of the *State Scorecard,* nine states have occupied the top 5 spots, and 14 states and the District of Columbia have appeared somewhere in the top 10. California is the only state to have earned a spot among the top 5 in all 15 years, followed by Massachusetts (14 years) and Vermont (13 years). New Jersey, Oregon, Wisconsin, and Illinois have all placed in the top 10, but none have yet scored high enough to rank in the top 5.

Most-Improved States

Relative to last year, this year's most-improved state was **Maine**, which shot up 11 spots with a 9-point increase. Also showing improvements were New Jersey, New York, and the District of Columbia. All of these states added points to their scores and moved up in the rankings.

Maine has taken bold steps toward climate leadership, particularly in the buildings sector. The state gained points for using RGGI funding for programs incentivizing energy-efficient fuel switching and for energy savings achieved by adopting state appliance and equipment

efficiency standards. To further promote decarbonized and affordable housing, Maine enacted LD 1656/HP 1227, which requires projects funded by the state's housing authority to be all-electric and include EV charging. The law also applies to new affordable housing. To reach its 2045 net-zero emissions goal, Maine is also investing in increased weatherization and heat pump incentive programs through provisions included in LD 1429/HP 1045, which passed in March of this year. LD 385/HP 269 established the state's goals to weatherize 35,000 homes and businesses and to heat at least 115,000 homes with high-efficiency heat pumps by 2030. Maine also developed a Clean Transportation Roadmap at the end of 2021 to set forth a comprehensive plan for advancing EV adoption with equity as a focus.

New Jersey has spent the past year implementing its new energy efficiency programs, which were finalized in June 2021. The programs are geared toward reaping greater energy savings in support of the state's clean energy goals, while focusing on serving disadvantaged communities. Through a strong stakeholder engagement process, the New Jersey Board of Public Utilities (BPU) continues to utilize its working groups to consider access, affordability, and participation in energy efficiency programming. The Equity Working Group has spent the past several months developing equity-focused metrics for utility companies to use, while the Workforce Development Working Group creates a plan for utilities to engage with and train workers from historically disadvantaged populations. The BPU is also planning to roll out a Whole House Pilot Program which aims to provide low- to moderate-income homes with energy, health, and safety services; it is the first such state program in the nation. Earlier this year, the BPU adopted New Jersey's first benchmarking program for large commercial buildings over 25,000 square feet. At the end of 2021, New Jersey adopted California's Advanced Clean Trucks (ACT) rule, which will require electrification of medium- and heavy-duty vehicles in the state.

The **District of Columbia** ranks fifth this year, maintaining a strong portfolio of energy efficiency policies. The Clean Energy DC Building Code Amendment Act of 2021 was signed into law this year and requires a net-zero-energy building code for all new commercial buildings. The legislation also bans most fossil fuel use for heating in new buildings. The Climate Commitment Act codified the District's GHG reduction goal to achieve carbon neutrality by 2045. The District also incentivizes efficient buildings by requiring minimum energy performance standards for state housing-agency-funded projects. The Affordable Housing Retrofit Accelerator initiative, launched in December 2021, will provide technical and financial aid to help multifamily building owners comply with the BPS enacted in 2018.

States Losing Ground

A whopping 40 states lost points this year due to significant changes in the scoring methodology in several categories. Twenty-three states fell in the rankings due to factors including greater progress by other states and to scoring poorly on equity-related metrics across all policy areas. Given the number of new metrics in the *State Scorecard* and states' varying efforts, movement should be expected.

South Carolina lost 8 points, falling 9 positions to 49th place, the steepest point loss and fall in rankings in 2022. The state was docked points for allowing industrial, manufacturing, and retail commercial customers to opt out of energy efficiency programs. South Carolina has also placed restrictions on using energy efficiency funds to incentivize beneficial electrification through fuel-switching measure, further pushing the state's scores down.

Ohio also fell several positions to 44th place. The Buckeye State had a drastic decline in utility-reported electric savings in 2021 due to a harmful 2019 bill (HB 6) that effectively eliminated the state's EERS and prohibited utility cost recovery for efficiency programs. The state also lost points for allowing large customers to opt out of energy efficiency programs—a provision that HB 6 further expanded.

In general, we see a few trends among states losing ground in this year's *State Scorecard*. First, many of those falling behind are not increasing their energy savings annually and are therefore being outpaced as other states ramp up programs to meet higher savings targets. States losing ground typically have not fully implemented changes to the utility business model that encourage utilities to take full advantage of energy efficiency as a resource, including through decoupling, performance incentives, and energy savings targets. States are also losing out on a significant number of points from the new equity-focused metrics. Bottom-ranked states have not made much progress toward incorporating equity in state government planning and processes through dedicated equity task forces or toward setting energy burden reduction targets; they are also failing to dedicate resources toward healthy, affordable, and decarbonized housing.

As seen in Ohio, opt-out provisions have been approved in many of the states falling behind in the *State Scorecard* rankings. These provisions allow large customers to avoid paying into energy efficiency programs, forcing other customers to subsidize them while limiting the savings that utilities achieve.

Chapter 2. Utility and Public Benefits Programs and Policies

Author: Weston Berg

INTRODUCTION

Utility-sector energy efficiency programs have been a critical driver of statewide energy savings over the past two decades and are now serving an evolving and more closely coordinated role with state climate and clean energy plans. These efficiency programs have helped households, businesses, and industry fund and adopt efficient technologies and behaviors to reduce energy waste and utility bills and to improve comfort, health, and safety. These benefits have been most pronounced in those states and utilities that have invested in energy efficiency as a resource by factoring efficiency as an integral part of utility energy resource planning and decision-making in much the same way as resources such as power plants, wind turbines, and solar panels. In particular, states that have adopted an energy efficiency resource standard, establishing tangible multiyear utility savings goals, have been most successful in delivering the vast majority of utility-sector savings nationwide.

As state climate and clean energy goals expand and evolve, so too do the expectations for energy efficiency programs, as policymakers seek to deploy efficiency in a way that more directly supports statewide goals and grid decarbonization efforts by reducing costs, improving grid performance, and lowering GHG emissions. In doing so, utility reforms in some states are redefining efficiency to account for and pursue its full range of benefits, including time and locational value, multi-fuel savings, and GHG abatement. These reforms are enabling expanded deployment with improved sophistication, including transitioning buildings from fossil fuel heating to energy-efficient electric heat pumps, and pairing efficiency with flexible grid resources, such as smart controls, renewables paired with storage, and advanced demand response. These add to the portfolio of other traditional efficiency programs that utilities continue to offer through financial incentives, such as rebates and loans; technical services, such as audits, retrofits, and training; and behavioral and education measures.

Just as critical is the need to ensure that these investments are deployed in a way that facilitates a just and equitable clean energy future by addressing historical patterns of injustice in energy planning that have left people of color and rural and low-income customers bearing a disproportionate burden of the negative impacts of fossil fuel investment and climate change. While some states have initiated processes to better understand baseline conditions of energy inequity and to advance plans to improve energy representation, participation, and investment among these communities, these efforts are largely in their infancy and still emerging. Without deliberate efforts to make clean energy plans and programs inclusive of marginalized communities, these investments risk exacerbating past imbalances while leaving these customers behind to shoulder the costs of stranded fossil fuel assets.

METHODOLOGY

For a detailed discussion of our methodology for calculating scores for this chapter, including utility energy efficiency spending and savings, please see Appendix B.

SCORING AND RESULTS

This chapter catalogs and scores statewide utility performance and regulatory practices across multiple policy categories to provide a relative assessment of state commitments to energy efficiency, equitable distribution of energy benefits, and efforts to align efficiency programs with state climate goals. The utility scoring metrics are as follows:

- Incremental annual electricity program savings as a percentage of retail sales (5 points)[12]
- Incremental natural gas and unregulated fuels program savings as a percentage of residential and commercial sales (2.5 points)
- Electricity program spending as a percentage of statewide electric utility revenues (unscored)
- Natural gas program spending per residential gas customer (unscored)
- EERS for utilities and statewide program administrators (2 points)
- Utility business models that encourage energy efficiency, including performance incentives and revenue decoupling (2 points)

In addition, as part of our organization-wide Leading with Equity Initiative, we have revised our scoring to expand consideration of equity-driven utility practices. This increased the points achievable from low-income program spending. It also introduced several new metrics designed to strengthen utility planning and programs as they relate to inclusion of marginalized communities:

- Investment in low-income energy efficiency programs (2 points)
- Policies advancing equitable utility-sector efficiency (0.5 points each for adopting the following policies, for a maximum of 1.5 points)[13]

[12] ACEEE defines *incremental annual savings* as new savings from programs implemented in a given year. Incremental annual savings are distinct from cumulative annual savings, which are the savings in a given program year from all the measures implemented under the programs in that year and in prior years that are still saving energy.

[13] As described later in this chapter, this expansion of equity-focused metrics represents an important step in capturing best-practice policies that extend program benefits to historically disadvantaged and underserved communities and households. We will continue to seek opportunities to align *Scorecard* metrics with emerging strategies to move toward an equitable energy system. For example, income-based rate designs that lower the

- Requirements for minimum level of state or utility support of low-income programs
- Special cost-effectiveness screening provisions or exceptions for low-income programs
- Inclusion of health/safety nonenergy benefits within cost-effectiveness tests (**new**)
- Geographic tracking of program participation distribution and health/pollution impacts (**new**)
- Intervenor compensation (**new**)

In this chapter, a state could earn up to 15 points, or 30% of the 50 total points possible in the *State Scorecard*. This is a notable reduction from the sector's point distribution in previous *Scorecards,* which accounted for 20 points (40%). Historically, the utility sector has represented the largest share of achievable points among sectors in the *Scorecard*, informed by studies showing the savings potential of such programs is approximately 40% of the total energy savings potential of all policy areas scored. However, given the increasing urgency of meeting the climate challenge, our new methodology reconsiders point distributions of policy categories according to their potential to specifically deliver both energy savings *and* GHG savings to support state climate pledges. In this *Scorecard,* we increase points devoted to transportation due to the sector's considerable opportunities to reduce both energy and GHG from EVs. We also add a new industry chapter, recognizing state efforts to reduce energy use and emissions in this important sector. Our new approach also reflects an understanding of the evolving role of utility-sector efficiency as the share of electric generation that renewables provide continues to grow. Many states are now prioritizing beneficial electrification and an energy optimization approach that achieves GHG reductions by replacing fossil-fuel-powered end uses with energy-efficient electric technologies. These future low-carbon grid scenarios necessitate a recalibration of the role of utility-sector efficiency programs, which will also evolve in response to the climate-change-driven state policies. Energy efficiency will remain critical to help manage costs and reduce anticipated new electric loads, though the per unit avoided carbon benefits of efficiency may decline.

ACEEE has found that energy efficiency has the potential to cut both U.S. energy use and GHG emissions in half by 2050 by significantly ramping up investment in technologies that are either cost effective now or likely to become cost effective (Nadel and Ungar 2019). Under this scenario, the ACEEE study found that electrification would account for about 35% of the total 2050 emissions reductions estimate, with 72% of these savings anticipated in the transportation sector, 14% in the industrial sector, and 14% in the buildings sector. Because

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energy burden of low-income ratepayers, though not included in our scoring methodology, may be considered along with other policies for future *Scorecards*.

transportation accounts for the greatest potential for GHG savings among policy sectors, we have scaled back the achievable points in the utilities sector to allow more points for transportation policies—though utility-sector efficiency will remain critical for supporting grid integration of renewables, reducing peak demand and system costs, aiding electrification efforts, reducing combustion emissions, and other economic, health, and equity benefits. Nonetheless, the utility sector still accounts for the largest share of achievable *Scorecard* points (30%), followed closely by transportation (26%).

Further, the *State Scorecard* aims to provide an *annual* snapshot of states' actions related to energy efficiency, benchmarking the progress achieved in the most recent program year. As such, our scoring of program savings focuses on annual incremental energy savings (savings from measures installed in a given year) rather than their total annual cumulative energy savings (those achieved from measures installed that year and in prior years). In so doing, we acknowledge that this approach excludes important historical context by omitting annual savings that continue to accrue from efficiency measures installed in prior years. However, a full comparative historical assessment of statewide cumulative savings would involve levels of complexity that are beyond the scope of the *State Scorecard;* such complexity includes identifying the start year for the cumulative series and accurately accounting for the life of energy efficiency measures and the persistence of savings.

Note also that scores apply to the state as a whole, which typically encompasses a multitude of utilities, each with varying levels of energy efficiency commitment and performance. Thus, scores should not be interpreted as representative of specific efforts of any particular utility, but rather as an aggregate statewide assessment. The *Scorecard*'s focus on state policy's role also means that scores generally do not include voluntary goals that utilities have announced. For more information on the energy savings performance of individual utilities, see ACEEE's *2020 Utility Energy Efficiency Scorecard* (Relf et al. 2020). A forthcoming *2023 Utility Scorecard* is also planned for release in early 2023.

Table 5 lists states' overall utility scores. Explanations of each metric follow.

Table 5. Summary of state scores for utility and public benefits programs and policies

						Policies advancing equitable utility-sector efficiency						
State	2021 electricity savings (5 pts.)	2021 natural gas and fuels savings (2.5 pts.)	2020–2025 energy efficiency resource standard (2 pts.)	2022 performance incentives and fixed-cost recovery (2 pts.)	2021 investment in low-income energy efficiency programs (2 pts.)	Requirements for minimum level of state or utility support of low-income programs	Special C/E screening provisions for low-income programs	Inclusion of health/safe-ty NEBs within C/E tests	Tracking distribution of program participation, benefits, and impacts	Intervenor compensation	Equitable utility policies total (1.5 pts.)	2022 total score (15 pts.)
CA	5	2.5	2	2	2	•	•		•	•	1.5	15
MA	4.5	2.5	1.5	2	2	•	•	•	•		1.5	14
MI	4.5	2.5	1.5	1.5	1.5	•	•			•	1.5	13
RI	4	1.5	2	2	2		•	•			1	12.5
MN	3.5	2.5	1.5	2	1	•	•			•	1.5	12
NY	3.5	1.5	2	2	1.5	•	•				1	11.5
IL	4	1	2	1	1.5	•	•			•	1.5	11
VT	3	0.5	2	2	2	•	•	•	•		1.5	11
ME	3	0.5	1.5	1.5	2	•	•	•	•		1.5	10
MD	4.5	0.5	1.5	1	1.5		•				0.5	9.5
NJ	2.5	1	2	2	1		•	•			1	9.5
CO	2	1	2	1.5	1	•	•	•			1.5	9
CT	2	1	1	2	1.5	•	•	•	•		1.5	9
NH	3	0.5	0	2	2	•	•	•			1.5	9
HI	2.5	1	1	2	1.5				•		0.5	8.5
DC	1.5	0.5	1	1.5	2	•	•	•			1.5	8

						Policies advancing equitable utility-sector efficiency						
State	2021 electricity savings (5 pts.)	2021 natural gas and fuels savings (2.5 pts.)	2020–2025 energy efficiency resource standard (2 pts.)	2022 performance incentives and fixed-cost recovery (2 pts.)	2021 investment in low-income energy efficiency programs (2 pts.)	Requirements for minimum level of state or utility support of low-income programs	Special C/E screening provisions for low-income programs	Inclusion of health/safety NEBs within C/E tests	Tracking distribution of program participation, benefits, and impacts	Intervenor compensation	Equitable utility policies total (1.5 pts.)	2022 total score (15 pts.)
WI	1.5	1	1	1	1.5		•	•		•	1.5	7.5
AR	1.5	1.5	1.5	1.5	0.5		•				0.5	7
OR	1.5	1	1.5	1	0.5	•	•	•	•	•	1.5	7
WA	1.5	0.5	1	1	1		•	•	•	•	1.5	6.5
AZ	2.5	0.5	1	1	0		•				0.5	5.5
UT	2.5	1.5	0	1	0		•				0.5	5.5
NM	1.5	0	1	1.5	0	•	•				1	5
DE	1.5	0.5	0	0	1	•	•	•			1.5	4.5
NV	1.5	0	1	0.5	0	•	•	•			1.5	4.5
PA	1.5	0	0.5	0	1.5	•	•				1	4.5
ID	1.5	0	0	0.5	0.5		•	•		•	1.5	4
OK	0.5	0.5	0	1.5	0	•	•				1	3.5
VA	0	0	1	0.5	1	•	•				1	3.5
IN	1	0.5	0	1	0		•				0.5	3
MO	1	0	0	0.5	0.5		•	•			1	3
NC	1.5	0	0	1	0		•				0.5	3
IA	0.5	0	1	0	0.5		•				0.5	2.5

						Policies advancing equitable utility-sector efficiency						
State	2021 electricity savings (5 pts.)	2021 natural gas and fuels savings (2.5 pts.)	2020–2025 energy efficiency resource standard (2 pts.)	2022 performance incentives and fixed-cost recovery (2 pts.)	2021 investment in low-income energy efficiency programs (2 pts.)	Requirements for minimum level of state or utility support of low-income programs	Special C/E screening provisions for low-income programs	Inclusion of health/safe-ty NEBs within C/E tests	Tracking distribution of program participation, benefits, and impacts	Intervenor compensation	Equitable utility policies total (1.5 pts.)	2022 total score (15 pts.)
KY	0	0	0	1.5	0		•		•		1	2.5
MT	1	0	0	0	0.5	•	•				1	2.5
GA	0.5	0	0	1	0		•				0.5	2
TX	0.5	0	0	0.5	0	•	•				1	2
SC	0.5	0	0	0.5	0		•				0.5	1.5
SD	0	0	0	1.5	0						0	1.5
TN	0	0	0	0.5	0.5		•				0.5	1.5
MS	0	0	0	0.5	0		•				0.5	1
WY	0.5	0	0	0.5	0						0	1
AK	0	0	0	0	0.5						0	0.5
FL	0	0	0	0	0		•				0.5	0.5
KS	0	0	0	0	0		•				0.5	0.5
OH	0	0	0	0	0		•				0.5	0.5
AL	0	0	0	0	0						0	0
LA	0	0	0	0	0						0	0
ND	0	0	0	0	0						0	0
NE	0	0	0	0	0						0	0

						Policies advancing equitable utility-sector efficiency						
State	2021 electricity savings (5 pts.)	2021 natural gas and fuels savings (2.5 pts.)	2020–2025 energy efficiency resource standard (2 pts.)	2022 performance incentives and fixed-cost recovery (2 pts.)	2021 investment in low-income energy efficiency programs (2 pts.)	Requirements for minimum level of state or utility support of low-income programs	Special C/E screening provisions for low-income programs	Inclusion of health/safe-ty NEBs within C/E tests	Tracking distribution of program participation, benefits, and impacts	Intervenor compensation	Equitable utility policies total (1.5 pts.)	2022 total score (15 pts.)
WV	0	0	0	0	0						0	0

DISCUSSION

From their low point in 1998, annual investments in electricity programs increased more than fourfold by 2010, from approximately $900 million to $3.9 billion. However, growth in efficiency investments has slowed in recent years. In 2021, total spending for electric efficiency decreased approximately 2.3% to $5.96 billion. As figure 2 shows, when we add natural gas program spending of $1.69 billion, we estimate total efficiency program spending of approximately $7.66 billion in 2021—an increase of approximately 0.82% compared with 2020.

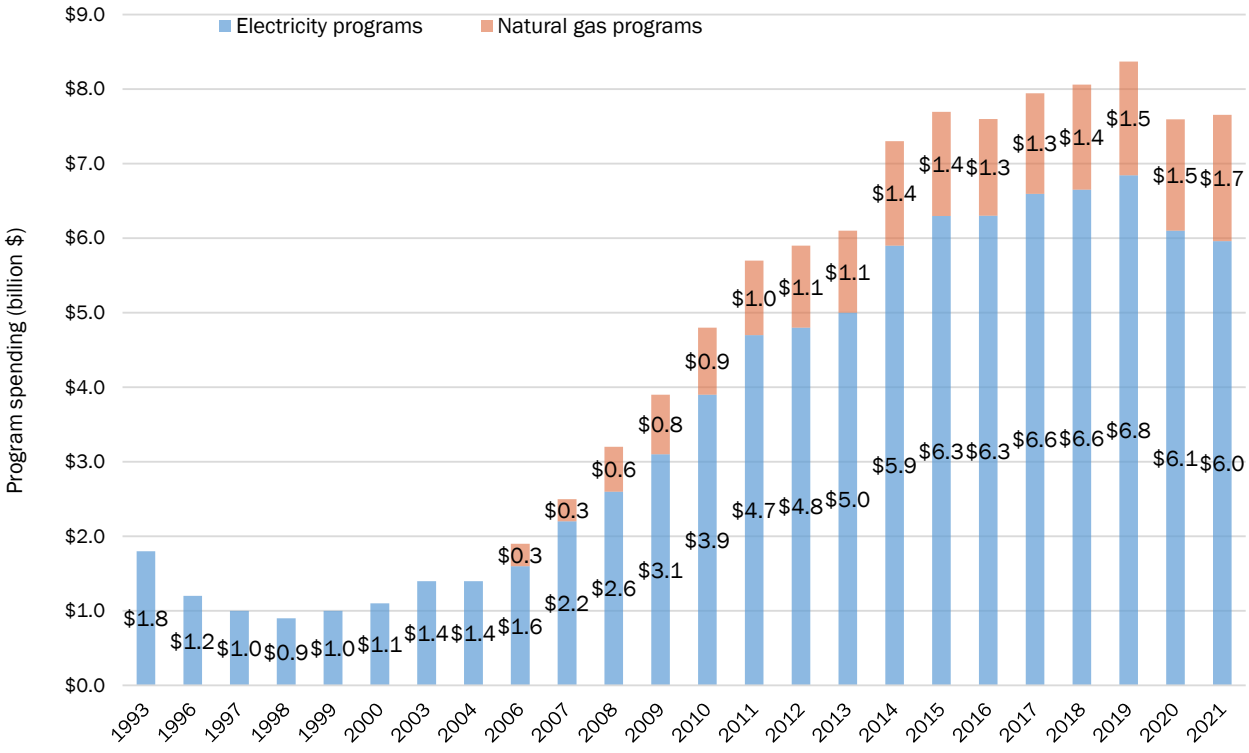

Figure 2. Annual electric and natural gas energy efficiency program spending. Natural gas spending is not available for the years 1993–2004. Sources: Nadel, Kubo, and Geller 2000; York and Kushler 2002, 2005; Eldridge et al. 2007, 2008, 2009; CEE 2012, 2013, 2014, 2015, 2016, 2017, 2018; Gilleo et al. 2015b; Berg et al. 2016, 2017, 2018, 2019, 2020; Berg, Cooper, and DiMascio 2022.

Nationwide reported savings from utility and public benefits electricity programs in 2021 totaled 0.68% of sales, or 26 million MWh, a 2.43% decrease from 2020. However, 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 3

shows, the total impact of ratepayer-funded energy efficiency programs was a savings of more than 290 million MWh in 2021: the 26 million MWh of incremental savings plus savings still accruing from measures implemented in prior years.[14] These large-scale savings are equivalent to approximately 7.63% of 2021 electricity consumption.

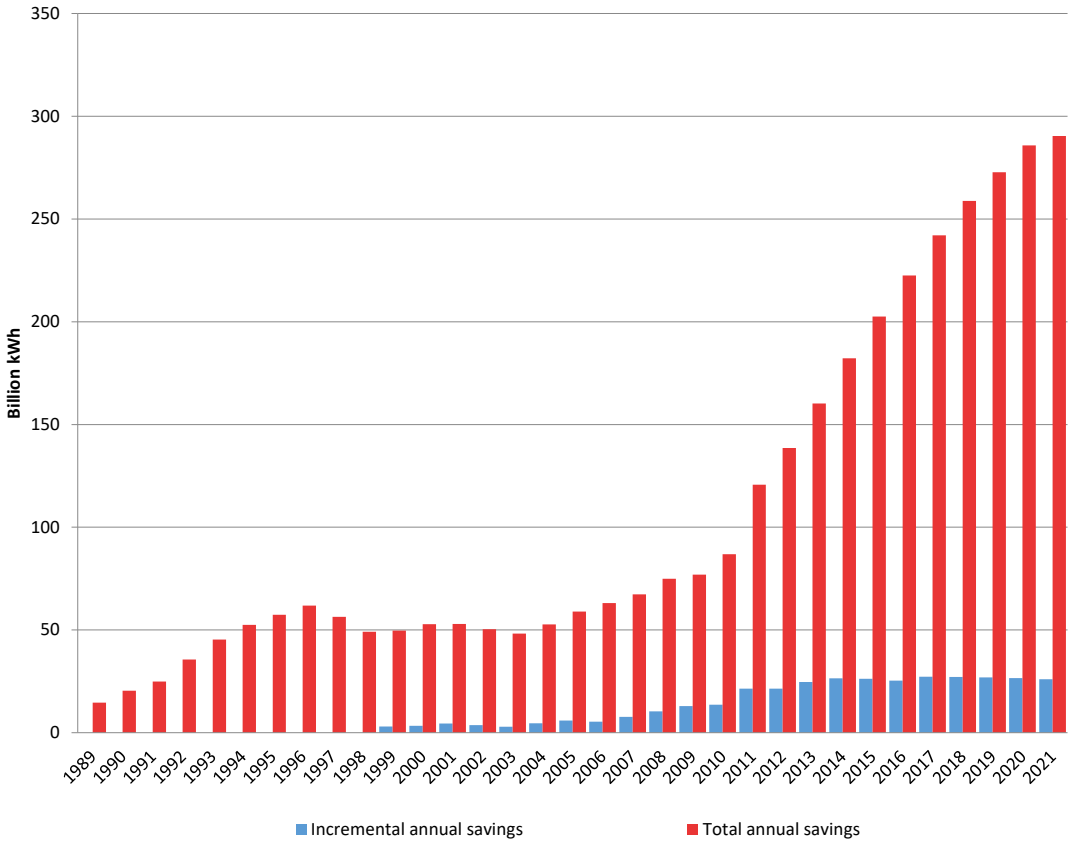

Figure 3. Electric savings from utility-sector energy efficiency programs, by year

While savings declined at a nationwide level, state-level changes in savings varied considerably, with many states—including Illinois, Maine, Michigan, Minnesota, and New Mexico—posting notably higher utility savings, bolstered by strong utility savings targets and recent policies to further strengthen investment in efficiency. In other states, various factors contributed to savings declines. Some utilities cited lingering pandemic-related challenges impacting certain programs. In Ohio, savings levels were effectively wiped out as

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

a direct result of HB 6, energy legislation signed in 2019 that gutted the state's energy efficiency resource standard and altogether eliminated utility programs. Once a Midwest leader in energy efficiency, Ohio dropped to near the bottom of the *Scorecard* rankings this year, a steep decline for a state that had accounted for 5–6% of national-level electric savings in recent years.

In other states, reasons for declining electric savings varied. For example, in Massachusetts and Vermont, both high-ranking leaders in energy efficiency, efforts to decarbonize the electric grid with clean energy investments have triggered a shift in priorities for efficiency programs and a growing emphasis on reducing GHG emissions and maximizing system benefits (rather than simply saving kilowatt hours). This has meant more investment in beneficial electrification measures such as energy-efficient heat pumps and efforts to shift customers away from fossil fuel heating, which can increase electric demand but help states meet climate goals by reducing GHG. As state efforts to advance building decarbonization through electrification continue to gain traction, we expect to see similar evolutions in other utility program portfolios, with a growing emphasis on total fuel savings, avoided GHG, and overall net benefits to society.

Savings from Electricity and Natural Gas Efficiency Programs

We assess 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. Program portfolios may initially concentrate on the most cost-effective and easily accessible measure types, such as energy-efficient lighting and appliances. As utilities gain experience, as technologies mature, and as customers become aware of the benefits of energy efficiency, the number of approaches increases.

In states ramping up funding in response to aggressive EERS policies, programs typically shift focus from widget-based approaches (e.g., installing new, more efficient water heaters) to comprehensive deep-savings strategies that seek to generate greater energy efficiency savings per program participant by conducting whole-building or system retrofits. Some deep-savings approaches also draw on complementary efficiency efforts, such as utility support for full implementation of building energy codes (Nowak et al. 2011; Misuriello et al. 2012; MN Department of Commerce 2021). Deep-savings approaches may also promote grid-interactive efficient buildings (GEBs) and comprehensive changes in systems and operations by including behavioral elements that empower customers.

We should note that while we continue to consider electric and natural gas savings separately in this report, our research has found that a handful of states—particularly those with aggressive clean energy and GHG reduction goals—are now measuring savings on a combined fuel-neutral basis. Such an approach allows states the flexibility to better account for savings from resources with competing 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, particularly in regions with a relatively high penetration of renewable energy resources. This approach to accounting continues to evolve, 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.[15]

Scores for incremental savings in 2021 from electric efficiency programs

We report 2021 statewide net energy efficiency savings as a percentage of 2021 retail electricity sales, scoring the states on a scale of 0 to 5. We relied primarily on states to provide these data; 36 states and the District of Columbia completed some or all of our data request form. Where states provided partial or no data, we used 2021 adjusted gross savings reported by EIA (2022a), which we further adjusted to approximate net savings. (See Appendix B for more details regarding methodology.)

As we have since 2015, we awarded full points to states that achieved savings of at least 2% of electricity sales. We continue to see examples of states exceeding the 2% mark. Table 6 lists the scoring for each savings level.

Table 6. Scoring of electric efficiency programs

2021 savings as % of sales	Score
2% or greater	5
1.80–1.99%	4.5
1.60–1.79%	4
1.40–1.59%	3.5
1.20–1.39%	3
1.00–1.19%	2.5
0.80–0.99%	2
0.60–0.79%	1.5
0.40–0.59%	1
0.20–0.39%	0.5

[15] Among the states currently measuring savings on a total MMBtu basis are Massachusetts, New York, and Connecticut, along with the District of Columbia.

2021 savings as % of sales	Score
Less than 0.20%	0

Table 7 shows state results and scores. Nationwide reported savings from utility and public benefits electricity programs in 2021 totaled 25.97 million MWh, equivalent to 0.68% of 2021 sales. This is approximately 2.43% less than the 26.62 million MWh (0.72% of sales) reported last year.

Table 7. 2021 net incremental electricity savings by state

State	2021 net incremental savings (MWh)	% of 2021 retail sales	Score (5 pts.)	State	2021 net incremental savings (MWh)	% of 2021 retail sales	Score (5 pts.)
California	5,486,900	2.22%	5	Idaho	153,253	0.61%	1.5
Michigan	1,830,456	1.83%	4.5	Missouri†‡	453,525	0.58%	1
Massachusetts	929,058	1.83%	4.5	Montana†‡	82,679	0.55%	1
Maryland	1,080,385	1.82%	4.5	Indiana*†	445,282	0.45%	1
Rhode Island	131,365	1.78%	4	Oklahoma*†	253,008	0.39%	0.5
Illinois	2,291,195	1.69%	4	Iowa†‡	200,324	0.38%	0.5
Minnesota	955,196	1.43%	3.5	South Carolina*†	287,420	0.36%	0.5
New York	1,988,650	1.41%	3.5	Wyoming*†	39,315	0.25%	0.5
Vermont	75,315	1.39%	3	Texas	913,547	0.21%	0.5
Maine	141,416	1.22%	3	Georgia†‡	278,974	0.20%	0.5
New Hampshire	130,377	1.20%	3	South Dakota	23,044	0.18%	0
Hawaii	104,531	1.17%	2.5	Virginia†‡	193,723	0.15%	0
Arizona	871,142	1.07%	2.5	Kentucky†‡	89,754	0.12%	0
New Jersey	764,071	1.05%	2.5	Mississippi†‡	56,655	0.12%	0
Utah	327,402	1.00%	2.5	Louisiana*†	104,169	0.11%	0
Connecticut	273,318	0.99%	2	Nebraska	32,540	0.10%	0
Colorado†‡	520,219	0.92%	2	Florida†‡	192,897	0.08%	0
Arkansas	377,038	0.77%	1.5	Tennessee	13,080	0.01%	0
Washington*†	671,545	0.76%	1.5	Ohio*†	15,903	0.01%	0

State	2021 net incremental savings (MWh)	% of 2021 retail sales	Score (5 pts.)	State	2021 net incremental savings (MWh)	% of 2021 retail sales	Score (5 pts.)
Nevada	286,574	0.73%	1.5	Alabama†‡	7,630	0.01%	0
New Mexico†‡	183,776	0.72%	1.5	West Virginia	2,611	0.01%	0
Oregon*†	384,971	0.71%	1.5	Alaska*†	87	0.00%	0
Delaware	78,268	0.68%	1.5	North Dakota*†	239	0.00%	0
District of Columbia	65,109	0.65%	1.5	Kansas*†	240	0.00%	0
North Carolina	869,372	0.64%	1.5	U.S. total	25,971,443	0.68%	
Wisconsin	431,844	0.62%	1.5	Median	200,324	0.62%	
Pennsylvania†‡	882,055	0.62%	1.5				

Savings data are from public service commission staff unless otherwise noted. Sales data are from EIA Form 861 (2022). *For states where we were unable to obtain savings data from commission staff, we relied on 2021 adjusted gross savings data from EIA-861 (2022). †At least a portion of savings were reported as gross. We adjusted the gross portion by a net-to-gross (NTG) factor of 0.809 to make it comparable with net savings figures reported by other states. We derived this NTG factor based on the median NTG value among those states that reported figures for both net and gross natural gas savings in this year's data request (see Appendix B). ‡Includes both state-reported investor-owned utility data and some portion of EIA-reported savings for municipal utilities and co-ops.

Scores for Incremental Savings in 2021 from Natural Gas and Unregulated Fuels Efficiency Programs

In 2021, utilities increased 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 awarded points to states that tracked savings from their natural gas and unregulated fuels efficiency programs and realized savings of at least 0.20% of sales in the residential and commercial sectors. We relied on data from state utility commissions. Table 8 lists scoring criteria for natural gas and unregulated fuels program savings. We awarded a maximum of 2.5 points to states reporting savings of at least 1.00% of sales.

Table 8. Scoring of natural gas and unregulated fuel program savings

Natural gas and unregulated fuel savings as % of sales	Score
1% or greater	2.5
0.8–0.99%	2
0.6–0.79%	1.5

Natural gas and unregulated fuel savings as % of sales	Score
0.4–0.59%	1
0.2–0.39%	0.5
< 0.2%	0

Table 9 shows states' scores for natural gas and unregulated fuel program savings.[16]

Table 9. State scores for 2021 natural gas and delivered fuel efficiency program savings

State	2021 net incremental natural gas and fuel savings (MMBtu)*	% of 2020 commercial and residential retail sales**	Score (2.5 pts.)	State	2021 net incremental natural gas and fuel savings (MMBtu)*	% of 2020 commercial and residential retail sales**	Score (2.5 pts.)
California	9,864,775	1.22%	2.5	Iowa*	217,332	0.13%	0
Michigan	6,445,756	1.12%	2.5	North Carolina	151,900	0.09%	0
Massachusetts‡	3,650,206	1.08%	2.5	Pennsylvania*	319,053	0.06%	0
Minnesota*	3,270,461	1.07%	2.5	Florida*	63,389	0.06%	0
New York	6,500,000	0.68%	1.5	Montana	28,342	0.04%	0
Rhode Island	314,561	0.68%	1.5	South Dakota*	9,056	0.03%	0
Utah	830,000	0.62%	1.5	Nevada	21,400	0.03%	0
Arkansas	610,000	0.60%	1.5	Alabama	–	0.00%	0
New Jersey*	2,408,764	0.58%	1	Alaska	–	0.00%	0
Connecticut‡	969,774	0.55%	1	Georgia	–	0.00%	0
Oregon*	642,941	0.55%	1	Kansas	–	0.00%	0

[16] 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 0.906 based on states that reported figures for both net and gross natural gas savings in this year's data request. These states were Connecticut, Delaware, District of Columbia, Maryland, Massachusetts, Montana, Oklahoma, Oregon, Pennsylvania, and Wisconsin.

State	2021 net incremental natural gas and fuel savings (MMBtu)*	% of 2020 commercial and residential retail sales**	Score (2.5 pts.)
Wisconsin	1,540,000	0.49%	1
Illinois	3,142,793	0.46%	1
Colorado	1,033,082	0.44%	1
Hawaii	–	0.00%	1
Oklahoma	460,000	0.36%	0.5
New Hampshire‡	275,669	0.36%	0.5
District of Columbia	96,690	0.34%	0.5
Delaware‡	104,206	0.32%	0.5
Vermont‡	158,061	0.31%	0.5
Indiana	675,945	0.26%	0.5
Maryland	468,534	0.25%	0.5
Arizona*	212,804	0.23%	0.5
Washington*	429,771	0.21%	0.5
Maine*	176,860	0.20%	0.5
New Mexico	159,305	0.19%	0
Idaho*	108,666	0.14%	0
Kentucky	–	0.00%	0
Louisiana	–	0.00%	0
Mississippi	–	0.00%	0
Missouri	–	0.00%	0
Nebraska	–	0.00%	0
North Dakota	–	0.00%	0
Ohio	–	0.00%	0
South Carolina	–	0.00%	0
Tennessee	–	0.00%	0
Texas	–	0.00%	0
Virginia	–	0.00%	0
West Virginia	–	0.00%	0
Wyoming	–	0.00%	0
U.S. total	45,360,096	0.45%	
Median	151,900	0.14%	

Savings data were reported by contacts at public utility commissions, unless otherwise noted. **All sales data are from EIA (2021a) and EIA's State Energy Data System (SEDS) (EIA 2021b). *At least a portion of natural gas savings were reported as gross; we adjusted the gross portion by a net-to-gross (NTG) factor of 0.906 to make it comparable with net savings figures reported by other states. We derived this NTG factor based on the median NTG value among those states that reported figures for both net and gross natural gas savings in this year's data request (see Appendix B). ‡These states reported some level of unregulated fuel savings.

ELECTRICITY AND NATURAL GAS EFFICIENCY PROGRAM FUNDING

In a departure from our methodology in previous *Scorecards*, ACEEE has retired our scoring categories related to utility spending on energy efficiency programs. This revision is in response to reader comments regarding our past *Scorecard* methodology; readers noted that total spending is not an actual assessment of program effectiveness, which is already better captured in our savings-based program metric. But, for purposes of tracking and

continuity, we continue to maintain this data collection for researchers and advocates (see the figures below).

Program expenditures tracked in the table below primarily derive from charges included on utility customers' bills, though in some cases revenues from the RGGI are included when utilities administered them.[17] Appendix B offers additional details about our methodology. Tables 10 and 11 report electricity and natural gas efficiency program spending, respectively.

Table 10. 2021 electric efficiency program spending by state

State	2021 elec. spending ($ million)	% of 2021 statewide elec. revenues	State	2021 elec. spending ($ million)	% of 2021 statewide elec. revenues
Vermont†[1]	64.6	7.3%	Montana**	16.1	1.1%
Rhode Island†	94.6	6.9%	Iowa**	47.5	1.0%
Massachusetts†	661.3	6.8%	Wisconsin	64.6	0.8%
Maine†[2]	64.4	4.0%	North Carolina	105.9	0.8%
Connecticut†[3]	194.8	3.8%	Indiana*	84.1	0.8%
Maryland	250.8	3.7%	South Carolina*	60.8	0.8%
New Hampshire†	63.7	3.4%	Pennsylvania	108.0	0.8%
Illinois	408.7	3.0%	Wyoming**	9.1	0.7%
Oregon	142.7	2.9%	Virginia	68.2	0.6%
Michigan	371.0	2.9%	Texas	180.2	0.5%
Washington**	203.6	2.6%	Louisiana*	32.0	0.4%
New York†[4]	595.7	2.6%	Florida**	99.0	0.4%
Minnesota	173.9	2.4%	Mississippi*	16.3	0.4%
Idaho	42.1	2.0%	South Dakota	3.8	0.3%
New Mexico**	49.3	2.0%	Georgia**	39.9	0.3%
Utah	53.5	2.0%	Nebraska	6.6	0.2%
New Jersey	197.0	1.9%	Tennessee	21.9	0.2%
Delaware†	23.0	1.9%	Kentucky*	8.3	0.1%

[17] 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.

State	2021 elec. spending ($ million)	% of 2021 statewide elec. revenues
Hawaii	49.8	1.8%
Colorado**	107.4	1.7%
Arkansas	75.3	1.7%
California	744.9	1.5%
Missouri**	106.3	1.4%
Nevada	45.7	1.4%
Arizona	108.1	1.2%
District of Columbia	15.2	1.2%
Oklahoma*	64.2	1.2%
West Virginia**	3.4	0.1%
Alabama*	6.0	0.1%
Ohio*	7.6	0.1%
North Dakota*	0.2	0.0%
Kansas*	0.3	0.0%
Alaska*	0.0	0.0%
U.S. total	5961.2	1.41%
Median	64.2	1.18%

2021 statewide revenues are from EIA Form 861 (EIA 2022c). *Where 2021 spending was not directly available from states, we used 2021 spending as reported by EIA-861 (EIA 2022c). **Includes both state-reported investor-owned utility data and some portion of EIA-reported spending for municipal utilities and co-ops. †Includes some spending on unregulated fuel efficiency programs. [1]Includes $17.1 million toward other thermal fuel savings. [2]Includes $13.9 million toward heating oil, kerosene, propane, and wood. [3]Includes $32.7 million toward propane/heating oil savings. [4]Includes $37.4 million toward other unregulated fuel savings.

After a significant uptick in 2014, natural gas program spending levels have remained relatively flat in recent years. In 2021, spending totaled $1.7 billion, up from $1.5 billion in 2020. Natural gas efficiency spending remains significantly lower than spending for electricity energy efficiency programs.

Table 11. 2021 natural gas efficiency program spending by state

State	2021 gas spending ($ million)	$ per 2021 residential customer
Massachusetts	330.1	$208.67
Rhode Island	35.7	$144.32
Connecticut	56.0	$95.92
New Hampshire	10.2	$89.81
Vermont	4.0	$82.94
New Jersey	159.0	$54.75
Minnesota	70.5	$43.98
Oregon	34.4	$43.65
Delaware	7.7	$40.34
New York	179.0	$39.25
Michigan	127.1	$37.62
Montana	1.8	$6.26
Pennsylvania	13.0	$4.55
Arizona	4.2	$3.16
Missouri	3.4	$2.38
North Carolina	2.0	$1.46
Nevada	1.0	$1.08
South Dakota	0.1	$0.70
Alabama	–	–
Alaska	–	–
Georgia	–	–
Hawaii	–	–

State	2021 gas spending ($ million)	$ per 2021 residential customer
Florida	27.3	$32.49
California	361.9	$32.22
Arkansas	14.9	$26.23
Washington	32.3	$25.78
District of Columbia	3.8	$24.54
Utah	25.0	$24.29
Illinois	83.2	$20.93
Oklahoma	17.1	$17.67
Maine	0.6	$15.55
Idaho	6.5	$14.72
Colorado	24.8	$13.27
New Mexico	6.8	$11.10
Iowa	9.8	$10.30
Maryland	11.0	$9.28
Wisconsin	16.1	$8.83
Indiana	14.5	$7.98
Kansas	–	–
Kentucky	–	–
Louisiana	–	–
Mississippi	–	–
Nebraska	–	–
North Dakota	–	–
Ohio	–	–
South Carolina	–	–
Tennessee	–	–
Texas	–	–
Virginia	–	–
West Virginia	–	–
Wyoming	–	–
U.S. total	1694.8	
Median	4.2	

Spending data provided by public service commission staff. Natural gas residential customer data from EIA 2022d.

Energy Efficiency Resource Standards

Energy efficiency targets for utilities, often called 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 (Berg et al. 2020). Twenty-six states and the District of Columbia have EERS policies establishing specific energy savings targets that utilities and program administrators must meet through customer energy efficiency programs. In recent years, the list of EERS states has added Virginia, which established an EERS in the 2020 Virginia Clean Economy Act, and New Jersey, which adopted an EERS under A-3723 (signed in 2018). Despite these additions, however, the net number of EERS states has remained consistent due to policy decisions in Ohio and New Hampshire that have weakened or eliminated energy efficiency programs in those states. These include Ohio's HB 6, which effectively ended the state's energy savings

goals, and actions by the New Hampshire Public Utilities Commission in 2021 that significantly undermined programs.

EERS policies set multiyear targets for electricity or natural gas savings, such as 1% or 2% incremental savings per year or 5% cumulative savings by 2025, which Virginia adopted for Dominion Energy.[18] Although the savings target differs from state to state, each is intended to establish a sustainable, long-term role for energy efficiency in the state's overall energy portfolio. ACEEE considers a state to have an EERS if it has a policy in place that meets three criteria:

- Sets clear, long-term (3+ years) targets for utility-sector energy savings
- Makes targets mandatory
- Includes sufficient funding for full implementation of programs necessary to meet targets

Several states mandate all cost-effective efficiency, requiring utilities and program administrators to determine and invest in the maximum amount of cost-effective efficiency feasible.[19] ACEEE considers states with such requirements to have EERS policies in place once the policies have met the three criteria listed above.

EERS policies aim explicitly for quantifiable energy savings, reinforcing the idea that energy efficiency is a utility system resource on par with supply-side resources. These standards help utility system planners more clearly anticipate and project the impact of energy efficiency programs on utility system loads and resource needs. Energy savings targets are generally set at levels that push efficiency program administrators to achieve higher savings than they otherwise would, with goals typically based on analysis of the energy efficiency savings potential in the state to ensure that the targets are realistic and achievable. EERS policies maintain strict requirements for cost-effectiveness so that efficiency programs are guaranteed to provide overall benefits to customers. These standards help to ensure a long-term commitment to energy efficiency as a resource, building both essential customer

[18] *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 targets without reference to sales in previous years, or as a percentage of load growth.

[19] The seven states that require all cost-effective efficiency 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.

engagement and the workforce and market infrastructure needed to sustain the high savings levels.[20]

States are increasingly seeking strategies to meet GHG reduction goals, such as through grid decarbonization and the electrification of buildings and vehicles. These efforts create opportunities to adapt EERS policies to encourage resource-specific savings, while also promoting technologies that may increase grid demand but that also result in net reductions in emissions and net societal benefits. Redesigning goals and establishing new targets—such as establishing fuel-neutral goals and peak demand targets—can help meet multiple policy objectives in these cases. Such efforts remove prohibitions on fuel switching to provide more flexibility and enable energy efficiency from beneficial electrification. In addition, more innovative and GHG-oriented energy efficiency measures could become available for EERS if states adopt more holistic cost-effectiveness screens that align with the climate goals of respective utility regulatory jurisdictions, as recommended in the National Standard Practice Manual (NSPM) for Distributed Energy Resources.

Scores for Energy Efficiency Resource Standards

A state could earn up to 2 points for its EERS policy. As table 12 shows, we scored states according to their electricity savings targets. States could earn an additional 0.5 points if natural gas was included in their savings goals.

This year, we also added an alternative pathway to earn an additional 0.5 points if a state reoriented its EERS policy framework around a fuel-neutral GHG goal. This is intended to recognize states that have taken steps to redesign their utility energy efficiency programs in order to prioritize investments that optimize climate benefits. While these reform efforts currently are taking place in just a handful of states—including Massachusetts—those that have moved to this framework show a notable shift toward prioritizing efficiency investments in measures that reduce fossil fuel home heating, such as transitions to electric heat pumps and home energy retrofits. It is important to note that this increasing dependence on electrification as a decarbonization strategy has also coincided with a leveling off or lowering of electric savings targets in certain states, particularly those with grids comprising higher levels of low-carbon renewables, historically strong energy efficiency programs, and more mature energy efficiency markets. In terms of comparing state EERS targets in the future, this electrification trend poses a challenge for the *Scorecard* and its

[20] The ACEEE report *Next-Generation Energy Efficiency Standards* analyzed current trends in EERS implementation and found that utilities in 20 out of the 25 states examined met or exceeded their savings targets in 2017 (Gold, Gilleo, and Berg 2019).

scoring methodology for two key reasons: (1) It points to what is likely a growing bifurcation between states transitioning to a combined fuel-neutral MMBtu/GHG EERS and those maintaining a fuel-siloed EERS structure with separate electricity and natural gas targets. (2) Comparing electric savings target levels alone tells an incomplete story of a state's efforts to reduce GHG-emitting fossil fuels, especially in states where policymakers are aligning efficiency and climate policies in ways that seek to optimize electric use of a low-carbon grid. So, while we retain a comparison of electric savings targets in this *Scorecard*, as more states move to a total fuels metric measured in MMBtus and/or avoided GHGs, we may redesign this scoring category.

Some EERS policies contain cost caps that limit spending, thereby reducing the policy's effectiveness. This year, we did not subtract points for the existence of a cost cap, although we do note whether a cost cap is in place in the results below (table 13). Most of the states with a cost cap have found themselves constrained. As a result, regulators have approved lower energy savings targets. In these cases, we score states on the lower savings targets approved by regulators that account for the cost cap, rather than on the higher legislative targets.

Table 12. Scoring of energy savings targets

Electricity savings target	Score
2% or greater	2
1.5–1.99%	1.5
1–1.49%	1
0.5–0.99%	0.5
Less than 0.5%	0

Additional consideration	Score (maximum 0.5 pts.)
EERS includes natural gas	+0.5
Has established fuel-neutral GHG goals to be achieved from EE programs	+0.5

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 period.

States with pending targets had to be on a clear path to establishing a binding mechanism to earn points in this category. Examples of a clear path include draft decisions by commissions awaiting approval within six months and agreements on targets among major stakeholders.

Leadership, sustainable funding sources, and institutional support are required for states to achieve their long-term energy savings targets. Several states currently have (or previously have had) EERS-like structures in place, but they lacked one or more of these enabling elements and thus undercut the achievement of their savings goals. Florida, for example, sets relatively low voluntary goals and does not earn points in this category.[21] Most states with EERS policies or other energy savings targets have met their goals and are on track to meet future goals (Gold et al. 2019).

Some states fall short of their EERS targets in a given year. In this and previous *Scorecards*, we have scored these states on the basis of their policies, not on current performance, because they are losing points in other metrics (such as spending and savings). However, we may change our scoring methodology in the future to reduce points allocated to states that miss their savings targets.

EERS policies can vary widely in the portion of statewide sales that they regulate. In several states, including Colorado and New Mexico, an EERS may apply only to investor-owned utilities, meaning that smaller municipal utilities and electric cooperatives are exempt from meeting savings targets. While our scoring does not account for this variation in EERS coverage, we may revise our methodology to do so in the future. Table 13 lists scores.

Table 13. State energy efficiency resource standards

State	% of electricity sales covered by EERS policy	Approximate average annual electric savings target for 2020–2025	Fuel-neutral/ GHG goals established for EE programs	Natural gas savings target	Cost cap	Score (2 pts.)
New York	100%	2.0%	•	•		2
Rhode Island	99%	1.9%		•		2
Illinois	89%	1.8%		•	•	2
Colorado	56%	1.7%		•		2
Vermont	98%	1.6%	•	•		2
New Jersey	100%	1.6%		•		2

[21] In 2014, Florida utilities proposed reducing electric efficiency efforts from 2010 levels by at least 80%. The Florida Public Service Commission approved this proposal.

State	% of electricity sales covered by EERS policy	Approximate average annual electric savings target for 2020–2025	Fuel-neutral/ GHG goals established for EE programs	Natural gas savings target	Cost cap	Score (2 pts.)
California	73%	1.5%	•	•		2
Maryland	97%	1.7%				1.5
Minnesota	97%	1.3%		•		1.5
Oregon	61%	1.3%		•		1.5
Arkansas	50%	1.2%		•		1.5
Massachusetts	85%	1.1%	•	•		1.5
Maine	100%	1.0%		•		1.5
Michigan	100%	1.0%		•		1.5
Hawaii	100%	1.4%				1
Virginia	87%	1.2%				1
Nevada	88%	1.1%				1
Arizona	56%	1.1%				1
New Mexico	69%	1.0%				1
Iowa	75%	0.9%		•	•	1
Washington	83%	0.9%		•		1
Connecticut	93%	0.7%		•		1
Wisconsin	100%	0.7%	•	•	•	1
District of Columbia	100%	Combined fuel-neutral goal only[1]	•			1
Pennsylvania	96%	0.6%			•	0.5
North Carolina	100%	Combined EERS/RPS				0
Texas	74%	0.2%			•	0

***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. [1]District of Columbia was awarded 0.5 points commensurate with 0.65% net electricity savings achieved in 2021.**

Utility Business Model and Energy Efficiency: Earning a Return and Fixed-Cost Recovery

Under traditional regulatory structures, utilities lack an economic incentive to promote energy efficiency. Indeed, they typically have a disincentive because falling energy sales from energy efficiency programs reduce utilities' revenues and profits—an effect referred to as *lost revenues* or *lost sales*. Because utilities' earnings are usually based on the total capital invested in certain asset categories—such as transmission and distribution infrastructure and power plants—and the amount of electricity sold, the financial incentives are very much tilted in favor of increased electricity sales and expanding supply-side systems.

This dynamic has led industry experts to devise ways of addressing the possible loss of earnings and profit from customer energy efficiency programs, thereby removing utilities' financial disincentive to promote energy efficiency. Three key policy approaches properly align utility incentives and remove barriers to energy efficiency. The first is to ensure that utilities can recover the direct costs associated with implementing energy efficiency programs. This is a minimum threshold requirement for utilities and related organizations to fund and offer efficiency programs; every state meets it in some form. Given the wide acceptance of program cost recovery, we do not address it in the *State Scorecard*.

The two other mechanisms are fixed-cost recovery (which comes in two general forms: full revenue decoupling and lost revenue adjustment mechanisms) and performance incentives. Revenue decoupling—the dissociation of a utility's revenues from its sales—aims to make the utility indifferent to decreases or increases in sales, removing the *throughput incentive*. Although decoupling does not necessarily make the utility more likely to promote efficiency programs, it removes or reduces the disincentive for it to do so.[22] Additional mechanisms for addressing lost revenues include modifications to customers' rates that permit utilities to collect these revenues, through either a lost-revenue adjustment mechanism (LRAM) or another ratemaking approach. LRAM allows the utility to recover lost revenues from savings resulting from energy efficiency programs while simultaneously increasing sales overall. LRAM does not eliminate the throughput incentive. ACEEE prefers the decoupling approach

[22] Straight fixed variable (SFV) rate design is sometimes considered a simple form of decoupling that collects all costs regarded as fixed in a fixed monthly charge and collects all variable costs in volumetric rates. However, SFV collects the same monthly charge (and fixed costs) for all customers within a class, regardless of customer size. ACEEE discourages the use of SFV as it is not cost based and sends poor price signals to customers to conserve electricity, that is, any consumer actions taken to reduce energy consumption will provide fewer dollar savings. For this reason, the *Scorecard* does not recognize SFV in its scoring methodology in this section.

for addressing the throughput incentive and considers LRAM appropriate only as a short-term solution.

Performance incentives are financial incentives that reward utilities (and in some cases, nonutility program administrators) for reaching or exceeding specified program goals. These may be based on achievement of energy savings targets or based on spending goals. Of the two, ACEEE recommends incentives based on achievement of energy savings targets. As table 15 shows, a number of states have enacted mechanisms that align utility incentives with energy efficiency.[23] While not captured in the table, in a handful of states regulators have approved performance incentive mechanisms (PIMs) in recent years that now encourage a greater variety of "climate-forward" efficiency resources, such as demand response and flexibility, electrification, and deep retrofits. While New York, Vermont, and the District of Columbia have implemented explicit GHG reduction PIMs, most are much more likely to use an energy savings or programmatic proxy metric for GHG reductions, such as by valuing savings in Btus to enable fuel switching, or in peak demand savings to encourage demand response (Gold, Wilson, and Berg 2022).

Scores for Utility Business Model and Energy Efficiency

A state could earn up to 2 points in this category: up to 1 point for implementing PIMs and up to 1 point for implementing full revenue decoupling for its electric and natural gas utilities. We give only partial credit to LRAM policies for the reason discussed above. Table 14 describes our scoring methodology. Information about individual state decoupling policies and financial incentive mechanisms is available in ACEEE's State and Local Policy Database (ACEEE 2022b).

Table 14. Scoring of energy savings targets

Decoupling	Score
Decoupling is in place for at least one major utility for both electric and natural gas.	1
Decoupling is in place for at least one major utility, either electric or natural gas. There is an LRAM or ratemaking approach for recovery of lost revenues for at least one major utility for both electric and natural gas.	0.5
No decoupling policy has been implemented, although the legislature or	0

[23] For a detailed analysis of performance incentives, see Nowak et al. (2015). For a detailed analysis of LRAM, see Gilleo et al. (2015a).

commission may have authorized one. An LRAM or ratemaking approach for recovery of lost revenues has been established for a major utility for either electric or natural gas.

Performance incentives	Score
Performance incentives have been established for a major utility (or statewide independent administrator) for both electric and natural gas.	1
Performance incentives have been established for a major utility (or statewide independent administrator) for either electric or natural gas.	0.5
No incentive mechanism has been implemented, although the legislature or commission may have authorized or recommended one.	0

This year, 28 states offer a performance incentive for at least one major electric utility, and 16 states have incentives for natural gas energy efficiency programs. Some states with third-party program administrators have performance incentives for the administrator rather than for the utilities. Thirty-one states have addressed disincentives for investment in energy efficiency for electric utilities. Of these, 14 have a lost revenue adjustment mechanism and 18 have implemented decoupling, with the most recent addition to the latter being New Mexico. For natural gas utilities, 7 states have implemented an LRAM and 27 have a decoupling mechanism. Table 15 outlines these policies.

It should be noted that in recent years, as states have taken steps to strengthen GHG and clean energy commitments, utilities and policymakers are recognizing the need to realign investments and customer offerings to more directly addresses decarbonization goals. While energy efficiency PIMs traditionally have relied on structures measuring fuel-specific or sector-level savings (in kWh or therms) or measuring net benefits or rates of return on program spending, policymakers have begun to rethink these designs with climate in mind. RMI and ACEEE research has found that PIMs that explicitly or implicitly reward GHG reductions from energy efficiency, demand flexibility, and building and vehicle electrification—that is, *climate-forward efficiency PIMs*—are still in their infancy but have begun to emerge in several states (Gold, Wilson, and Berg 2022). To recognize such efforts, we introduced a new climate-forward PIMs category identifying states that have established an explicit GHG reduction PIM and/or implicit GHG PIM measured on a fuel-neutral basis. Although this category is unscored for now, we may adjust this metric in the future to reward states adopting climate-forward PIMs.

Table 15. Utility efforts to address lost revenues and financial incentives

	Decoupling or LRAM			Performance incentives				
State	Electric	Natural gas	Score (1 pt.)	Electric	Natural gas	Climate-forward PIMs (GHG/fuel-neutral)	Score (1 pt.)	Total score (2 pts.)
California	Yes	Yes	1	Yes	Yes	—	1	2
Connecticut	Yes	Yes	1	Yes	Yes	—	1	2
Hawaii[a]	Yes	—	1	Yes	—	—	1	2
Massachusetts	Yes	Yes	1	Yes	Yes	—	1	2
Minnesota	Yes	Yes	1	Yes	Yes	—	1	2
New Hampshire	Yes*	Yes*	1	Yes	Yes	—	1	2
New Jersey[d]	Yes[c]	Yes	1	Yes	Yes	—	1	2
New York	Yes	Yes	1	Yes	Yes	GHG	1	2
Rhode Island	Yes	Yes	1	Yes	Yes	—	1	2
Vermont	Yes	Yes	1	Yes	Yes	GHG/Fuel-Neutral	1	2
Arkansas	Yes†	Yes†	0.5	Yes	Yes	—	1	1.5
Colorado	Yes	Yes†	0.5	Yes	Yes	—	1	1.5
District of Columbia	Yes	No	0.5	Yes	Yes	GHG/Fuel-Neutral [b]	1	1.5
Kentucky	Yes†	Yes†	0.5	Yes	Yes	—	1	1.5
Maine[c]	Yes	No	0.5	—	—	—	1	1.5
Michigan	No	Yes	0.5	Yes	Yes	—	1	1.5
New Mexico	Yes	Yes	1	Yes	No	—	0.5	1.5
Oklahoma	Yes†	Yes	0.5	Yes	Yes	—	1	1.5
South Dakota	Yes†	Yes†	0.5	Yes	Yes	—	1	1.5
Arizona	Yes†	Yes*	0.5	Yes	No	—	0.5	1
Georgia	No	Yes	0.5	Yes	No	—	0.5	1
Illinois	No	Yes	0.5	Yes	No	—	0.5	1
Indiana	Yes†	Yes	0.5	Yes	No	—	0.5	1
Maryland	Yes	Yes	1	No	No	—	0	1
North Carolina	Yes†	Yes	0.5	Yes	No	—	0.5	1
Ohio	No	No	0	No	No	—	0	0

	Decoupling or LRAM			Performance incentives				
State	Electric	Natural gas	Score (1 pt.)	Electric	Natural gas	Climate-forward PIMs (GHG/fuel-neutral)	Score (1 pt.)	Total score (2 pts.)
Oregon	Yes	Yes	1	No	No	—	0	1
Utah	No	Yes	0.5	Yes	No	—	0.5	1
Washington	Yes	Yes	1	No	No	—	0	1
Wisconsin	No	No	0	Yes	Yes	—	1	1
Idaho	Yes	No	0.5	No	No	—	0	0.5
Mississippi	Yes†	Yes†	0.5	No	No	—	0	0.5
Missouri	Yes†	No	0	Yes	No	—	0.5	0.5
Nevada	Yes†	Yes	0.5	No	No	—	0	0.5
South Carolina	Yes†	No	0	Yes	No	—	0.5	0.5
Tennessee	No	Yes	0.5	No	No	—	0	0.5
Texas	No	No	0	Yes	No	—	0.5	0.5
Virginia	No	Yes	0.5	No	No	—	0	0.5
Wyoming	No	Yes	0.5	No	No	—	0	0.5
Alabama	No	No	0	No	No	—	0	0
Alaska [c]	No	No	0	—	—	—	0	0
Delaware [c]	No	No	0	—	—	—	0	0
Florida	No	No	0	No	No	—	0	0
Iowa	No	No	0	No	No	—	0	0
Kansas	Yes†	No	0	No	No	—	0	0
Louisiana	Yes†	No	0	No	No	—	0	0
Montana	No[e]	No	0	No	No	—	0	0
Nebraska	No	No	0	No	No	—	0	0
North Dakota	No	No	0	No	No	—	0	0
Pennsylvania	No	No	0	No	No	—	0	0
West Virginia	No	No	0	No	No	—	0	0

***Both decoupling and lost revenue adjustment mechanisms are in place. †No decoupling, but lost revenue adjustment mechanism in place. A yes with neither asterisk nor dagger indicates that only decoupling is in place. [a]Hawaii received full points for both gas and electric because it uses minimal amounts of natural gas. [b]For the FY2022–2026 the D.C. Sustainable Energy Utility (DCSEU) contract period performance incentives have been established on a fuel-neutral total MMBtu basis for energy consumption. [c]For state-administered energy efficiency program models without PIMs, we awarded a full 1 point for those that achieved savings in the upper quartile. [d]New Jersey allows for LRAM or limited**

decoupling, through a Conservation Incentive Program, a weather-normalized, symmetrical decoupling mechanism that includes a variable margin test and a supply capacity cost reduction test (as approved for PSE&G). [e]Montana Public Service Commission approved the Fixed Cost Recovery Mechanism (FCRM) in its final order of NorthWestern's 2018 general rate case. However, the FCRM was never implemented after a series of one-year delays requested by the utility.

Centering Equity in Utility Energy Efficiency Programs

Designing clean energy policies and programs so that investment and resulting benefits are inclusive of all customers is critical for bringing about a clean energy transition that is also equitable and just. While policies setting minimum program spending requirements for low-income customer segments have been in place for years, there is growing recognition that these provisions are woefully inadequate to address the legacy of structural imbalances that continue to leave low-income communities and communities of color with statistically higher energy burdens, living in older, energy-inefficient homes, and suffering from health issues exacerbated by these economic challenges and unsafe living conditions.

This section tracks and highlights several state policies and actions to strengthen program participation among historically underserved communities and to ensure accountability in equitable distribution of benefits. As we describe below, we selected several equity metrics to highlight utility regulatory actions that improve program inclusion across three dimensions of equity: procedural, distributional, and structural. These metrics include (1) maintaining investment targets for low-income energy efficiency programs (distributional equity); (2) inclusion of low-income, health, and safety benefits within program cost-effectiveness testing (distributional equity); (3) transparent tracking and reporting of equity-focused program data (structural equity); and (4) offering intervenor compensation for communities that want to participate in utility planning proceedings (procedural equity). This methodology expansion is an important step in centering equity; however, we acknowledge that there is more to be done to align the *State Scorecard* with leading state efforts to reach and strengthen program participation among historically under-resourced communities.

Utility investment in low-income energy efficiency programs. States can use various policy mechanisms to ensure that levels of investment in or savings from income-qualified energy efficiency programs meet a minimum threshold. In Pennsylvania, the PUC incorporated a savings target specific to low-income programs within the state's EERS. It requires each utility to obtain a minimum of 5.5% of its total consumption reduction target from the low-income sector. In most other cases, however, low-income program requirements take the form of a legislative spending set-aside, either by creating a separate fund that receives a minimum annual contribution from ratepayers or by requiring that utilities spend a minimum amount or percentage of their revenues on low-income programs. In recent years, several states have moved to increase these low-income set-asides. Examples include the following:

- **Minnesota**: The Energy Conservation and Optimization Act (2021) triples the amount of electric investor-owned utilities that must be dedicated to low-income customers,

from 0.2% of residential gross operating revenues to 0.6% in 2024. The legislation also increases low-income spending for gas investor-owned utilities and allows 15% of a utility's low-income spending requirement to be met through pre-weatherization measures.

- **Illinois**: The Clean and Equitable Jobs Act (2021) also strengthens low-income energy efficiency requirements, raising minimum spending levels for both Ameren (from $8.34 million to $13 million) and ComEd (from $25 million to $40 million). The legislation further requires minimum investment in pre-weatherization measures (at least 15% of total low-income weatherization budget) and proportional spending for single-family and multifamily customers relative to the magnitude of energy savings potential.

Appendix C describes state rules and regulations establishing minimum levels of investment in low-income energy efficiency.

Inclusion of low-income, health, and safety benefits within program cost-effectiveness testing. Although efficiency delivers multiple benefits beyond just energy savings to utilities, program participants, and society, these benefits are often excluded or undervalued in utility program cost–benefit tests. And, given that low-income households often use less energy than other customers, a narrowly designed test that fails to look beyond avoided energy costs to the full range of health, safety, and environmental benefits risks excluding programs serving low-income customers from utility portfolios. These benefits are especially critical for low-income households overburdened by high energy costs and other health and economic challenges. Comprehensive and balanced cost-effectiveness screening is thus essential for directing investment toward meeting the needs of these historically underserved customers.

As the *Scorecard* has tracked in the past, approaches for accounting for these unique low-income benefits typically take several forms:

- an explicit (or in some cases, implied) exemption from achieving cost-effectiveness (e.g., Arizona, Iowa, Michigan, Minnesota, Oregon);
- application of a generic percentage "adder" to approximate the additional health and safety benefits they provide (e.g., Colorado, New Mexico, Vermont); or
- efforts to more specifically calculate and quantify associated nonenergy benefits into the cost-effectiveness calculation (e.g., Massachusetts, California).

Appendix D describes each state's utility cost-effectiveness rules specific to low-income programs.

Tracking of equitable distribution of program participation, benefits, and impacts. Community-based organizations (CBOs) have often emphasized the need for tracking mechanisms and transparency to hold decision makers accountable to equity-related commitments; this was highlighted in discussions with CBOs through the ACEEE-convened

Leading with Equity Initiative. While utilities often track basic data related to household energy usage and participation in income-qualified programs, few track metrics related to household race, spoken language, energy-related health impacts, or representation of disinvested groups in decision-making processes. Fewer still track customer demographic data in combination with geographic data to monitor service distribution and identify high-need areas (Drehobl 2021).

Responding to growing calls for a more comprehensive and transparent tracking of equity-focused data, several states and utilities have undertaken efforts to update reporting practices in coordination with community stakeholders and informed by findings from equity-focused utility proceedings. Recent examples include the following:

- **Massachusetts'** 2022–2024 statewide energy efficiency plan approved in early 2022 has introduced a new equity targets framework with a focus on groups that have historically participated at lower rates, including renters/landlords, moderate-income customers, English-isolated families, and microbusinesses.[24]
- **Energy Trust of Oregon**'s 2018 Diversity, Equity, and Inclusion Operations Plan lays out 10 key goals and outcomes to advance DEI, including goals to increase customer participation in energy efficiency programs, with strategies and subgoals for residential, commercial, and industrial sectors.[25]
- The **California Energy Commission** tracks projects located in disadvantaged communities using CalEnviroScreen 4.0, a mapping tool that helps identify California communities that are most affected by many pollution sources, and where people are often especially vulnerable to pollution's effects.[26] CalEnviroScreen ranks communities based on state and federal government data to determine areas experiencing higher pollution burdens. The CEC also conducts an annual Diversity Report that contains information about programs located in and benefitting disadvantaged communities.

Intervenor compensation. Utility regulatory decisions have the potential to profoundly impact the lives of all customers and society more broadly through their influence on customer energy bills, siting of energy infrastructure, and resulting pollution and air quality effects. However, regulatory proceedings can be prohibitively technical, expensive, and time-consuming, thus posing a significant barrier for non-utility stakeholders or individuals

[24] https://ma-eeac.org/wp-content/uploads/Attachment-B-Equity-Targets-Framework-Final.pdf

[25] https://apps.puc.state.or.us/orders/2020ords/20-048.pdf

[26] https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40

wishing to participate. While utilities can hire attorneys and expert consultants to represent their positions in proceedings, typically at ratepayers' expense, smaller customers without such resources are often unable to make their voices heard.

Many states have taken steps to address this inequity by providing intervenor compensation for certain individuals or groups, reimbursing them for the costs of their involvement. According to a 2021 report by the National Association of Regulatory Utility Commissioners (NARUC), 16 U.S. states have authorized intervenor compensation.[27] Intervenors are actively making use of this policy in six of these states: California, Idaho, Michigan, Minnesota, Oregon, and Wisconsin.

Recent examples include the Oregon Energy Affordability Act (2021), which has an array of new provisions intended to support marginalized energy customers, including enabling utilities to consider equity-related factors in determining customer energy rates, and calling for a process to provide financial assistance for organizations representing energy-burdened people in regulatory processes. By enabling historically excluded or overlooked individuals to participate, intervenor compensation improves energy planning by facilitating more informed decision-making that considers the impacts to all customers.

Scores for Support of Low-Income Energy Efficiency Programs

In ACEEE's data request to states and utility commissions, we asked for information about the policy instruments discussed above. We also asked for specific levels of spending on low-income energy efficiency programs by states and utilities. This is distinct from funding provided by federal sources, such as DOE grant allocations for the Weatherization Assistance Program (WAP).

A state could earn up to 2 points in this category based on levels of reported spending for low-income households (see table 16).

Table 16. Scoring for support of low-income energy efficiency programs

2021 state spending on low-income programs per income-qualified resident	Points
>$30	2
$20–29.99	1.5

[27] Alaska, California, Colorado, Hawaii, Idaho, Illinois, Kansas, Maine, Michigan, Minnesota, New Hampshire, Oregon, Tennessee, Washington, West Virginia, and Wisconsin.

2021 state spending on low-income programs per income-qualified resident	Points
$10–19.99	1
$5–9.99	0.5
<$5	0

Table 17 shows the results of ACEEE's analysis, including levels of ratepayer-funded spending on low-income energy efficiency programs for states that provided this information through our *Scorecard* data request. These amounts are distinct from bill assistance programs and refer specifically to programs 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. If utility or state funds have been deployed to support or supplement WAP programs or projects, we include them in table 17.

It is important to note that states rely on a variety of funding sources to support energy efficiency measures in low-income households; these include both ratepayer dollars and government funds. For example, although Alaska reports little utility funding for low-income programs, state investment in weatherization on a per capita basis is among the highest in the nation, thanks to appropriations by the state legislature administered through the Alaska Housing Finance Corporation. To credit these efforts in the *State Scorecard* and avoid penalizing states that draw from diverse funding streams, any state-subsidized low-income funds reported by state energy offices in their answers to our data request have been combined with ratepayer funding for low-income programs and annotated accordingly in table 17.

Table 17. State support of low-income energy efficiency programs

State	2021 utility spending on low-income energy efficiency programs	2021 additional state spending on low-income energy efficiency programs	2021 total low-income energy efficiency spending	2021 state spending on low-income programs per income-qualified resident*	Score (2 pts.)
Rhode Island	$18,562,300	$2,225,000[1]	$20,787,300	$79.04	2
Vermont	$10,149,278[2]	—	$10,149,278	$71.98	2
New Hampshire	$14,653,370	$17,963[3]	$14,671,333	$59.40	2
Massachusetts	$61,856,193	$6,753,303	$68,609,496	$46.48	2

State	2021 utility spending on low-income energy efficiency programs	2021 additional state spending on low-income energy efficiency programs	2021 total low-income energy efficiency spending	2021 state spending on low-income programs per income-qualified resident*	Score (2 pts.)
Maine	$3,269,356	$10,394,193[4]	$13,663,549	$45.70	2
California	$370,805,816	$45,818,460[5]	$416,624,276	$38.33	2
District of Columbia	$4,859,366	—	$4,859,366	$30.76	2
Connecticut	$26,052,748	—	$26,052,748	$29.91	1.5
Hawaii	$8,892,837	—	$8,892,837	$26.79	1.5
Illinois	$79,114,329	—	$79,114,329	$26.75	1.5
Maryland	$24,209,061	$6,500,000[6]	$30,709,061	$26.63	1.5
Pennsylvania	$84,565,106	—	$84,565,106	$25.82	1.5
Michigan	$68,627,103	—	$68,627,103	$25.80	1.5
Wisconsin	$37,203,305	—	$37,203,305	$25.52	1.5
New York	$119,423,187	—	$119,423,187	$22.33	1.5
Delaware	—	$4,859,478	$4,859,478	$17.05	1
Virginia	$9,400,000	$21,100,000[7]	$30,500,000	$15.43	1
Minnesota	$16,919,562	—	$16,919,562	$14.85	1
New Jersey	$26,463,347	—	$26,463,347	$12.87	1
Washington	$8,724,488	$10,810,930[8]	$19,535,418	$12.59	1
Colorado	$11,939,717	—	$11,939,717	$10.09	1
Missouri	$14,551,000	—	$14,551,000	$8.60	0.5
Alaska	—	$1,630,260[9]	$1,630,260	$8.58	0.5
Idaho	$3,342,224	—	$3,342,224	$7.11	0.5
Tennessee	$10,697,674	$3,000,000[10]	$13,697,674	$6.43	0.5
Iowa	$4,823,442	—	$4,823,442	$6.35	0.5
Oregon	$3,499,251	$204,618[12]	$3,703,869	$6.10	0.5
Montana	$1,771,910	—	$1,771,910	$6.01	0.5
Arkansas	$6,308,594	—	$6,308,594	$5.48	0.5
Nevada	$3,145,189	$744,147[11]	$3,889,336	$4.23	0
New Mexico	$3,143,287	—	$3,143,287	$3.86	0

State	2021 utility spending on low-income energy efficiency programs	2021 additional state spending on low-income energy efficiency programs	2021 total low-income energy efficiency spending	2021 state spending on low-income programs per income-qualified resident*	Score (2 pts.)
Nebraska	$729,860	—	$729,860	$1.66	0
Utah	$947,751	—	$947,751	$1.32	0
North Carolina	$4,081,735	—	$4,081,735	$1.27	0
Georgia	$3,675,618	—	$3,675,618	$1.10	0
Florida	$3,671,033	—	$3,671,033	$0.55	0
Alabama	—	—	—	—	0
Arizona	—	—	—	—	0
Indiana	—	—	—	—	0
Kansas	—	—	—	—	0
Kentucky	—	—	—	—	0
Louisiana	—	—	—	—	0
Mississippi	—	—	—	—	0
North Dakota	—	—	—	—	0
Ohio	—	—	—	—	0
Oklahoma	—	—	—	—	0
South Carolina	—	—	—	—	0
South Dakota	—	—	—	—	0
Texas	—	—	—	—	0
West Virginia	—	—	—	—	0
Wyoming	—	—	—	—	0

***2021 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 2021 Current Population Survey Annual Social and Economic Supplement. [1]RGGI Weatherization for Moderate Income Households and Small Businesses. [2]Vermont Home Weatherization Assistance Program Fund. [4]MaineHousing's Heat Pump, Weatherization, and Assurance Programs; NECEC Settlement; Maine Power and Reliability Settlement; Forward Capacity Market revenues; VW Settlement. [5]Low-Income Weatherization, Transformative Climate Communities, Building Initiative for Low-Emissions Development (BUILD), Technology and Equipment for Clean Heating (TECH). [6]Strategic Energy Investment Fund. [7]DHCD Weatherization Deferral Repair Program, Affordable and Special Needs Housing Program. [8]Washington Department of Commerce–funded programs: Weatherization Plus Health, Fuel-Switching Program, Community Energy Efficiency Program (CEEP). [9]Alaska Housing Finance Corporation Weatherization.**

[10]TDEC Office of Energy Programs. [11]Home Energy Retrofit Opportunities for Seniors. [12]State Home Oil Weatherization Program.

SCORES FOR POLICIES ADVANCING EQUITABLE UTILITY-SECTOR EFFICIENCY

This category recognizes state-adopted utility policies to advance equitable energy planning and strengthen investment in low-income programs through policies discussed above: minimum spending targets, cost-effectiveness test design principles, and policies enabling intervenor compensation for underrepresented groups.

A state could earn up to 1.5 points in this category. To earn full credit, a state must have adopted at least three of the four following policies:

- A legislative or regulatory requirement establishing minimum spending and/or savings levels for efficiency programs aimed specifically at low-income households.
- Cost-effectiveness screening practices that include special provisions recognizing additional equity benefits from low-income energy efficiency programs.
- Inclusion of health and safety, societal, and/or participant benefits within cost-effectiveness screening practices.
- Tracking and reporting of equity-related data, including participation and investments among historically underserved customers and high-need areas, ideally including geographic distribution of impacts and benefits.
- An active intervenor compensation program for groups that would like to participate in PUC proceedings but lacking funding or resources to do so. Table 18 shows the states with legislative or statutory language authorizing such programs; however, unless such a program is active, states do not receive points in this category.

Table 18. Scores for policies advancing equitable utility-sector efficiency

State	Requirements for minimum level of state or utility support of low-income programs	Special cost-effectiveness screening provisions or exceptions for low-income programs	Inclusion of health and safety NEBs within cost-effectiveness testing	Equity-focused program tracking metrics	Intervenor compensation	Score (1.5 pts.)
California	Yes[c]	Yes[f]		Yes	Active	1.5
Colorado	Yes[a]	Yes[g]	Yes	—	Authorized	1.5
Connecticut	Yes[abc]	Yes[e]	Yes	Yes	—	1.5
Delaware	Yes[a]	Yes[d]	Yes	—	—	1.5
District of Columbia	Yes[a]	Yes[g]	Yes	—	—	1.5
Idaho	—	Yes[g]	Yes	—	Active	1.5
Illinois	Yes[a]	Yes[e]	—	—	Authorized*	1.5

State	Requirements for minimum level of state or utility support of low-income programs	Special cost-effectiveness screening provisions or exceptions for low-income programs	Inclusion of health and safety NEBs within cost-effectiveness testing	Equity-focused program tracking metrics	Intervenor compensation	Score (1.5 pts.)
Maine	Yes[a]	Yes[d]	—	Yes	Authorized*	1.5
Massachusetts	Yes[a]	Yes[d]	Yes	Yes	—	1.5
Michigan	Yes[a]	Yes[e]	—	—	Active	1.5
Minnesota	Yes[a]	Yes[e]	—	—	Active	1.5
Nevada	Yes[a]	Yes[e]	Yes	—		1.5
New Hampshire	Yes[a]	Yes[e]	Yes	—	Authorized	1.5
Oregon	Yes[a]	Yes[e]	Yes	Yes	Active	1.5
Vermont	Yes[a]	Yesg	Yes	—	—	1.5
Washington	—	Yes[e]	Yes	Yes	Authorized*	1.5
Wisconsin	Yes[a]	Yes[e]	Yes	—	Active	1.5
Kentucky	—	Yes[e]	—	Yes	—	1
Missouri	—	Yes[e]	Yes	—	—	1
Montana	Yes[a]	Yes[e]	—	—	—	1
New Jersey	—	Yes[e,g]	Yes	—	—	1
New Mexico	Yes[a]	Yes[g]	—	—	—	1
New York	Yes[a]	Yes[e]	—	—	—	1
Oklahoma	Yes[a]	Yes[f]	—	—	—	1
Pennsylvania	Yes[bc]	Yes[e]	—	—	—	1
Rhode Island	—	Yes[d]	Yes	—	—	1
Texas	Yes[a]	Yes[e]	—	—	—	1
Virginia	Yes[a]	Yes[e]	—	—	—	1
Arizona	—	Yes[e]	—	—	—	0.5
Arkansas	—	Yes[e]	—	—	—	0.5
Florida	—	Yes[e]	—	—	—	0.5
Georgia	—	Yes[e]	—	—	—	0.5
Hawaii	—		—	Yes	Authorized	0.5
Indiana	—	Yes[e]	—	—	—	0.5

State	Requirements for minimum level of state or utility support of low-income programs	Special cost-effectiveness screening provisions or exceptions for low-income programs	Inclusion of health and safety NEBs within cost-effectiveness testing	Equity-focused program tracking metrics	Intervenor compensation	Score (1.5 pts.)
Iowa	—	Yes[e]	—	—	—	0.5
Kansas	—	Yes[e]	—	—	Authorized	0.5
Maryland	—	Yes[e]	—	—	—	0.5
Mississippi	—	Yes[e]	—	—	—	0.5
North Carolina	—	Yes[e]	—	—	—	0.5
Ohio	—	Yes[e]	—	—	—	0.5
South Carolina	—	Yes[e]	—	—	—	0.5
Tennessee	—	Yes[e]	—	—	Authorized	0.5
Utah	—	Yes[g]	—	—	—	0.5
Alaska	—	—	—	—	Authorized	0
Alabama	—	—	—	—	—	0
Louisiana	—	—	—	—	—	0
Nebraska	—	—	—	—	—	0
North Dakota	—	—	—	—	—	0
South Dakota	—	—	—	—	—	0
West Virginia	—	—	—	—	Authorized	0
Wyoming	—	—	—	—	—	0

***Though our scoring methodology generally awards points only to currently active intervenor compensation programs, we allowed an exception for states having only authorized such programs since 2021 or later. For example, Washington State and Illinois each passed legislation in 2021 authorizing intervenor, but have yet to establish formal programs. We may revisit their scores in the future. [a]A required level of spending on low-income energy efficiency has been established. [b]A required savings goal for low-income energy efficiency has been established. [c]A customer participation goal has been established. [d]Quantifiable low-income NEBs are included in cost–benefit calculations. [e]Low-income programs are not required to pass, or are exempted from passing, cost-effectiveness tests. [f]Cost-effectiveness threshold is lowered to accommodate low-income programs. [g]A multiplicative adder is applied to approximate low-income NEBs.**

Chapter 3. Transportation Policies

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INTRODUCTION

The transportation sector is the largest source of GHG emissions in the United States and accounts for approximately 27% of economy-wide GHG emissions (EPA 2022a). At the federal, state, and local levels, a comprehensive approach to transportation GHG emissions includes addressing the energy efficiency of both individual vehicles and the transportation system as a whole, particularly its interrelationship with land-use policies. While the federal government helps to reduce transportation GHG by setting national standards for both light- and heavy-duty vehicles, states and local governments continue to lead the way in creating policies for other aspects of transportation efficiency and GHG reduction.

Scores for the transportation category reflect state actions that go beyond federal policies to achieve a more energy-efficient, low-carbon transportation sector. These may be measures to improve the efficiency of vehicles purchased or operated in the state, policies to promote more efficient modes of transportation, or steps to integrate land-use and transportation planning in order to reduce the need to drive. To emphasize the creation of equitable transportation policies, we have added a new metric this year relating to equitable EV deployment.

SCORING AND RESULTS

We awarded points to states based on their efforts to support efficient transportation through policy and funding. We also considered the current adoption rates for high-efficiency vehicles and EV charging infrastructure. Points were distributed as follows:

- California standards (*2 points total*)
    - Tailpipe emissions standards (1 point)
    - Light-duty ZEV program (0.5 points)
    - (NEW) Medium & heavy-duty ZEV program (0.5 points)
- High-efficiency vehicle incentives and outcomes (*1.5 points total*)
    - High-efficiency vehicle tax credits and rebates (0.5 points)
    - Light-duty EV registrations (0.5 points)
    - (NEW) Medium and heavy-duty EV registrations (0.5 points)
- VMT and transportation GHG reduction (*2 points total*)
    - VMT or transportation-specific GHG targets (1 point)
    - Percentage change in VMT (1 point)
- Smart growth statutes (*1 point*)
- Transit funding and legislation (*2 points*)
    - Transit funding (1.5 points)
    - Transit legislation (0.5 points)
- Freight planning (*0.5 point*)

- EV fees (*0.5 points*)
- Electric vehicle supply equipment (EVSE) infrastructure (*1 point*)
- Low-income and transportation equity (*2 points*)
    - Low-income transit-oriented development policy (1 point)
    - (NEW) Funding for low-income and equitable electrification programs (1 point)

As the federal government takes steps to finalize the next round of light- and heavy-duty GHG standards, state leaders are prioritizing their continued progress on high-efficiency vehicles.[28]

We awarded states that adopted California's vehicle-emissions standards 1 point. Given the efficiency gains achievable through vehicle electrification, we gave states that also adopted California's light-duty ZEV program 0.5 points, and states that have adopted California's medium-duty and heavy-duty ACT rule an additional 0.5 points. States with 170 or more light-duty EVs per 100,000 people earned 0.5 points, and states with at least 75 medium- and heavy-duty EVs per 100,000 people earned an additional 0.5 points. Similarly, states with 30 public charging ports per 100,000 people earned 1 point, and those with at least 15 public charging ports per 100,000 people earned 0.5 points. The only chargers we counted were non-brand-specific Level 2 (L2) and direct-current fast chargers (DCFC) with CHAdeMO, Combined Charging System (CCS), or J1772 compatibility that were installed as of May 18, 2022.[29] We also evaluated state fees for EVs and awarded 0.5 point to states that have no EV fee or a fee that is less than or equal to 100% of the annual average gasoline tax revenue paid by the average driver of an internal combustion engine (ICE) vehicle. States in which the EV fee is 101–125% of gasoline tax revenues earned no points, and those with an EV fee greater than 125% of gasoline revenues lost 1 point. We awarded 0.5 points to states with consumer incentives for the purchase of high-efficiency vehicles.

States can also lead in improving the efficiency of transportation systems more broadly, which will be critical to meeting GHG reduction targets and complementing efforts to advance efficient vehicles and EVs. This includes taking steps to promote the use of less energy-intensive transportation modes. States that have a dedicated revenue stream for

[28] Fuel economy standards adopted for model years 2022–2025 were provisional, and both fuel economy and GHG emissions standards for these model years, as well as for MY 2021, are currently under review.

[29] L2 and DCFC chargers are different forms of EVSE chargers. L2 chargers have a minimum voltage of 240 volts and DCFC chargers have a minimum voltage of 480 volts. CHAdeMO, CCS, and J1772 fittings were the only style of charger fitting that we scored for in this year's scorecard.

public transit earned 0.5 points in this year's *State Scorecard*. Twenty-five states have statutes that provide sustainable funding sources for transit-related capital and/or operating expenses. States also received points based on the magnitude of their transit spending. Average per capita spending over a five-year period of $200 or more received 1.5 points, spending of $100 or more received 1 point, and expenditures of $20 or more received 0.5 points.

Policies that promote compact development and ensure the accessibility of major destinations are essential to reducing long-term transportation energy use and GHG emissions. States with smart growth statutes earned 1 point; 23 states earned points in this category. Their statutes include the creation of zoning overlay districts, such as the New Hampshire RSA 9-B program, as well as requirements for state agencies to consider smart growth principles in funds distribution, new construction, and capital improvement projects (New Hampshire Council on Resources and Development 2016).

States that adopted statewide VMT reduction targets or transportation-specific GHG reduction goals were also eligible for 1 point. Only nine states earned points in this category. We also calculated the percentage change in VMT per capita over a 10-year period for three time frames—2009–2018, 2010–2019, and 2011–2020—and averaged them to evaluate a given state's trend in VMT growth. We awarded 1 point to states whose average 10-year VMT per capita figure fell by 5% or more between 2016 and 2018. A reduction of 1% or more (below 5%) earned 0.5 points. Only New York and the District of Columbia earned the full point for this metric.

Regarding freight system efficiency, states could earn 0.5 points if their freight plan objectives specifically include reducing GHG emissions or energy consumption or shifting modes to more efficient forms of freight movement. They earned an additional 0.5 points if their freight plans include an energy intensity, GHG reduction, or mode-share goal. California is the only state to earn that credit, for its freight-related GHG reduction goal.

We also evaluated state policies that encourage equitable access to efficient transportation options. States earned 0.5 points if they have policies in place to encourage inclusion of low-income housing in transit-oriented neighborhoods. These policies include grant and loan programs geared toward funding affordable housing in transit-oriented-development (TOD) areas, first- and last-mile connectivity initiatives, and public transit grant programs focused on easing access for low-income residents. States could also earn 0.5 points if they use distance from transit facilities as a criterion for awarding federal low-income tax credits to qualifying property owners. Additionally, states earned 1 point if they have a dedicated funding stream for EV and EV charging deployment (EVSE) in low-income, environmental justice, and underserved communities.

Table 19 shows state scores for transportation policies. ACEEE recognizes that, due to variations in geography and urban/rural composition, some states cannot feasibly

implement some of the policies mentioned in this chapter. Nevertheless, every state can make additional efforts to reduce its transportation energy use, and this chapter illustrates several approaches. Details on incentives for purchasing high-efficiency vehicles, state transit funding, and transportation legislation are included in Appendices G, H, and I.

Table 19. Transportation policies by state

State	GHG tailpipe emissions standards (1 pt.)[1]	CA ZEV mandate (1 pt.)[2]	EV registrations per 100,000 people (1 pt.)[3]	High-efficiency vehicle consumer incentives (0.5 pts.)[4]	VMT targets (1 pt.)[5]	Average % change in VMT per capita (1 pt.)[6]	Smart growth and land use planning (1 pt.)[7]	Transit funding (1.5 pts.)[8]	Transit legislation (0.5 pts.)[9]	Freight plans and EE goals (1 pt.)[10]	EV fees (0.5 pts.)[11]	EVSE (1 pt.)[12]	Equitable transportation access (1 pt.)[13]	Equitable transportation electrification (1 pt.)[14]	Score totals (13 pts.)
California	1	1	1	0.5	1	1	1	0.5	0.5	1	0.5	1	1	1	12
Massachusetts	1	1	1	0.5	1	0	1	1.5	0.5	0.5	0.5	1	1	1	11.5
New York	1	1	1	0.5	1	1	1	1.5	0.5	0.5	0.5	0.5	0.5	1	11.5
District of Columbia	1	0.5	1	0.5	1	1	1	1	0	0.5	0.5	1	1	1	11
Connecticut	1	1	1	0.5	0.5	0.5	1	1	0	0.5	0.5	0.5	1	1	10
Maryland	1	0.5	1	0.5	1	0.5	1	1	0.5	0.5	0.5	1	1	0	10
Oregon	1	1	1	0.5	1	0.5	1	0	0.5	0.5	0.5	1	0.5	1	10
Washington	1	1	1	0.5	1	1	1	0	0.5	0.5	0.5	1	0.5	0	9.5
Vermont	1	0.5	1	0.5	1	1	1	0	0	0.5	0.5	1	0	1	9
Maine	1	0.5	0.5	0.5	1	0	1	0	0.5	0.5	0.5	1	0.5	1	8.5
Minnesota	1	0.5	1	0	1	1	0	0.5	0.5	0.5	0.5	0.5	1	0	8
Delaware	1	0.5	1	0.5	0	0	1	1	0	0.5	0.5	0.5	0	1	7.5
Rhode Island	1	0.5	0.5	0	0	1	1	0.5	0	0.5	0.5	1	1	0	7.5
Virginia	1	0.5	1	0.5	0	1	1	0.5	0.5	0	0.5	0.5	0.5	0	7.5
New Jersey	1	1	1	0.5	0	0.5	1	0.5	0	0.5	0.5	0	0.5	0	7

State	GHG tailpipe emissions standards (1 pt.)[1]	CA ZEV mandate (1 pt.)[2]	EV registrations per 100,000 people (1 pt.)[3]	High-efficiency vehicle consumer incentives (0.5 pts.)[4]	VMT targets (1 pt.)[5]	Average % change in VMT per capita (1 pt.)[6]	Smart growth and land use planning (1 pt.)[7]	Transit funding (1.5 pts.)[8]	Transit legislation (0.5 pts.)[9]	Freight plans and EE goals (1 pt.)[10]	EV fees (0.5 pts.)[11]	EVSE (1 pt.)[12]	Equitable transportation access (1 pt.)[13]	Equitable transportation electrification (1 pt.)[14]	Score totals (13 pts.)
Colorado	1	0.5	1	0.5	0.5	0	0	0	0.5	0.5	0.5	1	0.5	0	6.5
Illinois	0	0	1	0.5	0	1	1	1	0.5	0.5	0	0	0.5	0	6
Pennsylvania	1	0	0.5	0.5	0	0.5	0	1	0.5	0.5	0.5	0.5	0	0	5.5
Arizona	0	0	1	0.5	0	0.5	1	0	0	0.5	0.5	0.5	0.5	0	5
Florida	0	0	1	0	0	1	0	0	0.5	0.5	0.5	0.5	1	0	5
Hawaii	0	0	1	0	0	0	1	0	0.5	0.5	0.5	1	0.5	0	5
Michigan	0	0	0.5	0	0	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0	5
Nevada	1	0.5	1	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0	4.5
New Hampshire	0	0	1	0	0	0.5	1	0	0	0.5	0.5	0.5	0	0	4
North Carolina	0	0	1	0	0	0	1	0	0.5	0.5	0.5	0.5	0	0	4
Utah	0	0	1	0.5	0	0	0	0	0.5	0.5	0.5	1	0	0	4
Missouri	0	0	0	0	0	0	0	0	0	0.5	0	1	1	1	3.5
Tennessee	0	0	0	0	0	0	1	0	0.5	0.5	0.5	0.5	0.5	0	3.5
Kentucky	0	0	0	0	0	1	0	0	0	0.5	0.5	0	1	0	3
New Mexico	1	0.5	0	0	0	0	0	0	0	0.5	0.5	0	0.5	0	3
Iowa	0	0	0	0	0	0	1	0	0.5	0.5	0.5	0	0	0	2.5

State	GHG tailpipe emissions standards (1 pt.)[1]	CA ZEV mandate (1 pt.)[2]	EV registrations per 100,000 people (1 pt.)[3]	High-efficiency vehicle consumer incentives (0.5 pts.)[4]	VMT targets (1 pt.)[5]	Average % change in VMT per capita (1 pt.)[6]	Smart growth and land use planning (1 pt.)[7]	Transit funding (1.5 pts.)[8]	Transit legislation (0.5 pts.)[9]	Freight plans and EE goals (1 pt.)[10]	EV fees (0.5 pts.)[11]	EVSE (1 pt.)[12]	Equitable transportation access (1 pt.)[13]	Equitable transportation electrification (1 pt.)[14]	Score totals (13 pts.)
North Dakota	0	0	0	0	0	0.5	1	0	0	0.5	0	0.5	0	0	2.5
Texas	0	0	1	0.5	0	0	0	0	0	0.5	0.5	0	0	0	2.5
Alaska	0	0	0	0	0	0	0	1.5	0	0	0.5	0	0	0	2
Georgia	0	0	1	0	0	0	0	0	0.5	0	–0.5	0.5	0.5	0	2
Oklahoma	0	0	0	0	0	1	0	0	0	0.5	0.5	0	0	0	2
Indiana	0	0	0	0	0	0	0	0	0.5	0.5	0	0	0.5	0	1.5
Kansas	0	0	0	0	0	0	0	0	0.5	0.5	0	0.5	0	0	1.5
Nebraska	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0	0	1.5
Idaho	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Louisiana	0	0	0	0	0	0	0	0	0	0.5	0.5	0	0	0	1
Montana	0	0	0	0	0	0	0	0	0	0.5	0.5	0	0	0	1
South Carolina	0	0	0	0	0	0	0	0	0	0.5	0.5	0	0	0	1
South Dakota	0	0	0	0	0	0.5	0	0	0	0	0.5	0	0	0	1
West Virginia	0	0	0	0	0	0.5	0	0	0.5	0	0	0	0	0	1
Wisconsin	0	0	0	0	0	0	0	0	0	0.5	0.5	0	0	0	1
Alabama	0	0	0	0	0	0	0	0	0.5	0.5	–0.5	0	0	0	0.5

State	GHG tailpipe emissions standards (1 pt.)[1]	CA ZEV mandate (1 pt.)[2]	EV registrations per 100,000 people (1 pt.)[3]	High-efficiency vehicle consumer incentives (0.5 pts.)[4]	VMT targets (1 pt.)[5]	Average % change in VMT per capita (1 pt.)[6]	Smart growth and land use planning (1 pt.)[7]	Transit funding (1.5 pts.)[8]	Transit legislation (0.5 pts.)[9]	Freight plans and EE goals (1 pt.)[10]	EV fees (0.5 pts.)[11]	EVSE (1 pt.)[12]	Equitable transportation access (1 pt.)[13]	Equitable transportation electrification (1 pt.)[14]	Score totals (13 pts.)
Arkansas	0	0	0	0	0	0	0	0	0.5	0.5	–0.5	0	0	0	0.5
Mississippi	0	0	0	0	0	0.5	0	0	0	0.5	–0.5	0	0	0	0.5
Ohio	0	0	0	0	0	0	0	0	0	0.5	–0.5	0.5	0	0	0.5
Wyoming	0	0	0	0	0	0	0	0	0	0.5	–0.5	0	0	0	0

Source: [1]Lutsey and Slowik 2019. [2]CARB 2022 [3]IHS Automotive Polk 2022; state data requests. [4] DOE 2022a. [5]State legislation. [6]FHWA 2022. [7]State legislation. [8]AASHTO 2022. [9]State legislation. [10]State freight plans. [11]DOE 2022b. [12]DOE 2022b. [13]State legislation. [14]State legislation; state data requests.

DISCUSSION

Tailpipe Emissions Standards and the Zero-Emission Vehicle Program

The U.S. Department of Transportation (DOT) has regulated automobile fuel economy since the Corporate Average Fuel Economy (CAFE) standards were adopted in 1975. States are not permitted to adopt fuel efficiency standards per se. As a longtime leader in vehicle emissions reduction, however, California has authority to set its own vehicle emissions standards, including for GHG emissions. Other states may choose to follow federal or California standards. In 2002, California passed the Pavley Bill (AB 1493), the first U.S. law to address GHG emissions from vehicles. The GHG reductions from this law were expected to be achieved largely through improved fuel efficiency, making these standards, to a large degree, energy efficiency policies. Given auto manufacturers' preference for regulatory regimes that allow them to offer identical vehicles in every state, California's program has been instrumental in prodding the federal government to continue increasing the stringency of vehicle standards, drawing new efficiency technologies into the market.

Pursuant to the *Massachusetts v. Environmental Protection Agency* court decision in 2007, the EPA began regulating vehicle GHG emissions as well. Starting with model year 2012, the EPA, DOT, and California Air Resources Board (CARB) have harmonized their standards for fuel economy and GHG emissions. In 2010, these agencies set new GHG and fuel economy standards for model years 2012–2016. In 2012, the agencies extended the standards to model years 2017–2025, projecting a fleetwide GHG emissions average of 54.5 miles per gallon by 2025. The DOT standards for model years 2022–2025 were provisional, and all three agencies were to participate in a midterm review of the appropriateness of the final four years of the standards. In early 2017, EPA and CARB determined that these standards remained appropriate.

The Trump administration reopened EPA's midterm review shortly after the inauguration in 2017; in April 2018, the EPA released a new determination that these future standards were no longer appropriate. A joint DOT and EPA rule rolling back the standards for model years 2021–2026 was finalized in April 2020. The administration also revoked California's authority to set GHG standards in the fall of 2019, although this power has since been restored by the Biden administration (The White House 2021a). In December 2021 and March 2022, the EPA and DOT, respectively, finalized their replacements to the standards finalized under the Trump administration for model years 2023–2026. These standards restore most of the benefits of the original Obama administration standards and project a fleetwide average efficiency of 49 mpg (EPA 2022b). California has also updated its ZEV program, requiring a more ambitious increase in sales of light-duty plug-in hybrid, battery electric, and fuel-cell vehicles from 2018–2025 in order to reduce GHG and criteria pollutant emissions. Manufacturers of passenger cars and light trucks (up to 8,500 pounds) must earn a certain number of ZEV credits by meeting state requirements for the number and type of ZEVs they must produce and deliver for sale (C2ES 2017).

While the heavy-duty EV market is in its early stages, the potential for emission reductions is substantial. States are starting to implement policies for ramping up heavy-duty EV deployment. CARB recently approved ACT, the first zero-emission commercial truck requirement in the United States. In 2024, it will require manufacturers of medium- and heavy-duty vehicles to sell ZEVs as an increasingly large percentage of their total sales until 2035. Other states are considering action in this area as well, pledging to make sales of all new medium- and heavy-duty vehicles in their jurisdictions zero emission by no later than 2050. Governors of 17 states and the mayor of the District of Columbia have signed a memorandum of understanding (MOU) to develop a Zero-Emission Medium- and Heavy-Duty Vehicle Action Plan to inform heavy-duty EV actions in their jurisdictions. Currently, Massachusetts, New Jersey, New York, Oregon, and Washington have adopted California's heavy-duty ZEV program, and Colorado, the District of Columbia, Hawaii, Maine, Maryland, North Carolina, Pennsylvania, Rhode Island, and Vermont have all signed an MOU for the heavy-duty ZEV.

California's GHG regulations are now used by the District of Columbia and 17 states: Colorado, Connecticut, Delaware, Maine, Maryland, Massachusetts, Minnesota, Nevada, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, Vermont, Virginia, and Washington. (Arizona and Florida also adopted California's standards but repealed them in 2012.) New Mexico is the most recent state to adopt these standards, finalizing its rule in May 2022. California's light-duty ZEV requirements have been adopted by the District of Columbia and 16 states: Colorado, Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, Minnesota, Nevada, New Jersey, New Mexico, New York, Oregon, Rhode Island, Vermont, Virginia, and Washington.

California's updated ZEV programs, if adopted by committed states, would greatly increase the number of light- and heavy-duty EVs on the road and accelerate the automotive industry's transition to electrification beyond what is currently federally required. Full adoption of these programs would also help the United States meet the Biden administration's goal—announced in late 2021—to make the federal government carbon neutral by 2050 (The White House 2021b).

Electric Vehicle and Charging Infrastructure Deployment

As more EVs are available to drivers and EVs become a critical part of state strategy to address transportation GHG emissions, states can help remove the barriers to widespread EV adoption. In addition to reducing the higher up-front costs of these vehicles, states can provide incentives for the construction of the required fueling infrastructure. Additionally, states can offer nonfinancial benefits—such as emissions testing exemptions—that make it more convenient to own an EV. Support provided through increased charging network accessibility and incentives can provide benefits to purchasers of both light-duty and medium/heavy-duty vehicles alike. The number of EV registrations and publicly available

charging ports per capita in a given state are indicative of the success of a state's policies to increase EV uptake.

Light-Duty State EV Fees

Projections forecast a steep increase in the rate of light-duty EV penetration across the country. As EV sales begin to ramp up, some states have applied additional registration fees to these vehicles. To date, 28 states have done so, including Arkansas, Connecticut, and North Dakota. Bills on the table across the country propose annual fees ranging from $25 (New Mexico) to $213 (Georgia). Judging from a review of a small sample of state bills, the primary motivation for these fees is to replace lost future gasoline tax revenues that fund road maintenance. One state, Washington, intends to use the funds for a different purpose: building out EV charging infrastructure to support increased deployment.

While it makes sense for all vehicle owners to contribute to maintaining the roads they drive on, these surcharges bring several issues to light. First, EV fees can be at odds with state targets for EV deployment. Numerous states have tax credits in place to encourage EV sales (see Appendix G), yet they also have high additional registration costs for EV drivers. These policies work against each other (Tomich 2019).

Moreover, these fees in some cases exceed what the driver of an average gasoline-fueled car pays in gas taxes. Some states' EV fees are based on inaccurate tax calculations that use high annual VMT figures and low average vehicle fuel economy. As an example, North Carolina's first EV fee was set by assuming that the average vehicle in the state is driven 15,000 miles a year—which is much more than the average gasoline vehicle in the United States—and that the average state vehicle gets a mere 20 miles per gallon, resulting in more than $270 annually in gasoline taxes (Stradling 2019). Finally, EV fees in many states do not account for the fact that EV owners pay other taxes that owners of gasoline-powered vehicles do not.

In any case, there is little justification for high surcharges on advanced-technology vehicles, and such charges will disincentivize the development of technologies that reduce emissions. In fact, some EV fee proposals appear to be designed for that purpose. The American Legislative Exchange Council, which receives funding from fossil fuel interests, pushed for steep EV fees in states and campaigned against the federal EV tax credit in 2018 and 2019 (Lunetta 2018). The aim of our scoring approach for this metric is to balance the need for states to promote EV sales in what is still a relatively new market with the need for users to pay their fair share of road costs. We have scored states by comparing their EV fees with the amount of gasoline tax revenue collected for the average car. We recognize that this is not a full accounting of the fees that an EV driver might pay compared with what a driver of a conventional vehicle might pay; for instance, we know EV drivers pay state taxes on the electricity they use to charge their vehicles (albeit a very small charge compared with gasoline tax spending). Still, we think this is a simple and reasonable methodology.

Incentives for High-Efficiency Vehicles

When fuel-efficient vehicles contain new, advanced technologies, high purchase cost is a barrier to their entry into the marketplace. To encourage consumers to purchase fuel-efficient vehicles, states may offer a number of financial incentives, including tax credits, rebates, and sales tax exemptions. Several states offer tax incentives to purchasers of alternative-fuel vehicles—including those that run on compressed natural gas, ethanol, propane, or electricity—and in some cases to purchasers of hybrid vehicles (electric or hydraulic). Although alternative-fuel vehicles can provide environmental benefits by reducing pollution, they are not necessarily more fuel efficient, and we did not credit policies that promote their purchase in the *State Scorecard*. However, we did credit incentives for plug-in vehicles and hybrids, which do generally have high fuel efficiency. Given the arrival of a wide range of these vehicles in recent years, tax credits are playing an important role in spurring their adoption.

We did not give credit for the use of high-occupancy vehicle lanes and preferred parking programs for high-efficiency vehicles, as they promote increased vehicle use and consequently may not deliver net energy benefits.

Vehicle Miles Traveled (VMT) Growth and VMT Reduction Targets

Improved vehicle efficiency will not adequately address energy use and GHG emissions in the transportation sector in the long term if total VMT growth goes unchecked. EIA predicts a 20% increase in light-duty VMT between 2018 and 2050 due to rising incomes and population growth. VMT for all vehicle types is expected to increase by 1.1% annually over the next 20 years (EIA 2019). Reducing VMT growth is key to managing transportation energy use, and several states have taken on this challenge by setting VMT reduction targets.

Integration of Land-Use and Transportation Planning

Success in achieving VMT reduction targets requires the coordination of transportation and land-use planning. Successful strategies vary among states due to differences in their infrastructure, geography, and political environment. However, all states benefit from adopting core principles of smart growth and integrating transportation and land-use planning in order to increase transportation system efficiency. Integrated approaches include measures that encourage the following:

- Transit-oriented development, including mixed land use (combining jobs, stores, and housing) and good street connectivity to make neighborhoods friendly to all modes of transportation
- Areas of compact development
- Convenient modes of transportation that provide alternatives to driving
- Centers of activity where popular destinations are close together and accessible by multiple transportation modes

State Transit Funding

While states receive some federal funds for public transit, a significant proportion of transit funding comes from state budgets. A state's investment in public transit is a key indicator of its interest in promoting energy-efficient modes of transportation.

Dedicated Transit Revenue Streams

As states face increasingly uncertain federal funding streams and federal transportation policies that remain highway focused, many have taken the lead in finding dedicated funding sources for long-term public transit expenditures. A number of states have adopted a legislative approach to generating a sustainable stream of capital and operating funds. For instance, Alabama established a trust fund under the Alabama Public Transportation Act in 2018 to increase the state's public transportation options.

Freight

Freight transportation accounted for 30.2% of U.S. transportation-sector GHG emissions in 2018, up from 23.6% in 1990 (EPA 2020). While transporting goods is largely a private sector activity, state and federal policies and investment decisions help to shape the freight system in important ways, including modal diversity and efficiency. A growing amount of federal funding is available for freight projects, in recognition of the importance of freight movement to the economy as well as the congestion and emissions it produces. The Infrastructure Investment and Jobs Act (117th Congress 2021), enacted in 2021, provided an enormous infusion of funds to states for transportation projects, including freight projects. In particular, it provides $8 billion in grant funding for Nationally Significant Freight and Highway Projects and $7.15 billion in formula funding for the National Highway Freight Program for FY 2022–2026 (AASHTO 2021), while lifting the cap on multimodal freight project funding in both programs from 10% to 30%.

The federal Fixing America's Surface Transportation Act, adopted in 2015, requires states to have multimodal freight plans in place in order to receive federal funds for freight projects. These plans can be strengthened by supporting greater use of fuel-efficient freight modes and adopting concrete targets or performance measures that establish energy efficiency as a priority for goods movement. Such measures involve tracking and reporting the fuel used for freight movement in the state as a whole and encourage the use of energy efficiency as a criterion for selecting or evaluating freight projects. States can formulate these performance targets in terms of gallons of fuel per ton-mile of freight moved, for example, or grams of GHG emitted per ton-mile of freight, and targets should reflect performance across all freight modes.

Equitable Access to Transportation

As U.S. cities have sprawled and jobs have moved away from urban cores, many low-income communities have become geographically more isolated and inadequately served by affordable, efficient transportation. In such cases, personal vehicles become the only option

for travel—and expenditures for vehicles, including fuel, insurance, and maintenance, can be large and unpredictable. As a result, household transportation costs as a percentage of total income are higher than average for these communities (Pew Charitable Trusts 2016).

States can use policy levers in various ways to ensure fair and equitable access to public transportation and newer shared-use services. Providing incentives to developers who set aside a fixed percentage of low-income housing in transit-served areas helps align housing and transportation choices. Similarly, proximity to transit services is a key measure that many states use in disbursing federal low-income tax credits to qualifying property owners, ensuring that low-income communities are served by a variety of transportation alternatives.

Equitable Transportation Electrification

The current upfront investment required for EVs and their charging equipment can be cost prohibitive for low-income, environmental justice, and economically distressed communities. To make EVs accessible to all, states should include goals and funding streams designed specifically to increase EV adoption within those communities. Establishing dedicated funding streams for EV purchase or charging equipment installation in low-income, environmental justice, and underserved communities is an important step in reducing the effects of geography, household income, and charging access on EV ownership. Placing EVSE in communities can also enhance the EV ownership experience of those who live in certain types of housing, such as multifamily dwellings, and don't have an opportunity to install at home charging (Huether 2021).

Chapter 4. Building Energy Efficiency Policies

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INTRODUCTION

In 2021, buildings used 74% of the electricity sold and 39% of the total energy used in the United States, accounting for 35% of all U.S. carbon dioxide emissions (EIA 2022c).[30] This makes buildings an essential target for energy savings and measures to mitigate climate change, with a particular imperative to reduce on-site combustion of fossil fuels. Buildings have long life spans and retrofits are often complex or costly, so encouraging building efficiency measures during design and construction is one of the most effective ways to reduce building energy consumption. Further, energy efficiency measures can be more cost-effective than renewable supply (Cohn 2021). However, because buildings built prior to 2022 are projected to represent 44% of the commercial building floor area and 67% of the housing inventory in 2050 (EIA 2022b), policies directed toward existing buildings' energy usage is essential to meeting GHG emissions reduction targets. Policies to accelerate existing building retrofits cannot arrive soon enough: To retrofit 80% of the existing U.S. building stock by 2050, annual retrofit rates must increase by about 15-fold for residences and 2-fold for commercial buildings (Nadel and Hinge 2020).

Mandatory building energy codes primarily focus on minimum acceptable levels of energy efficiency for new residential and commercial building construction, as well as major alterations and additions. The 2021 International Energy Conservation Code (IECC) (ICC 2021a), developed in 2019 but thus far adopted only by Montana (with weakening amendments) and Connecticut, represents a significant advance and is estimated by DOE to yield efficiency gains of 9.4% relative to the previous code version (DOE 2021b). The code also offers two new optional appendices ("Zero Energy Home Appendix" and "Zero Code Renewable Energy Appendix") to provide states and cities with pathways to incorporate zero-energy performance requirements into their codes. States themselves have also developed "stretch codes" and other approaches to allow jurisdictions to push beyond minimum code requirements.

The current IECC development cycle is underway with a new American National Standards Institute standard consensus process instituted by the International Code Council (ICC); it remains to be seen what this new process will yield for the 2024 IECC and whether it will meet the ICC's promise to achieve the "maximum level of energy efficiency that is safe, technologically feasible, and life cycle cost effective" (ICC 2021b). ASHRAE's Standing

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

Standard Project Committee (SSPC) 90.1 has also wrapped up work on a 2022 version of that standard; the 2019 version (ASHRAE 2019) has thus far been adopted directly by only one state (Oregon), though it is also an allowable compliance path in the 2021 IECC (adopted by Connecticut and Montana).

Beyond adoption, energy codes and standards are impactful only if they are implemented and complied with. Adoption by states generally lags far behind the most recent code cycles, and a DOE study across 25 states found significant savings were possible from improved compliance in homes (Williams 2019). Increased focus on code implementation that includes the coupling of updates and compliance can be expected with DOE's administration of funding provided under the 2021 Infrastructure Investment and Jobs Act's section on *Cost-Effective Codes Implementation for Efficiency and Resilience* and upcoming funding through the 2022 Inflation Reduction Act.

Targeted energy efficiency funding and energy technology subsidies have been available in many states for decades, but broad existing building energy policies with accountability measures have largely been adopted only in cities and applicable only to large buildings (Samarripas et al. 2021). Building energy transparency policies (e.g., benchmarking, energy rating, and labeling) are intended to promote efficiency by informing building owners and potential buyers and have been adopted by leading cities, but only in a handful of states. Energy audit, retrofit, and retrocommissioning requirements can push owners toward assessing their buildings, identifying energy conservation measures, and making targeted system changes and operational improvements. A BPS sets a specific energy or GHG emissions ceiling and includes a penalty for exceeding those limits. Recent years have seen the initial emergence of such policies in three states and the District of Columbia.

The proliferation of state climate action plans and other state-level efforts to dramatically reduce GHG emissions in recent years further motivate new metrics in this year's *State Scorecard* that focus on building energy decarbonization. Coupling increased renewable electricity supply with electrification of space heating and water heating is the most likely approach to achieve these emissions reductions from building end uses that currently rely on fossil fuels; this is also likely to be the most cost-effective decarbonization approach nearly everywhere in the United States (Nadel and Fadali 2022). We have added a credit for state policies that support and/or encourage fuel switching. We have also added a credit related to stretch codes that make it easy for local jurisdictions to go beyond a state's base energy code. We can expect stretch codes to grow significantly in the coming years with Inflation Reduction Act funding dedicated to zero-energy stretch code adoption and implementation.

Many state climate policies that have been enacted over recent years include specific equity provisions to address existing energy and environmental inequalities and to ensure that vulnerable and underrepresented communities benefit from reducing energy usage and

emissions (Hayes et al. 2022). In this year's *State Scorecard*, we include several metrics with a specific focus on equity and affordable housing for the first time.

METHODOLOGY

Our primary methodological approach is a review and comparison of data requested from state energy offices and PUCs (see Appendix A). We have verified and contextualized this data with publicly available data where available. For equity-focused metrics, we also referenced primary data collected for ACEEE's report on *Pathways to Healthy, Affordable, Decarbonized Housing: A State Scorecard* (Hayes et al. 2022).

Our evaluation of state building energy code stringency is based predominantly on publicly available information and analyses. DOE's Building Energy Codes Program tracks the status of code adoption for residential and commercial buildings (DOE 2022c). While model codes are determined at the national level, states often amend these codes during the adoption process, thereby affecting the energy efficiency of buildings constructed to that code. We incorporate two quantitative assessments of code stringency by others. The first is a climate adjustment to a DOE analysis that estimates a state code's overall energy usage intensity (EUI) and how it corresponds to an equivalent version of the IECC (residential) and 90.1 (commercial) (DOE 2022c). We also incorporated the New Building Institute (NBI) Zero Energy Performance Index (zEPI), which relies on the same DOE analysis; ACEEE worked with NBI to use zEPI to score building energy code stringency according to the modeled EUI.[31]

SCORING AND RESULTS

States earned credit for new construction of residential and commercial buildings on the basis of energy code stringency, stretch code adoption, energy code compliance studies, and the construction of zero-energy buildings. We also awarded points for efforts focused on existing buildings through energy usage transparency or performance standards, as well as policies to drive toward zero-energy buildings, BPS, and fuel switching of fossil fuels to electricity. Lastly, we include equity-focused credits for state policies that specifically target energy performance of low-income housing for healthy, affordable, and efficient buildings. We awarded points as follows:

- New construction and building energy codes *(6.5 points total)*

[31] The zEPI scale establishes zero-net energy as the absolute goal and enables the measurement of a building's progress toward zero-net energy performance, as opposed to the traditional percentage-better-than-code metric. It is based on methodology presented in a paper by Charles Eley (Eley 2009). To learn more about the zEPI methodology, see newbuildings.org/code_policy/zepi/.

    - Residential energy code stringency (2 points)
    - Commercial energy code (2 points)
    - Energy code compliance study (1 point)
    - (NEW) Stretch code adoption (1 point)
    - Zero-energy buildings (0.5 points)
- Existing building energy usage *(2.5 points total)*
    - Residential and/or commercial benchmarking/transparency policies (0.5 point)
    - Existing BPS (1 point)
    - (NEW) Fuel-switching enabling policies (1 point)
- Healthy, affordable and efficient buildings *(3 points total)*
    - (NEW) Minimum energy performance standards for state housing-agency-funded projects (1 point)
    - (NEW) State efforts to remediate health/safety deficiency barriers to weatherization in low-income households (1 point)
    - (NEW) Zero-energy buildings and electrification in affordable housing/construction (1 point)

A state's performance in our scoring can vary across the three categories of credits: new construction, existing buildings, and equity metrics. Table 20 summarizes the top 20 scored states and highlights how states that excel in one category may be weaker in others. Only 5 states received more than half the possible points for existing building policies, while 35 states received a total score of zero or negative. Reducing GHG emissions from today's buildings—which will still make up a majority of buildings in 2050—is critical to effective climate action, so states need to make significant improvements in existing building energy policy.

Building energy policies have traditionally emphasized new construction over existing buildings, which remains reflected in our scoring in this year's *Scorecard*. Future editions of the *State Scorecard* may shift emphasis to better balance new construction and existing buildings, recognizing the outsized role of the latter in achieving broad building decarbonization. Therefore, in the future, changes may emerge in overall building energy policy scores and the top overall states shown in table 21. For example, if new and existing building policies were weighted equally, the District of Columbia would tie Massachusetts for first overall in our rankings; currently, it ranks fourth.

Table 20. Top 20 states in each scoring credit category

New construction (6.5 points total)		Existing buildings (2.5 points total)		Equity metrics (3 points total)	
State	Score	State	Score	State	Score
1. Massachusetts	6.5	1. Colorado	2.5	1. District of Columbia	2.5

New construction (6.5 points total)		Existing buildings (2.5 points total)		Equity metrics (3 points total)	
State	Score	State	Score	State	Score
1. California	6.5	1. District of Columbia	2.5	1. Massachusetts	2.5
3. Vermont	6	3. Maryland	2	1. New York	2.5
4. Washington	5.5	4. Massachusetts	1.5	1. Maine	2.5
5. New York	5	4. California	1.5	1. New Jersey	2.5
5. Maine	5	6. Vermont	1	1. Rhode Island	2.5
5. Oregon	5	6. New York	1	7. Maryland	2
5. Connecticut	5	6. Maine	1	7. California	2
9. Colorado	4.5	6. Minnesota	1	7. Vermont	2
9. Montana	4.5	6. New Jersey	1	7. Minnesota	2
11. Maryland	4	6. Illinois	1	7. Alaska	2
11. Pennsylvania	4	6. Tennessee	1	7. Delaware	2
11. Nebraska	4	6. Alaska	1	7. North Carolina	2
11. Hawaii	4	14. Washington	0.5	7. Oregon	2
15. District of Columbia	3.5	14. Connecticut	0.5	7. Pennsylvania	2
15. Rhode Island	3.5	14. Wisconsin	0.5	7. Texas	2
15. Minnesota	3.5	*17. 24 States*	0	17. Washington	1.5
15. Texas	3.5			17. Connecticut	1.5
15. Nevada	3.5			17.Ohio	1.5
15. New Mexico	3.5			17. Indiana	1.5
15. Virginia	3.5			*20. 10 States*	1
15. Michigan	3.5				
15. West Virginia	3.5				

Table 21. State scores for building energy efficiency policies

State	Residential code stringency (2 pts.)	Commercial code stringency (2 pts.)	Code compliance study (1 pt.)	Stretch code adoption (1 pt.)	Benchmarking and transparency (0.5 pts.)	Existing building performance standards (1 pt.)	Fuel-switching enabling policies (1 pt.)	Zero-energy buildings (0.5 pts.)	Minimum energy standards for state housing agency projects (1 pt.)	Health/safety remediation efforts in affordable housing (1 pt.)	Zero-energy buildings and electrification in affordable housing (1 pt.)	Total score (12 pts.)
Massachusetts	2	2	1	1	0.5	0	1	0.5	1	1	0.5	10.5
California	2	2	1	1	0.5	0	1	0.5	1	0.5	0.5	10
Vermont	2	2	1	0.5	0	0	1	0.5	1	0.5	0.5	9
Maine	1.5	1.5	1	1	0	0	1	0	1	1	0.5	8.5
District of Columbia	1	2	0	0.5	0.5	1	1	0	1	1	0.5	8.5
New York	1.5	1.5	1	1	0	0	1	0	1	0.5	1	8.5
Maryland	1.5	1.5	0	0.5	0.5	1	0.5	0.5	1	1	0	8
Colorado	1	1.5	1	0.5	0.5	1	1	0.5	0	0.5	0.5	8
Washington	2	2	1	0	0.5	1	-1	0.5	1	0.5	0	7.5
Connecticut	2	2	1	-0.5	0	0	0.5	0.5	1	0.5	0	7
New Jersey	0.5	2	1	-0.5	0.5	0	0.5	0	1	1	0.5	6.5
Minnesota	1.5	1.5	1	-0.5	0	0	1	0	1	1	0	6.5
Rhode Island	1	2	1	-0.5	0	0	0	0	1	1	0.5	6
Oregon	1.5	2	1	0	0	0	-1	0.5	1	1	0	6
Pennsylvania	1.5	2	0.5	0	0	0	-1	0	1	1	0	5
Delaware	1.5	1.5	0	0	0	0	0	0	1	1	0	5

State	Residential code stringency (2 pts.)	Commercial code stringency (2 pts.)	Code compliance study (1 pt.)	Stretch code adoption (1 pt.)	Benchmarking and transparency (0.5 pts.)	Existing building performance standards (1 pt.)	Fuel-switching enabling policies (1 pt.)	Zero-energy buildings (0.5 pts.)	Minimum energy standards for state housing agency projects (1 pt.)	Health/safety remediation efforts in affordable housing (1 pt.)	Zero-energy buildings and electrification in affordable housing (1 pt.)	Total score (12 pts.)
Illinois	1	2	0	0	0	0	1	0	0	1	0	5
Nebraska	1.5	1.5	1	0	0	0	0	0	1	0	0	5
Texas	1	1.5	1	0	0	0	-1	0	1	1	0	4.5
North Carolina	1	1.5	0	-0.5	0	0	0	0.5	1	1	0	4.5
Nevada	1	1.5	1	0	0	0	0	0	0	1	0	4.5
New Mexico	1	1.5	1	0	0	0	0	0	1	0	0	4.5
Hawaii	1	1.5	1	0	0	0	0	0.5	0.5	0	0	4.5
Montana	1.5	2	0.5	0.5	0	0	0	0	0	0	0	4.5
Utah	0.5	1.5	1	-0.5	0	0	0	0.5	1	0	0	4
Michigan	1	2	1	-0.5	0	0	0	0	0	0.5	0	4
Virginia	1	1.5	1	-0.5	0	0	-1	0.5	0	1	0	3.5
New Hampshire	1.5	1.5	0	-0.5	0	0	0	0	0	1	0	3.5
Alaska	0	0	0	0	0	0	1	0	1	1	0	3
Indiana	1	0.5	0	0	0	0	0	0	0.5	1	0	3
Ohio	1	1	0	-0.5	0	0	0	0	0.5	1	0	3
Idaho	0.5	1.5	1	-0.5	0	0	0	0	0.5	0	0	3
Alabama	1	1.5	0.5	0	0	0	0	0	0	0	0	3

State	Residential code stringency (2 pts.)	Commercial code stringency (2 pts.)	Code compliance study (1 pt.)	Stretch code adoption (1 pt.)	Benchmarking and transparency (0.5 pts.)	Existing building performance standards (1 pt.)	Fuel-switching enabling policies (1 pt.)	Zero-energy buildings (0.5 pts.)	Minimum energy standards for state housing agency projects (1 pt.)	Health/safety remediation efforts in affordable housing (1 pt.)	Zero-energy buildings and electrification in affordable housing (1 pt.)	Total score (12 pts.)
Tennessee	0	1	1	-1	0	0	1	0	0	0.5	0	2.5
Florida	1	1.5	0	0	0	0	0	0	0	0	0	2.5
West Virginia	1	2	1	-0.5	0	0	-1	0	0	0	0	2.5
Wisconsin	0.5	1.5	0	-0.5	0	0	0.5	0.5	0	0	0	2.5
Iowa	1	1	0	0	0	0	0	0	0	0	0	2
Georgia	1	1.5	0	-0.5	0	0	0	0	0	0	0	2
Missouri	0.5	0.5	0	0	0	0	0	0	0	0.5	0	1.5
Kentucky	0	1	0	-0.5	0	0	0	0.5	0	0	0	1
South Dakota	0.5	0.5	0	0	0	0	0	0	0	0	0	1
North Dakota	0.5	0.5	0	0	0	0	0	0	0	0	0	1
Arizona	0	0	1	-0.5	0	0	-1	0	1	0	0	0.5
Kansas	0	0.5	0	0	0	0	-1	0	0	1	0	0.5
Louisiana	0.5	0.5	0	-0.5	0	0	-1	0	0	0.5	0	0
Mississippi	0	0	0	0	0	0	0	0	0	0	0	0
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0
South Carolina	0.5	0.5	0	-0.5	0	0	-1	0.5	0	0	0	0
Arkansas	0	0.5	0	0	0	0	-1	0	0	0	0	-0.5
Oklahoma	0	0	0	-0.5	0	0	-1	0	0	0.5	0	-1

DISCUSSION

ENERGY CODE STRINGENCY

To offer an objective comparison of state-level building energy codes, we use two quantitative measures of energy code stringency: zEPI and an adjusted energy index based on a DOE analysis. Both metrics use data from the Pacific Northwest National Laboratory (PNNL) to calculate expected annual EUI in kBtu per square foot by accounting for building type and distribution and regional climate zones for each state.[32] PNNL's analysis accounts both for adopted versions of the model codes and for state-specific amendments to certain sections of a code (e.g., adjusting the allowable air leakage rate or altering the amount of insulation required). Such amendments can have either a positive or negative impact, depending on whether they strengthen or weaken the affected provisions (though weakening amendments are far more common). In states that allow jurisdictions to adopt codes that are more stringent than the state minimum, many large jurisdictions opt for more recent versions of the model codes.

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.[33] We further compared states using DOE's analysis of each state's energy code stringency, which is based in the same models as used for zEPI. The DOE analysis computes an Energy Index (EI) based on a model EUI compared to a base model code (2006 IECC for residential, 90.1-2004 for commercial) and aggregated across building types, foundation types, system types, and climate zones using weighting factors based on new construction permit data. Because the EI depends on climate zone, we computed an Adjusted EI by scaling each state's EI based on the overall average EI for the most recent model code year (2021 IECC for residential, 90.1-2019 for

[32] 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. For more information, see: https://www.energycodes.gov/status.

[33] 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 24 are solely a reflection of the state's baseline building energy code.

commercial). We include this metric alongside zEPI to mitigate any negative impact of the state's climate; it generally has no impact on the scoring except in a few cases where the model codes' performance in certain climate zones deviates from the mean.

Residential and commercial building energy code stringency are scored separately. We assigned each state 0–2 points for residential and another 0–2 points for commercial. Each are scored using the following process. First, we assigned 2 points to the lowest zEPI score and 2 points to the lowest Adjusted EI; a lower zEPI score or Adjusted EI means higher efficiency. Next, we assigned 0 points to the highest zEPI score and the highest Adjusted EI. All other states were proportionally assigned points between 0 and 2 for each scoring scale. We then averaged the zEPI score points and Adjusted EI points for each state and rounded to the nearest 0.5 to assign the final score in table 21.

While only four states have thus far achieved the 2021 IECC level of residential code performance represented by a score of 2 points,[34] we believe it sets an important marker given the very significant energy efficiency improvement between the 2018 and 2021 versions and the limited efficiency gains previously achieved in the 2018 and 2015 versions. More states have earned 2 points for commercial energy codes based on a combination of the highest-level model commercial code (90.1-2019) having been out longer, steadier incremental progress in efficiency across 90.1 versions, and fewer state amendments that reduced stringency compared to the residential code.

Most home-rule states that have no mandatory state code and adopt building energy codes at the local level lack sufficient data for DOE's quantitative analysis. Currently, 10 states lack mandatory statewide energy codes for new residential and/or commercial construction (Alaska, Arizona, Colorado, Hawaii, Kansas, Mississippi, Missouri, North Dakota, South Dakota, and Wyoming). We gave some consideration to local energy code adoption in our scoring, but our ability to do so is limited by data availability. [35] Colorado is unique for a home-rule state in that it requires local jurisdictions to adopt and enforce one of the three most recent IECC versions when adopting or updating any other building code. Colorado also provides detailed data on energy codes by jurisdiction (Colorado Energy Office 2022a) that allowed us to estimate what PNNL's analysis would compute. Other home-rule states are showing high rates of adoption at the jurisdictional level that we and PNNL can also glean from public sources. For example, the two most populous cities in Arizona, Phoenix

[34] While Massachusetts's base state energy code is assessed by the DOE as just shy of the 2021 IECC level, nearly 90% of the population is covered by the state's stretch code; although we have a dedicated metric related to stretch codes (see below), we believe the particular situation in Massachusetts warrants 2 points under this credit.

[35] We have not developed a systematic quantitative method for comparing the interstate impact of jurisdictional code adoptions in home-rule states, in part because of a lack of consistent data across states.

and Tucson, have both adopted the 2018 IECC and the four most populous counties in Hawaii have adopted the 2015 IECC.[36] For detailed information on building code stringency in each state, visit ACEEE's State and Local Policy Database (ACEEE 2022b).

Table 22 shows state-by-state scores for residential and commercial energy codes stringency. In the *2020 State Scorecard*, 19 states had adopted the 2018 IECC (12 of which included weakening amendments). Since then, New Hampshire, New Jersey, and Pennsylvania have adopted the 2018 IECC, as has Nevada, but with amendments that significantly reduce stringency.[37] Only Connecticut has thus far adopted the 2021 IECC in full,[38] though many jurisdictions across the United States have done so; local code adoption beyond the state-level codes are accounted for in both the zEPI score and DOE's code stringency analysis (see table 22). Connecticut, Montana, and Oregon have adopted 90.1-2019 for commercial buildings and five other states have stringency equal to or exceeding 90.1-2019 in DOE's assessment.

[36] DOE's analysis includes estimates of code stringency in Arizona and Hawaii, based on its assessment that 82% and 86% of the population in each respective state is covered by jurisdictions that have adopted codes that can be analyzed using its methodology. See www.energycodes.gov/status for more information.

[37] Nevada adopted the 2021 IECC at the state level in 2021; however, it is currently not in force in any jurisdiction in Nevada and DOE does not consider the effect of the 2021 IECC in its analysis of state energy codes.

[38] Montana has done so with amendments that significantly weaken the code, with DOE assessing the amended code to achieve energy efficiency equivalent to the 2009 IECC.

Table 22. State scores for code stringency

Residential Energy Code Stringency					Commercial Energy Code Stringency				
State	zEPI Score	Adjusted EI	Residential Code Status	Score	State	zEPI Score	Adjusted EI	Commercial Code Status	Score
Vermont	42.5	59.1	IECC_2018 with amendments	2	California			Custom code exceeds 90.1-2019 per DOE analysis	2
California			Custom code exceeds 2021 IECC per DOE analysis	2	Massachusetts	46.5	61.0	2018 IECC and 90.1-2016^	2
Washington			Custom code exceeds 2021 IECC per DOE analysis	2	Montana	46.5	61.0	2021 IECC and 90.1-2019	2
Massachusetts	48.3	66.7	IECC_2018 with amendments	2	Vermont	46.5	61.0	2018 IECC and 90.1-2016^	2
Connecticut	48.3	65.5	IECC_2021	2	Connecticut	47.3	63.1	2021 IECC and 90.1-2019	2
Maine	49.4	69.3	IECC_2015 with amendments	1.5	New Jersey	48.0	64.1	90.1-2016	2
Minnesota	50.7	71.3	IECC_2012 with amendments	1.5	Washington	48.0	59.7	2018 Washington State Energy Code	2
Delaware	51.6	72.2	IECC_2018	1.5	Oregon	48.8	63.1	90.1-2019	2
Nebraska	52.3	71.2	IECC_2018	1.5	Pennsylvania	48.8	66.8	2018 IECC and 90.1-2016	2
New Hampshire	52.3	70.7	IECC_2018	1.5	West Virginia	48.8	67.7	90.1-2013	2
Pennsylvania	52.9	72.1	IECC_2018 with amendments	1.5	Illinois	49.5	66.1	2018 IECC and 90.1-2016	2
New York	53.8	72.3	IECC_2018	1.5	Michigan	49.5	66.1	2015 IECC and 90.1-2013^	2
Montana	53.8	72.3	IECC_2021 with amendments	1.5	Rhode Island	49.5	66.9	2018 IECC and 90.1-2016^	2
Maryland	53.9	72.8	IECC_2018 with amendments	1.5	District of Columbia	50.3	61.9	90.1-2013^	2
Oregon	56.0	70.7	IECC_2018 with amendments	1.5	Delaware	49.5	67.8	2018 IECC and 90.1-2016	1.5
Michigan	54.0	75.9	IECC_2015 with amendments	1	Maryland	50.3	66.1	2018 IECC and 90.1-2016	1.5
Iowa	54.9	76.8	IECC_2012 with amendments	1	Nebraska	50.3	67.1	2018 IECC and 90.1-2016	1.5
Nevada	55.6	74.9	IECC_2018 with amendments	1	New Hampshire	50.3	67.1	2018 IECC and 90.1-2016^	1.5
Colorado	55.8	73.9	Home rule	1	New York	51.0	65.2	2018 IECC and 90.1-2016^	1.5
Illinois	55.8	75.5	IECC_2018 with amendments	1	Alabama	51.8	69.9	90.1-2013	1.5
Ohio	56.8	78.4	IECC_2018 with amendments	1	Georgia	51.8	69.9	2015 IECC and 90.1-2013^	1.5
New Mexico	58.2	78.4	IECC_2018 with amendments	1	Idaho	51.8	68.2	2018 IECC and 90.1-2016	1.5
District of Columbia	58.8	72.9	IECC_2015 with amendments	1	Maine	51.8	69.9	2015 IECC and 90.1-2013	1.5
Indiana	58.9	81.4	IECC_2018 with amendments	1	Texas	51.8	69.9	2015 IECC and 90.1-2013	1.5
West Virginia	59.0	78.3	IECC_2015 with amendments	1	Utah	51.8	67.3	2018 IECC and 90.1-2016	1.5
Alabama	59.3	75.5	IECC_2015 with amendments	1	Virginia	51.8	68.2	2018 IECC and 90.1-2016^	1.5
Georgia	59.6	77.3	IECC_2015 with amendments	1	Florida	52.5	68.3	2018 IECC and 90.1-2016^	1.5
Rhode Island	59.9	83.8	IECC_2018 with amendments	1	Minnesota	52.5	70.0	2018 IECC and 90.1-2016^	1.5
Texas	59.9	72.4	IECC_2015	1	New Mexico	52.5	69.2	2018 IECC and 90.1-2016^	1.5
Virginia	60.4	80.1	IECC_2018 with amendments	1	Wisconsin	52.5	69.2	2015 IECC and 90.1-2013^	1.5
North Carolina	60.5	78.4	IECC_2015 with amendments	1	Nevada	53.3	68.5	2018 IECC and 90.1-2016	1.5
Florida	64.5	74.2	IECC_2018 with amendments	1	Colorado	54.6	69.5	Home rule	1.5
Hawaii	66.9	73.0	IECC_2015 with amendments	1	North Carolina	54.8	73.0	2015 IECC and 90.1-2013^	1.5
New Jersey	62.4	84.0	IECC_2018 with amendments	0.5	Hawaii			Widespread adoption exceeds 90.1-2013	1.5
Idaho	62.7	84.0	IECC_2018 with amendments	0.5	Kentucky	60.8	82.0	2012 IECC and 90.1-2010	1
Utah	65.0	85.4	IECC_2015 with amendments	0.5	Iowa	61.5	82.5	2012 IECC and 90.1-2010	1
Wisconsin	66.4	94.4	IECC_2009 with amendments	0.5	Ohio	63.0	84.4	2012 IECC and 90.1-2010	1
South Carolina	69.6	88.9	IECC_2009	0.5	Tennessee	63.0	84.0	2012 IECC and 90.1-2010	1
Louisiana	69.7	83.5	IECC_2009	0.5	Indiana	69.0	92.0	90.1-2007	0.5
Missouri			Some adoption of 2009-2018 IECC	0.5	Arkansas	69.8	93.5	2009 IECC and 90.1-2007	0.5
North Dakota			Limited local adoption beyond 2009 IECC	0.5	Louisiana	69.8	93.4	90.1-2007	0.5
South Dakota			Very limited local adoption beyond 2009 IECC	0.5	South Carolina	69.8	93.2	2009 IECC and 90.1-2007	0.5
Oklahoma	67.9	97.3	IECC_2009 with amendments	0	Kansas			Limited coverage beyond 2009 IECC	0.5
Kentucky	69.2	93.5	IECC_2009	0	Missouri			Some adoption of 2009-2018 IECC	0.5
Tennessee	70.6	93.1	IECC_2018 with amendments	0	North Dakota			Limited local adoption beyond 2009 IECC	0.5
Arkansas	72.4	97.3	IECC_2009 with amendments	0	South Dakota			Very limited local adoption beyond 2009 IECC	0.5
Alaska			No mandatory code	0	Oklahoma	79.5	105.8	2006 IECC and 90.1-2004	0
Arizona			Adoption falls short of 2009 IECC per DOE analysis	0	Alaska			No mandatory code	0
Kansas			Limited coverage beyond 2009 IECC	0	Arizona			Adoption falls short of 90.1-2007 per DOE analysis	0
Mississippi			No statewide code	0	Mississippi			No statewide code	0
Wyoming			No statewide code	0	Wyoming			No statewide code	0

^When an amendment's impact on energy efficiency could be quantified using DOE Prototype Building Models, this was captured in the zEPI analysis.

Energy Code Compliance Study

It is difficult to score states in this area because consistent data on actual compliance rates are lacking, and other compliance metrics are largely qualitative. Still, we continue to seek ways to score states in a manner that reflects meaningful efforts to increase energy savings through improved code compliance. Here, we award 1 point if a state has completed a code compliance study in the past five years (or currently has one under way) that followed standardized protocols and statistically significant sample sizes. A state can earn 0.5 points

under this credit in two ways. The first is if a state has performed a compliance study in the past five years (or has one currently under way) that does not follow standardized protocols or is not statistically significant. We alternatively award 0.5 points if a state has significant state- or utility-funded code compliance improvement programs; we use our discretion in evaluating what is "significant," so there is some subjectivity here. For more information on state compliance efforts, visit ACEEE's State and Local Policy Database (ACEEE 2022b). Table 23 shows our scoring methodology for assessing state compliance studies and the states scoring under each category.

Table 23. Scoring of state efforts to assess compliance

Compliance study	Qualifying states	Score (1 pt.)
Compliance study has been completed in the past five years (or is currently underway), follows standardized protocols, and includes a statistically significant sample.	Arizona, California, Colorado, Hawaii, Idaho, Maine, Massachusetts, Michigan, Minnesota, Nevada, New Jersey, New Mexico, Oregon, Rhode Island, Texas, Utah, Vermont, Washington	1
Compliance study has been completed in the past five years (or is currently underway) but does not follow standardized protocols or is not statistically significant. *OR* State- or utility-funded programs exist to improve energy code compliance	Alabama,* Connecticut, Montana, Pennsylvania	0.5
No compliance study has been completed in the past five years.	*All other states*	0

*** For Alabama, a follow-up to an earlier (more than five years old) statistically significant energy code compliance study was conducted in the past five years, but for only a smaller sample.**

Stretch Code Adoption

Statewide stretch codes allow local jurisdictions to easily adopt minimum energy efficiency requirements that go beyond the provisions of the base code. These have traditionally been state-specific, but IECC 2021 includes appendices that states and jurisdictions can adopt to go beyond the normative provisions of the model code. Table 24 summarizes our scoring

methodology for stretch codes, which includes both credit for stretch code availability and implementation and deductions where states prevent local jurisdictions from adopting stretch codes. As the table shows, few states have developed or adopted stretch codes to date; however, stretch codes have significant potential to drive down energy usage in new buildings and are included to benchmark states in their pursuit of this strategy.

Table 24. Scoring of state stretch code adoption

Assessment of stretch code policies	Qualifying states	Score
States with a stretch code and supporting local jurisdiction adoption	California, Maine, Massachusetts, New York	1
States with significant local adoption of energy codes beyond state minimum requirements and/or support to do so (e.g., funding or available stretch/reach codes)	Colorado, District of Columbia,* Maryland, Montana, Vermont	0.5
States without a stretch code, but with no policy barriers to jurisdictions adopting their own	*All other states*	0
States that allow jurisdictions to adopt energy codes less stringent than the statewide energy code *or* States with restrictions or policy barriers to jurisdictions adopting energy codes more stringent than the statewide energy code	Arizona, Connecticut, Georgia, Idaho, Kentucky, Louisiana, Michigan, Minnesota, New Hampshire, New Jersey, North Carolina, Ohio, Rhode Island, South Carolina, Utah, Virginia, West Virginia, Wisconsin	–0.5
States meeting both criteria for a 0.5 point reduction	Tennessee	-1

***The District of Columbia's Appendix Z provides a Net-Zero-Energy code compliance path that operates as a reach code. Because of the District of Columbia's unique situation vis-à-vis the states and the strength of Appendix Z, we have awarded 0.5 points. †Oregon has a voluntary "reach" code, but otherwise the base energy code applies statewide. While Oregon has a procedure for reviewing and approving local amendments, none in effect would apply to the stretch code credit. Though this may technically qualify Oregon for –0.5 points, we have decided to assign it zero points based on an overall assessment of its unique situation.**

Zero-Energy Buildings

The New Buildings Institute tracks verified and emerging (i.e., not yet proven but in operation) zero-energy commercial and multifamily building (ZEB) projects throughout the United States (NBI 2022). [39] For this metric, we considered only verified ZEBs and computed the total floor area of verified ZEBs for each state.[40] We then normalized the total floor area by the 2017–2021 average gross domestic product (GDP) for the construction industry in each state (BEA 2022) to account for the different amount of construction activity in each state (scaling largely, but not solely, with population). This ZEB rating is then compared across states.

Our scoring results in table 25 show South Carolina to have the highest ZEB rating—driven entirely by five zero-energy schools in Myrtle Beach. California comes in second, but is the faraway leader in total number of verified ZEBs and square footage (with its ZEB rating mitigated by its sheer size and construction activity). Most states have at least one ZEB, and there is no clear threshold at which credits should be awarded here. We awarded 0.5 points to states that achieved a ZEB rating of 5 or above, which includes about one-third of all states, as table 25 shows.

Table 25. Zero-energy buildings scoring

State	Verified ZEBs	Verified ZEB floor area (1,000 sf)	Construction industry GDP ($ billions)	ZEB rating	Score
South Carolina	5	783	9.7	80.7	0.5
California	52	4284	94.0	45.6	0.5
Kentucky	3	231	6.4	36.2	0.5
Vermont	4	30	0.9	32.3	0.5
North Carolina	5	390	19.7	19.8	0.5
Utah	2	170	10.5	16.2	0.5
Colorado	2	238	18.0	13.2	0.5

[39] Emerging projects are those that have not yet achieved zero-energy status, or those for which NBI does not have data to verify zero-energy performance (NBI 2022).

[40] In the *2020 State Scorecard*, we weighted emerging ZEBs by 0.5; however, the growth in the number of verified ZEBs in the past two years represents only 6% of the emerging ZEBs of 2020, so we have decided to only award proven ZEBs here.

State	Verified ZEBs	Verified ZEB floor area (1,000 sf)	Construction industry GDP ($ billions)	ZEB rating	Score
Maryland	3	246	19.3	12.7	0.5
Wisconsin	2	138	11.1	12.5	0.5
Virginia	5	225	19.3	11.6	0.5
Oregon	8	94	8.9	10.6	0.5
Connecticut	3	54	6.0	9.0	0.5
Washington	7	151	20.1	7.5	0.5
Massachusetts	7	131	17.6	7.4	0.5
Hawaii	3	27	4.2	6.4	0.5
Illinois	3	106	23.8	4.4	0
Maine	1	8	1.8	4.4	0
Idaho	1	15	3.4	4.3	0
Iowa	2	27	6.7	4.0	0
Arkansas	1	13	3.9	3.4	0
Ohio	3	55	20.5	2.7	0
Pennsylvania	5	58	24.4	2.4	0
New York	6	96	42.8	2.2	0
Delaware	1	3	2.2	1.4	0
New Jersey	1	20	17.1	1.2	0
Arizona	1	17	14.4	1.1	0
Minnesota	2	15	13.7	1.1	0
Florida	7	52	47.3	1.1	0
Indiana	3	11	13.3	0.8	0
Nevada	2	7	9.9	0.7	0
Texas	3	47	71.0	0.7	0
Michigan	1	9	15.2	0.6	0
Missouri	1	3	11.1	0.3	0
All others	0	0	—	0.0	0

Benchmarking and Energy Transparency Requirements

While several states have taken the lead in requiring benchmarking and energy use transparency, this year's *Scorecard* has scaled back the points awarded here. Energy transparency policy requirements, building types covered, and minimum applicable square footage vary across states. This credit is assigned 0.5 points in this year's *Scorecard*, so differences in such policies are not captured in the scoring, but table 26 summarizes both the state policies and the scoring. All states with mandatory energy use benchmarking and transparency laws applying to privately owned buildings received 0.5 points; we have awarded points where benchmarking and transparency laws have passed, even if the first benchmarking period is later than the publication of this report. One increasingly common transparency measure that is not awarded points here (but is found in our policy database) is requiring home sellers to disclose energy usage to would-be buyers or at the time of sale.

Table 26. State benchmarking and energy transparency policies*

State	Disclosure type	Building energy use transparency requirements	Score (0.5 pts.)
California	Commercial, multifamily residential	AB 1103 required nonresidential building owners or operators to benchmark their buildings' energy use with ENERGY STAR Portfolio Manager and to disclose this information to buyers, lenders, and lessees. AB 802 replaces this legislation and expands the requirement to any building with five or more active utility accounts, including residential multifamily buildings.	0.5
Colorado	Commercial, multifamily residential	The Energy Performance for Buildings Statute (HB 21-1286) requires owners of large commercial, multifamily, and public buildings 50,000 square feet or greater to annually report their whole-building energy use to the Colorado Energy Office beginning December 1, 2022, and annually by June 1 thereafter.	0.5
District of Columbia	Commercial, multifamily	The Clean and Affordable Energy Act of 2008 requires privately owned commercial	0.5

State	Disclosure type	Building energy use transparency requirements	Score (0.5 pts.)
	residential	buildings to be benchmarked annually using ENERGY STAR Portfolio Manager. Results are publicly available in the BuildSmart DC database. The Clean Energy DC Omnibus Amendment Act of 2018 lowered the building floor area threshold and set new requirements for third-party verification every three years.	
Maryland	Commercial, multifamily residential	Maryland's building performance standard law (Chapter 38 of the Acts of the Maryland General Assembly of 2022) requires that commercial, multifamily residential and state-owned buildings greater than 35,000 square feet measure and report direct emissions to the Department of the Environment beginning in 2025.	0.5
Massachusetts	All large buildings	The Act Driving Clean Energy and Offshore Wind of 2022 requires disclosure of electricity and fuel use for buildings greater than 20,000 square feet starting in 2024. The floor area threshold may be reduced through future regulation by the Department of Energy Resources.	0.5
New Jersey	Commercial	The Clean Energy Act of 2018 requires benchmarking of energy and water data by owners and operators of commercial buildings over 25,000 sq. ft. using EPA Portfolio Manager, beginning with 2022 data.	0.5

State	Disclosure type	Building energy use transparency requirements	Score (0.5 pts.)
Washington	Commercial	SB 5854 (2009–10) requires owners of nonresidential buildings larger than 10,000 square feet and qualifying public agency buildings to benchmark their buildings' energy use with ENERGY STAR Portfolio Manager and to disclose this information to buyers, lenders, and lessees.	0.5

***Policy information is based on responses to data requests from state energy offices**

Existing Building Performance Standards

The new building energy codes described above address efficiency in new construction. However, the climate imperative—and the fact that today's buildings will account for the majority of building energy usage for decades to come—have motivated cities and states to set their sights on existing buildings. A BPS sets a ceiling on a building's annual energy usage or associated GHG emissions and ratchets down this limit over time. Buildings that exceed the limit generally must pay a penalty, though the structure of that penalty varies. A BPS typically applies only to large commercial and multifamily buildings, but states and jurisdictions are exploring approaches for other buildings. These mandatory standards promote energy efficiency retrofits by requiring existing buildings to meet a performance benchmark.

Though more common among cities, interest in these standards is also growing among states. While no states yet have a fully operational BPS, three states and the District of Columbia have passed BPS legislation. As we now describe, each of these efforts is in various stages of implementation, earning 1 point under this credit.

Washington was the first state to pass legislation establishing a statewide BPS in 2019. The BPS applies to commercial buildings larger than 50,000 square feet and sets targets equivalent to 15% less than 2009–2018 average energy usage intensity (EUI). BPS rules were finalized at the end of 2020; mandatory compliance begins in 2026, and an early adopter incentive program started in July 2021. A bill signed on March 25, 2022 expands the BPS to buildings greater than 20,000 square feet and includes multifamily buildings; benchmarking is to begin in 2027 with mandatory rules taking effect in 2031 (Washington State Department of Commerce 2022).

Colorado passed a BPS bill in 2021 that put it on a path to be the second state to adopt such a standard. HB 1286 requires annual energy reporting for Colorado's large buildings (over 50,000 square feet) and development of a performance standard to reduce GHG

emissions from these structures 20% by 2030 relative to 2021 levels (Colorado General Assembly 2021).[41] The state energy office convened a task force in September 2021 to develop recommendations for this standard which are to be finalized by June 1, 2023 (Colorado Energy Office 2022b).

Maryland became the third state to pass a statewide BPS in 2022. The law is unique in that it applies only to "direct GHG emissions"—that is, emissions produced on-site and not from electricity generation. It applies to buildings greater than 35,000 square feet and directs the Department of the Environment to develop performance standards to achieve a 20% reduction in direct GHG emissions between 2025 and 2030, with a net-zero direct GHG emissions target before 2040 (Maryland General Assembly 2022).

Additionally, **the District of Columbia** created a BPS in 2018, with a task force recommending rules and establishing limits for Source EUI by building type. The first BPS compliance cycle ends December 31, 2026 (District of Columbia Department of Energy and Environment 2022). The District of Columbia's Affordable Housing Retrofit Accelerator is also offering technical and financial assistance for affordable multifamily buildings to meet BPS performance requirements (DCSEU 2022).

State Policies to Enable Beneficial Electrification through Fuel Switching

Efficient electric space heating, water heating, and cooking—all supplied by an increasingly low-carbon electric grid—is the most widely applicable approach to achieve the deep emissions reductions needed from building end uses that currently rely on fossil fuels. Given the opportunity that fuel switching creates to cost effectively reduce emissions, many states are increasingly motivated to update policies to enable beneficial electrification. However, other states have enacted legislation that explicitly prohibits state energy programs or local jurisdictions from encouraging fuel switching. This metric recognizes those states that have adopted specific legislation or utility regulations that enable use of energy efficiency funds to incentivize beneficial electrification measures by removing fuel-switching restrictions,

[41]Cities that have adopted such requirements include New York City; Boulder, Colorado; and St. Louis; along with the District of Columbia. 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.

realigning savings goals around fuel-neutral or carbon savings targets, and updating EM&V practices to account for the full set of benefits of these types of measures.

Table 27 summarizes and scores states on the status and types of fuel-switching rules currently in place. For additional state-specific policy details and references, please see ACEEE's policy brief, *State Policies and Rules to Enable Beneficial Electrification* (Berg 2022).

Table 27. Scoring of state fuel-switching policies

Fuel-switching policy status	Qualifying states	Score
Energy-efficient fuel switching or fuel substitution is incentivized or encouraged through clear utility regulations/guidelines or fuel neutral goals for use of efficiency funding	Alaska, California, Colorado, District of Columbia, Illinois, Maine, Massachusetts, Minnesota, New York, Tennessee, Vermont	1
Supportive policies in place, with additional specific guidance/rules pending	Connecticut, Maryland, New Jersey, Wisconsin	0.5
No fuel-switching or substitution policy or programs	*All other states**	0
Use of efficiency funds for fuel switching or substitution prohibited or discouraged	Arizona, Arkansas, Kansas, Louisiana, Oklahoma,^ Oregon, Pennsylvania, South Carolina, Texas,† Virginia, Washington, West Virginia	–1

***Utilities or program administrators have received approval in certain cases in Alabama, Delaware, Georgia, Michigan, New Hampshire, and Rhode Island. ^Oklahoma has an exception that allows for switching from electric to natural gas. †Texas has an exception for high-efficiency combined heating and air-conditioning systems.**

Minimum Energy Performance Standards for State Housing-Agency-Funded Projects

State housing finance agencies (HFAs) sometimes set energy efficiency goals for the projects they fund, which are generally inhabited by low-income households. In this new metric, we award 1 point to states with significant minimum energy performance standards for HFA-funded new construction and rehabilitation projects, such as a minimum Home Energy Rating System (HERS) score threshold[42] or another performance-based certification (e.g.,

[42] The Home Energy Rating System (HERS) Index is an energy performance scoring framework developed by Residential Energy Services Network (RESNET). It has been in use since 2006 and is a common comparison

ENERGY STAR whole-building standards and green building rating systems with strong energy efficiency requirements). We also considered similar state-specific standards that we determined to meet or exceed IECC 2018, as well as states with residential energy codes at this level according to DOE's analysis (DOE 2022c). One-half point is given for states with affordable housing-specific standards that do not meet this criteria but that do exceed the state's residential energy code. Table 28 summarizes the relevant information and point allocation.

Nine states received a full point for HERS or ENERGY STAR standards. Seven additional states have strong enough base energy code requirements to satisfy our criteria. In addition, Maine requires compliance with the 2021 IECC for state housing-agency-funded projects, and Alaska Housing and Finance Corporation requires adherence to its Building Energy Efficiency Standard (BEES), approximately equivalent to the 2018 IECC. An additional four states received 1 point for other or state-specific standards that we deemed to meet similar energy performance levels. Three states were award 0.5 points for less stringent energy efficiency requirements.

Table 28. Energy performance standards for state housing-agency-funded projects

State	HERS score requirement	ENERGY STAR whole-building performance requirements	Threshold IECC code year	Other minimum requirement	% Improvement required for rehabilitation	Score
Alaska			2018 IECC	AFHC Building Energy Efficiency Standard		1
Arizona	65 HERS score				15% HERS score reduction for rehab projects	1

measure for residential energy performance, including by the Department of Energy for certain certification purposes (RESNET 2022).

State	HERS score requirement	ENERGY STAR whole-building performance requirements	Threshold IECC code year	Other minimum requirement	% Improvement required for rehabilitation	Score
California				CALGreen Codes (reference CEC 2019 standards)		1
Connecticut	70 HERS (rehab); 42–50 HERS, depending on tier (new constr.)			CHFA Standards and Guidelines, coordination with EnergizeCT	15–35% depending on tier	1
Delaware			2018 IECC			1
District of Columbia			2018 IECC			1
Maine			2021 IECC			1
Maryland		Energy Star New Homes or Energy Star Multifamily New Construction			15% reduction for rehab projects	1
Massachusetts			2018 IECC			1
Minnesota				Enterprise Green Communities Certification, with MN overlay		1
Nebraska			2018 IECC			1
New Jersey		ENERGY STAR certification for new construction			ASHRAE Level 2 Audit with targeted 15% savings	1

State	HERS score requirement	ENERGY STAR whole-building performance requirements	Threshold IECC code year	Other minimum requirement	% Improvement required for rehabilitation	Score
New Mexico	65 HERS (rehab), 55 HERS for new construction					1
New York		ENERGY STAR Certified Homes, Multifamily High Rise program, or Multifamily New Construction		Projects must participate in one of the following: NYSERDA programs, EPA ENERGY STAR programs, Enterprise Green Communities Criteria, or other strategies for rehabilitation projects		1
North Carolina		ENERGY STAR Multifamily New Construction Program certification				1
Ohio		ENERGY STAR Multifamily New Construction Program certification		Enterprise Green Communities, LEED*, or National Green Building Standard certification		1

State	HERS score requirement	ENERGY STAR whole-building performance requirements	Threshold IECC code year	Other minimum requirement	% Improvement required for rehabilitation	Score
Oregon			2018 IECC	Oregon State Energy Code + solar-ready multifamily		1
Pennsylvania				Must pursue 1 of several certifications with EE requirements		1
Rhode Island				NGRID RNC* Tier I Standard	15–25% reduction for Tier I Standard	1
Texas			2018 IECC			1
Utah		ENERGY STAR Multifamily New Construction Program certification				1
Vermont				Efficiency Vermont's High-Performance Track standard		1
Washington				Evergreen Sustainable Development Standard		1
Hawaii			2015 IECC			0.5
Idaho				LIHTC* program green building threshold requirement		0.5

State	HERS score requirement	ENERGY STAR whole-building performance requirements	Threshold IECC code year	Other minimum requirement	% Improvement required for rehabilitation	Score
Indiana				Minimum Development Standards of the 2022 Qualified Allocation Plan		0.5
All other states						0

Source: Data from survey of state energy offices, survey of state housing finance agencies, and ACEEE research of publicly available data. * LEED = Leadership in Energy and Environmental Design. NGRID RNC = National Grid Residential New Construction. LIHTC = Low Income Housing Tax Credits.

State Efforts to Remediate Health/Safety Deficiency Barriers to Weatherization in Low-Income Households

DOE's WAP funds energy efficiency improvements in low-income households and is administered by the states. However, a home's health and safety issues can render it ineligible for WAP funding. Several states have programs to address these barriers, often referred to as "Pre-WAP" programs. Because inefficient homes of low-income families often have other, nonenergy-related issues, such programs can help ensure that households that would benefit most from weatherization are eligible for such support. This new metric assesses states' efforts to remediate issues that could prevent low-income households from accessing funding through weatherization programs. Only state-sponsored programs are evaluated here; local government and utility programs may be available in some locations.

States operating a program specifically designed to remediate health, safety, and other barriers to WAP funding receive 1 point. Absent such a program, states that formally coordinate similar goals with other state programs providing healthy homes services receive 0.5 points. Table 29 describes targeted state programs and coordination with other programs, as well as the point allocation for each state under this metric. Twenty states have a designated program to address residential health and safety repairs. Vermont is developing such a program and is awarded 0.5 points for that effort. Ten other states have alternative programs that address some of the barriers addressed by Pre-WAP or coordinate with other programs to achieve similar goals.

Table 29. State programs and investments to remediate health and safety barriers to weatherization in low-income households

State	Brief description	Score
Alaska	Tribal Air and Healthy Homes Program	1
Delaware	Lead-Free Healthy Homes Program (HFA, Division of Public Health); Pre-WAP program (DESEU, state WAP office)	1
District of Columbia	Single Family Residential Rehabilitation Program (roof repairs and accessibility); Safe At Home program (trip-and-fall and preventative adaptations); other DHCD-funded CBOs	1
Indiana	Pre-WAP (State WAP office)	1
Illinois	Climate and Equitable Jobs Act requires utilities to invest in health and safety improvements for weatherization	1
Kansas	Residential Lead Hazard Prevention Program; Kansas Healthy Homes Program	1
Maine	Home Repair Program	1
Maryland	Maryland Housing Rehabilitation Program; Indoor Plumbing Program; Accessible Homes for Seniors Program; both HSI programs (Lead Hazard Reduction and Healthy Homes for Healthy Kids)	1
Massachusetts	Mass Save low-income program barrier mitigation funding	1
Minnesota	Lead-related HSI Healthy AIR (Asbestos Insulation Removal) account and pre-weatherization funding set up by the Eco Act The Energy Conservation & Optimization Act of 2021 allows preweatherization measures for inclusion in energy efficiency low-income programs. Up to 15% of a utility's spending on energy efficiency low-income programs may be spent on pre-weatherization measures.	1
Nevada	Nevada Healthy Homes Program	1
New Hampshire	Lead and Healthy Homes Program	1
New Jersey	Hospital Partnership Subsidy Program Whole House Pilot Program	1
North Carolina	Essential Single-Family Rehabilitation Program	1
Ohio	Pre-WAP funded by LIHEAP	1
Oregon	Healthy Homes Program	1

State	Brief description	Score
Pennsylvania	Pre-WAP funded by LIHEAP	1
Rhode Island	RIHousing's Lead Safe Homes Program	1
Texas	Amy Young Barrier Removal Program (grant to remove hazardous conditions and increase accessibility)	1
Virginia	Emergency Home and Accessibility Repair Program; Indoor Plumbing Rehabilitation	1
California	Several programs related to improving health conditions in homes, but no dedicated program to remediate health, safety, and other barriers to weatherization program	0.5
Colorado	Colorado's WAP and Xcel Energy's Demand-Side Management program have funds for use in minor health and safety repairs	0.5
Connecticut	Initial allocation of funding under Weatherization Barrier Remediation Program for income-eligible homes	0.5
Louisiana	HUD-funded Lead Hazard Control & Healthy Homes Program	0.5
Michigan	Lead-related Health Services Initiative (HSI)	0.5
Missouri	Lead-related HIS	0.5
New York	NYSERDA Value-Based Payment Healthy Homes Pilot	0.5
Oklahoma	Childhood Lead Poisoning Prevention Program (state health dept.)	0.5
Tennessee	Tennessee Valley Authority (TVA) Home Uplift	0.5
Vermont	Weatherization + Health Initiative (WHI) in development	0.5
Washington	Wx + Health Initiative	0.5
All other states	None identified	0

Zero-Energy Buildings and Electrification in Affordable Housing/Construction

Universal programs targeting deep energy and emissions reductions from buildings could create new inequities given structural barriers that may prevent low-income households from accessing such programs and thereby steer investment toward well-resourced households. In this new metric, we evaluate state programs that specifically target affordable housing for zero-energy buildings and electrification.

Our research indicates that eight states have zero-energy home incentive programs and that these are utilized by affordable housing developers, particularly for multifamily housing (Nadel 2020). However, currently only two states (New Jersey and New York) and District of

Columbia have broad programs with specific incentives for low-income households. Vermont offers a significant additional incentive for low-income households as part of its modular home program; although this is narrowly focused, we are awarding Vermont 0.5 points in this category as it is the largest low-income-specific subsidy across all three states' programs. Rhode Island has a pilot program that, if made permanent, could represent the leading edge for such programs. District of Columbia's Low-Income Decarbonization Program includes a broad set of measures on a path toward zero-energy homes for low-income households, including electrification. In addition, five states currently have affordable housing-focused electrification programs: California, Colorado, Maine, Massachusetts, and New York.

Here, we award 0.5 points each for the zero-energy affordable housing and low-income household electrification programs noted above; we are awarding Rhode Island 0.5 points total because its program is in the pilot stage. Policy and program developments around zero-energy homes and electrification in affordable housing are rapidly evolving. We anticipate significant growth in this area over the next couple of years and expect to report that in the next *State Scorecard*. Given that existing program support specifically for low-income households is quite modest, future versions of the *State Scorecard* are likely to require a significant leap to achieve credits under this metric. Table 30 shows scores for this metric.

Table 30. Zero-energy buildings and electrification in affordable housing

State	Zero-energy home program	Electrification program	Score
New York	NYSERDA Low-Rise Residential New Construction, Tier 3	Resilient Retrofit Program	1
District of Columbia	DCSEU's Low-Income Decarbonization Program: fuel switching to electric end uses for heating, ventilation, and air-conditioning (HVAC) and cooking; solar photovoltaic installation		1
California		Affordable Housing and Sustainable Communities Program	0.5

State	Zero-energy home program	Electrification program	Score
Colorado		Super Notice of Funding Availability (NOFA) recognizes and incentivizes projects that achieve near or full electrification	0.5
Maine		MaineHousing Heat Pump Program	0.5
Massachusetts		Several pilot and targeted programs for electrification in affordable housing (including modular homes)	0.5
New Jersey	New Jersey Clean Energy Program—Zero-Energy Ready Homes and Zero-Energy Ready Homes + RE		0.5
Rhode Island	(Pilot) Zero Energy for the Ocean State (ZEOS) Program		0.5
Vermont	Efficiency Vermont Zero Energy Modular Home program		0.5
All other states			0

In addition to those states awarded points here, several others are beginning to incorporate specific policies directed at affordable housing into existing electrification and net-zero building programs. We highlight those policies here and will continue to monitor their development in the coming years:

- Delaware offers low-interest loans and affordable home consulting as part of its Zero Energy Modular homes program.
- Hawaii's Kaupuni Village is the first net-zero-energy affordable housing community in the state, potentially providing a model for future development.

- Maryland's Energy Efficient-Homes Construction Loan program (also known as the Net Zero program) does not specifically target low-income households, but the state reports that the majority of funding has gone to projects that address the low-income sector.
- New Mexico's Sustainable Buildings Tax Credit Program provides bonuses for a fully electric house and for meeting net-zero carbon, energy, or water certification. Additional credits tied to electric end use equipment in affordable housing are available.
- Oregon Department of Energy's Energy Efficient Wildfire Rebuilding Incentive incentivizes electric heating and cooling and features higher incentive rates for low-income customers.
- Wisconsin's Focus on Energy Program offers enhanced renewable energy incentives for Affordable Housing New Construction.

This increasing focus on ensuring that low-income households are included in leading edge building energy and emissions reduction programs is a hopeful sign that future *State Scorecards* will document new and more widely established programs under this credit.

Chapter 5. State-Government-Led Initiatives

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INTRODUCTION

State legislatures and governors can advance energy efficiency policies and programs that affect the utilities, transportation, buildings, and industry sectors discussed in other chapters. They can also do more. In this chapter, we focus on energy efficiency initiatives that are designed, funded, and implemented by state entities, including energy offices, economic development agencies, and general services agencies.

In previous *Scorecards*, we have focused on three initiatives commonly undertaken by state governments: financial incentive programs for consumers, businesses, and industry; lead-by-example policies and programs to improve the energy efficiency of public facilities and fleets; and carbon pricing. This year, we included a few new metrics to add a focus on equity as well. To accommodate these new metrics, we decreased the number of points for financial incentives and removed metrics associated with the lead-by-example and carbon pricing sections. We also added a metric on whether a state has a statewide emissions reduction goal. These changes are discussed in greater detail in the following sections.

SCORING AND RESULTS

States could earn up to 4.5 points in this policy area for the following:

- Financial incentives offered by state agencies (1 point)
- Lead-by-example policies (1 point)
- Carbon pricing policy (0.5 points)
- (NEW) Dedication of carbon pricing revenues to energy efficiency equity initiatives (0.5 points)
- (NEW) Statewide emissions reduction goal (0.5 point)
- (NEW) Statewide energy burden reduction goal (0.5 point)
- (NEW) Equity task force or dedicated staff for equity concerns (0.5 point)

Table 31 presents the overall results of scoring on state initiatives.

Table 31. Summary of scores for government-led initiatives

State	Financial incentives (1 pt.)	Lead by example (1 pt.)	Carbon and climate action (1 pt.)	State government and equity (1.5 pts.)	Total score (4.5 pts.)
California	1	1	1	1.5	4.5
Maine	1	1	1	1.5	4.5
Massachusetts	1	1	1	1.5	4.5

State	Financial incentives (1 pt.)	Lead by example (1 pt.)	Carbon and climate action (1 pt.)	State government and equity (1.5 pts.)	Total score (4.5 pts.)
New York	1	1	1	1.5	4.5
Oregon	1	1	1	1.5	4.5
Rhode Island	1	1	1	1.5	4.5
Connecticut	1	1	1	1	4
Maryland	1	1	1	1	4
Vermont	1	1	1	1	4
Virginia	1	0.5	0.5	1.5	3.5
Colorado	1	1	0.5	0.5	3
Delaware	1	1	1	0	3
District of Columbia	1	1	0.5	0.5	3
Illinois	1	1	0	1	3
Minnesota	1	1	0.5	0.5	3
New Hampshire	1	1	1	0	3
New Mexico	1	1	0.5	0.5	3
New Jersey	0.5	1	1	0.5	3
Pennsylvania	1	1	1	0	3
Washington	1	1	0.5	0.5	3
Louisiana	1	1	0.5	0	2.5
Michigan	1	0	0.5	1	2.5
North Carolina	1	1	0.5	0	2.5
Arizona	1	0.5	0.5	0	2
Florida	1	0.5	0.5	0	2
Hawaii	0.5	1	0.5	0	2
Tennessee	1	1	0	0	2
Texas	1	1	0	0	2
Utah	1	1	0	0	2
Alabama	1	0.5	0	0	1.5
Arkansas	1	0.5	0	0	1.5

State	Financial incentives (1 pt.)	Lead by example (1 pt.)	Carbon and climate action (1 pt.)	State government and equity (1.5 pts.)	Total score (4.5 pts.)
Indiana	1	0.5	0	0	1.5
Kentucky	1	0.5	0	0	1.5
Mississippi	1	0.5	0	0	1.5
Montana	1	0.5	0	0	1.5
Nevada	1	0	0.5	0	1.5
South Carolina	1	0.5	0	0	1.5
West Virginia	1	0.5	0	0	1.5
Missouri	1	0.5	0	0	1.5
Alaska	1	0	0	0	1
Idaho	1	0	0	0	1
Nebraska	1	0	0	0	1
North Dakota	1	0	0	0	1
Ohio	1	0	0	0	1
Oklahoma	0.5	0.5	0	0	1
Wisconsin	1	0	0	0	1
Wyoming	1	0	0	0	1
Georgia	0.5	0	0	0	0.5
Iowa	0.5	0	0	0	0.5
Kansas	0	0.5	0	0	0.5
South Dakota	0	0	0	0	0

DISCUSSION

Financial Incentives

While utilities offer ratepayer-funded energy efficiency programs, many states also provide financial incentives to spur the adoption of technologies and practices in homes and businesses. These incentives can be administered by various state agencies but are most often coordinated by state energy offices. Incentives can take many forms: rebates, loans, grants, or bonds for energy efficiency improvements; income tax credits and deductions for individuals or businesses; and sales tax exemptions or reductions for eligible products.

Financial incentives can lower the up-front cost and shorten the payback period for energy efficiency upgrades, shrinking two barriers for consumers and businesses seeking to make cost-effective efficiency investments. Incentives also raise consumer awareness of eligible products, encouraging manufacturers and retailers to market these products more actively and to continue to innovate. As economies of scale improve, prices of energy-efficient products fall, enabling the products to eventually compete in the marketplace without the incentives.

SCORES FOR FINANCIAL INCENTIVES

We gathered information about state incentives for energy efficiency improvements through our survey of state energy officials.

We did not give points in this category for utilities' customer-funded financial incentive programs, which are covered in Chapter 2. In this chapter, we included state appropriations or bonds, oil overcharge revenues, auction proceeds from the RGGI or California's cap-and-trade program, other non-customer sources, and tax incentives. While state and customer funding sometimes overlap—for example, where state incentives are funded through a system benefits charge—we designed this category to capture energy efficiency initiatives not already captured in Chapter 2.

We also recognized growing state efforts to leverage private dollars for energy efficiency programs by awarding points for loans offered by green banks with active energy efficiency programs, and by giving credit for PACE financing programs enabled by state legislation. From 2009 to 2020, energy efficiency projects accounted for 49% of commercial PACE funding (PACENation 2022a). State legislatures pass and amend legislation enabling residential or commercial PACE, and localities or private program administrators typically run the programs, depending on the jurisdiction.[43] Sometimes states play a more prominent role in PACE coordination by administering a statewide program or offering guidance to PACE providers (Fazeli 2016). Because programs are usually locally administered, we did not give extra credit for multiple active PACE programs. We indicate in table 32 whether state PACE activity is in the residential or commercial market or both. We discuss other energy efficiency financing efforts in more detail at the end of this chapter.

States earned up to 1 point for major financial incentive programs that encourage the purchase of energy-efficient products.[44] We judged these programs on their relative

[43] Currently, 38 states and the District of Columbia authorize PACE (PACENation 2022b). While most states' PACE activity is in the commercial market, residential PACE is currently offered in California, Florida, and Missouri.

[44] Energy-efficient products include any product or process that reduces energy consumption. While renewable energy technologies such as solar hot-water heating may reduce energy consumption, they are often rolled into

strength, customer reach, and impact. Incentive programs received 0.5 points each, and states that have at least one active PACE program also earned 0.5 points. Table 32 shows our scoring of state financial incentives.

It is important to note that the number of financial incentive programs a state implements may not fully reflect the robustness of its efforts. Accordingly, we continued to ask for additional information from state energy offices regarding state budgets for financial incentives, program participation rates, verified savings from incentives, and leveraging of private capital. Appendix J presents these data.

Table 32. State scores for major financial incentive programs

State	Major state financial incentives for energy efficiency	Score (1 pt.)
Alabama	Alabama SAVES revolving loan program; EE Retrofit program; one grant and one loan; commercial PACE financing	1
Alaska	Five loan programs; two grant programs; commercial PACE financing	1
Arizona	Property tax exemption for energy-efficient building components and combined heat and power	1
Arkansas	Three loans; commercial PACE financing	1
California	California Infrastructure and Economic Development Bank–led bond program for public buildings; several grants; two revolving loans for public buildings; one loan loss reserve for small businesses; one rebate program; one tax incentive for advanced transportation technologies; commercial and residential PACE financing	1
Colorado	Loan loss reserve program; school loan program; Residential Energy Upgrade (RENU) Loan program; Agricultural Energy Efficiency Program; commercial PACE financing	1
Connecticut	Connecticut Green Bank, several loans, two financing options, three grants, commercial PACE financing	1
Delaware	Four loan programs; two grant programs; two rebate programs	1
District of Columbia	Green Light Grant Program; commercial PACE financing; DC Green Bank	1

larger programs that focus on renewable energy rather than energy efficiency. ACEEE would like to credit states for renewable energy technologies that reduce energy consumption, but they are often difficult to distinguish from broader renewable energy incentives that fall outside the scope of the *State Scorecard*. As a result, we do not credit them at this time.

State	Major state financial incentives for energy efficiency	Score (1 pt.)
Florida	Efficiency and Renewable Improvements in Commercial Aquaculture (ERICA); RESTORE Act; commercial and residential PACE financing	1
Idaho	Income tax deduction for energy efficiency improvements; one major low-interest loan program; Government Leading by Example (GLBE) program for public buildings in rural cities and counties	1
Illinois	Renewable Energy and Energy Efficiency Project Financing; Green Energy Loan program; commercial PACE financing	1
Indiana	Green Project Reserve revolving loan fund; Guaranteed Energy Savings Contract	1
Kentucky	Grants, loans, and bonds for farms, schools, and local governments; Kentucky Green Bank funded loan for state government; sales tax exemption for energy-efficient products; commercial PACE financing	1
Louisiana	Home Energy Loan Program (HELP); Energy Fund Loan Program	1
Maine	Residential rebate and incentive; consumer products incentive; commercial and industrial incentive; heat pump incentive; weatherization program	1
Maryland	Loans and grant programs for agricultural, residential, multifamily, commercial, and industrial sectors; Smart Energy Communities program; loans for state agencies; commercial PACE financing	1
Massachusetts	Alternative Energy and Energy Conservation Patent Exemption (personal and corporate); one bond; several other grants; commercial PACE financing	1
Michigan	Several grants; commercial PACE financing	1
Minnesota	Four loans; three revolving loans; commercial PACE financing	1
Mississippi	One loan program; one public-sector lease program for energy-efficient equipment; one private-sector grant for industrial energy efficiency	1
Missouri	One loan loss reserve; one revolving loan; commercial and residential PACE financing	1
Montana	Energy conservation installation tax credit; tax deduction for energy-conserving investment; Alternative Energy Revolving Loan Program; commercial PACE financing	1
Nebraska	Major loan program (Dollar and Energy Saving Loans); commercial PACE financing	1
Nevada	Property tax abatement for green buildings; Home Energy Retrofit Opportunities for Seniors (HEROS); loans for state employees; commercial PACE financing	1

State	Major state financial incentives for energy efficiency	Score (1 pt.)
New Hampshire	One revolving loan fund; one grant; commercial PACE financing	1
New Mexico	Sustainable Building Tax Credit (corporate and personal); bond program; grant program	1
New York	Green Jobs–Green NY Program; loan, grant, financing, rebate, and incentive programs; Energy Conservation Improvements Property Tax Exemption; NY Green Bank; commercial PACE financing	1
North Carolina	One loan program; one cost savings program; PACE financing	1
North Dakota	Energy Conservation Grant; State Energy Program grant	1
Ohio	Two loans and one grant program; property tax exemption for energy-efficient projects; commercial PACE financing	1
Oregon	Three grant programs; one rebate; commercial PACE financing	1
Pennsylvania	Alternative and Clean Energy Program; Sustainable Energy Finance Program; several grant and loan programs; commercial PACE financing	1
Rhode Island	Rhode Island Infrastructure Bank–led programs, including one revolving loan program and commercial PACE financing; three grants; two rebates	1
South Carolina	Tax credits and sales tax cap for new energy-efficient manufactured homes; two loan programs; mini-grants	1
Tennessee	Energy Efficient Schools Initiative (loans and grants); six grant programs; one loan program	1
Texas	Major loan program (Texas LoanSTAR); commercial PACE financing	1
Utah	Two loan programs for state-owned buildings and schools; commercial PACE financing	1
Vermont	Three Sustainable Energy Loan Fund programs; Energy Loan Guarantee Program; Weatherization Trust Fund; Heat Saver Loan	1
Virginia	One loan program; personal tax incentive; commercial PACE financing	1
Washington	Major grant program for energy efficiency in public facilities and local communities; several loans and grants; commercial PACE financing	1
West Virginia	West Virginia Division of Energy and West Virginia University College of Engineering partnership; EE West Virginia; one mini grant fund	1
Wisconsin	Energy Innovation Grant Program; commercial PACE financing	1
Wyoming	Three grant programs; one loan program	1
Georgia	Commercial PACE financing	0.5
Hawaii	Green Energy Market Securitization (GEMS) financing program	0.5

State	Major state financial incentives for energy efficiency	Score (1 pt.)
Iowa	Energy Bank Revolving Loan Program	0.5
New Jersey	Clean Energy Program	0.5
Oklahoma	Commercial PACE financing	0.5
Kansas	None	0
New Jersey	None	0
South Dakota	None	0

Green Banks

States are increasingly leveraging private capital alongside public dollars to incentivize energy efficiency. One way of doing this is through green banks, which can overcome barriers faced by consumers and lenders in financing energy efficiency and renewable energy projects. While we do not currently give credit solely for the establishment of a green bank, we recognize the important contribution they make to incentivizing energy efficiency.[45] These financing institutions offer public dollars and leverage private funds to unleash new investment, reduce costs, and increase consumer demand in the clean energy sector. In addition, green banks often provide technical assistance to clean energy projects across sectors to help consumers understand available funding streams and to simplify the process of purchasing efficiency technologies (CGC 2015).

To more accurately assess the impacts of financing programs offered by green banks, policymakers and program administrators should collect data—and standardize data collection efforts—on the following metrics:

- *Energy savings:* Independently evaluated energy savings achieved as a result of green bank investments.
- *Leverage:* The ratio of private loan capital deployed and public or ratepayer funds used.
- *Market penetration:* In particular, whether financing is available to low-income, multifamily, and other underserved markets.
- *Coordination with utility programs:* The extent to which green banks and utilities coordinate program offerings.

[45] While we credit evaluated savings from financing programs (including on-bill financing programs) in the utilities chapter, in this chapter we recognize financing programs such as green banks that leverage additional, non-ratepayer state resources.

Leading and Trending States: Financial Incentives

Maine. Deployed statewide in October 2019 through Maine's Community Action Agency (CAA) network, MaineHousing's Heat Pump Program pays for the cost and installation of a heat pump for eligible Maine homeowners. Since its inception, the agency has supported the installation of at least 1,700 heat pump installations (Ogrysko 2022).

Hawaii. On April 8, 2019, Hawaii Governor David Ige formally announced the Green Energy Money $aver (GEM$) on-bill financing program, a statewide initiative to make clean energy more affordable for homes and small businesses. The culmination of more than seven years of work by Hawaiian authorities, the program provides easy-access financing for cost-effective rooftop solar panels and other renewable distributed energy systems, as well as energy efficiency upgrades. The GEM$ On-Bill Program is available to about 95% of Hawaii's population. In addition to rooftop solar, eligible projects include solar hot-water heaters, heat pump water heaters, and energy efficiency measures. Projects must be designed to reduce energy bills by at least 10% after accounting for repayment of the clean energy investment.

New Hampshire. The Clean Energy Fund invests in energy efficiency and renewable energy projects that reduce costs for New Hampshire businesses, nonprofits, and municipalities; help address New Hampshire's energy challenges in a fiscally and environmentally responsible manner; lower the state's contribution to global climate impacts; and reduce barriers for equitable access to clean energy benefits. Capitalized at more than $10 million, the fund merges four individual revolving loan funds dedicated to financing energy efficiency improvements and clean/renewable energy initiatives into a single program and application process, providing low-interest loans along with energy technical assistance and project funding guidance. Funding for the program comes from a combination of federal and state sources as well as the Community Development Finance Authority's own funds.

New York. The NY Green Bank (NYGB) was established in 2013 as a state-sponsored specialty financing entity housed within the New York State Energy and Development Authority (NYSERDA). NYGB combines funds from ratepayers and RGGI to leverage private clean energy capital. The total NYGB portfolio stands at more than $909 million, encouraging up to $2.4 billion in clean energy investments. NYGB's recent energy efficiency projects include financing the new construction of Saranac Waterfront Lodge, the first LEED-certified hotel in Adirondack Park, and providing a term loan to Ecosave, an energy services company, to support at least five energy efficiency or distributed generation projects. NYGB's investments have driven between 10 million and 18 million metric tons of gross lifetime GHG reductions, equivalent to removing up to 183,599 cars from the road for the next 23 years. These efforts support the state's goal of reducing GHGs 85% by 2050 (NYSERDA 2020).

Lead by Example

State governments can advance energy-efficient technologies and practices in the marketplace by adopting policies and programs to save energy in public-sector buildings and fleets, a practice commonly referred to as *lead by example*. In the current environment

of fiscal austerity, lead-by-example policies and programs are a proven strategy for improving the operational efficiency and economic performance of states' assets. Lead-by-example initiatives also reduce the negative environmental and health impacts of high energy use and promote energy efficiency to the broader public.[46]

States can show leadership in energy efficiency policy through the development of state energy plans, and most states have them.[47] Governors can issue executive orders or form planning committees to evaluate state energy needs, goals, and opportunities.[48] Sometimes legislatures initiate the process. These actions help establish a statewide vision for energy use. We do not award points solely for the existence of a state energy plan, but we do consider the formal executive orders and policies that execute energy efficiency initiatives included in such plans.

Scores for Lead by Example

States could earn up to 1 point in this category: 0.5 points for energy savings targets in new and existing state buildings, and 0.5 points for fleet fuel efficiency mandates. This year, we removed benchmarking requirements for public facilities and the energy savings performance contract (ESPC) activities from the scoring table to help make room for the new equity metrics. We based our review of states' lead-by-example initiatives on our survey of state energy officials as well as independent research.

State building requirements. Many states have adopted policies and comprehensive programs to reduce energy use in state buildings. State governments operate numerous facilities—including office buildings, public schools, colleges, and universities—and the energy costs of these facilities can account for as much as 10% of a typical government's annual operating budget. In addition, the energy consumed by a state's facilities can account for as much as 90% of its GHG emissions (DOE 2008). Only a handful of states have yet to implement an energy efficiency policy for public facilities. Mandatory energy savings targets for new and existing state government facilities are the most widely adopted state measures. These requirements encourage states to invest in the construction of new, efficient buildings and retrofit projects, lowering energy bills, and promoting economic development in the energy services and construction sectors. States also work toward these energy savings

[46] Energy efficiency limits harmful pollutants by reducing the need to burn fossil fuels to generate electricity. ACEEE and Physicians for Social Responsibility explore this connection in a joint fact sheet at aceee.org/fact-sheet/ee-and-health.

[47] See naseo.org/stateenergyplans.

[48] See ACEEE's *Energy Efficiency Toolkit for Governors* (2019) for more information: aceee.org/topic-brief/governors-ee-toolkit.

targets through activities such as ESPCs, benchmarking, and state energy office technical assistance to other agencies.

To earn credit, energy savings targets must commit state government facilities to a specific energy reduction goal over a distinct time period. We also gave 0.5 points to states that require state buildings to exceed the statewide energy code or meet a green building criterion such as Leadership in Energy and Environmental Design (LEED) certification.

Efficient fleets. In addition to lead-by-example initiatives in state government buildings, many states enact policies encouraging or requiring efficient vehicle fleets to reduce fuel costs and hedge against rising fuel prices. Collectively, state governments own approximately 500,000 vehicles, with a median fleet size of approximately 3,500. Operation and maintenance costs for these fleets each year exceed $2.5 billion nationwide, ranging from $7 million to $250 million per state (NCFSA 2007). In response to these costs, states may adopt an efficiency standard specifically for state vehicle fleets that reduces fuel consumption and GHG emissions.

For this category, states received credit only if the plan or policy for increasing the efficiency of its fleet contains a specific, mandatory requirement. For example, states could qualify for 0.5 points if fleet policies specify fuel economy improvements that exceed existing CAFE standards. Other policies that earned 0.5 points include binding goals to reduce petroleum use by a certain amount over a given time frame, meaningful GHG reduction targets for fleets, and procurement requirements for hybrid-electric or all-electric vehicles. However, state adoption of such targets does not guarantee that they will be achieved; we will continue to seek data on state progress toward meeting these goals and may revisit this metric in the future with an eye toward measured achievement of targets. We did not credit requirements for procuring alternative-fuel vehicles because such vehicles may not result in improved fuel economy.

Table 33 presents states' overall scores for lead-by-example efforts.

Table 33. State scores for lead-by-example initiatives

State	New and existing state building requirements	Efficient fleets	Score (1 pt.)
California	•	•	1
Colorado	•	•	1
Connecticut	•	•	1
Delaware	•	•	1
District of Columbia	•	•	1
Hawaii	•	•	1

State	New and existing state building requirements	Efficient fleets	Score (1 pt.)
Illinois	•	•	1
Louisiana	•	•	1
Maryland	•	•	1
Massachusetts	•	•	1
Minnesota	•	•	1
New Hampshire	•	•	1
New Jersey	•	•	1
New Mexico	•	•	1
New York	•	•	1
North Carolina	•	•	1
Oregon	•	•	1
Pennsylvania	•	•	1
Rhode Island	•	•	1
Tennessee	•	•	1
Texas	•	•	1
Utah	•	•	1
Vermont	•	•	1
Washington	•	•	1
Maine	•	•	1
Alabama		•	0.5
Arizona	•		0.5
Arkansas	•		0.5
Florida	•		0.5
Indiana	•		0.5
Kansas	•		0.5
Kentucky	•		0.5
Mississippi		•	0.5
Montana	•		0.5

State	New and existing state building requirements	Efficient fleets	Score (1 pt.)
Oklahoma	•		0.5
South Carolina	•		0.5
Virginia	•		0.5
West Virginia	•		0.5
Missouri	•		0.5
Alaska			0
Georgia			0
Idaho			0
Iowa			0
Michigan			0
Nebraska			0
Nevada			0
North Dakota			0
Ohio			0
South Dakota			0
Wisconsin			0
Wyoming			0

Carbon and Climate Action

Recent years have seen a surge in actions to strengthen GHG and renewable generation goals, including an increase in the number of states with 100% clean energy targets as well as emissions reduction goals. Accordingly, this metric examines state carbon pricing policies that have helped support and advance efficiency programs. These policies aim to put a price on carbon, the idea being that if emitting GHGs increases costs, then the market will find a way to reduce emissions at the lowest possible expense (Nadel, Gaede, and Haley 2021). States generally use two main types of pricing: a carbon tax and a cap-and-trade system. A carbon tax is a fee charged for each unit of CO_2 (typically a tonne) that is emitted. A cap-and-trade system sets a limit on the total amount of CO_2 that can be emitted and divides this total into emissions allowances. It then distributes these allowances among GHG-emitting companies, creating a market in which the certificates can be bought and sold.

Energy efficiency plays an important role in the successful implementation of carbon pricing policies. When the funds collected from these policies are invested in efficiency, they reduce energy use, energy bills, and energy-related emissions. That can help achieve net economic benefits and cushion the effect of a carbon pricing program on energy costs (Nadel, Gaede, and Haley 2021). For example, RGGI states have dedicated approximately 40% of the funds they have raised from cap-and-trade activity to energy efficiency (RGGI 2021). That has resulted in decreased emissions, lower customer bills, lower wholesale power prices, new jobs, and a stronger local economy (Hibbard et al. 2018).

In addition, this year, we removed two submetrics: tracking avoided GHG emissions through energy efficiency programs, and whether utilities included avoided costs from emissions reductions in their cost-effectiveness screening. Instead, we added a new metric on whether a state currently has a statewide emissions reduction goal in place. Despite the increase in the number of states with emissions reduction goals, states are largely not on track to meet these targets (Berg, Cooper, and Molina 2021). Energy efficiency can help states close the gaps and reach their climate goals (Berg, Cooper, and Molina 2021).[49]

Because fossil fuels still account for a significant portion of utility-scale generation in the U.S., expanding energy efficiency efforts can provide immediate reductions in emissions (Berg, Cooper, and Molina 2021). In addition, as renewable generation increases, energy efficiency can help optimize and reduce the amount and cost of renewable energy in three ways: by lowering overall electricity consumption, reducing peak demand, and enabling load flexibility and load shaping (by allowing grid operators to control system load and optimize grid performance). Finally, energy efficiency can help facilitate electrification by decreasing the amount of new generation needed as sectors shift to electricity, thus enabling decarbonization efforts while lowering system costs and mitigating ratepayer risks (Berg, Cooper, and Molina 2021).

Scores for Carbon and Climate Action

States could earn up to 1 point in this category: 0.5 points for having either a carbon tax or a cap-and-trade policy in place, and 0.5 points for having a statewide emissions reduction goal in place. Table 34 highlights the total scores for these metrics.

Table 34. State scores for carbon and climate action metrics

[49] We used NRDC's Race to 100% Clean interactive map and our own previous research (see Berg, Cooper, and Molina 2021) to determine which states earned credit for this metric. We did not include U.S. Climate Alliance members or any states with goals that focus solely on the power sector.

State	Carbon pricing policy	Statewide emissions reduction goal	Score (1 pt.)
California	•	•	1
Connecticut	•	•	1
Delaware	•	•	1
Maine	•	•	1
Maryland	•	•	1
Massachusetts	•	•	1
New Hampshire	•	•	1
New Jersey	•	•	1
New York	•	•	1
Rhode Island	•	•	1
Vermont	•	•	1
Oregon	•	•	1
Arizona		•	0.5
Colorado		•	0.5
District of Columbia		•	0.5
Florida		•	0.5
Hawaii		•	0.5
Louisiana		•	0.5
Michigan		•	0.5
Minnesota		•	0.5
Nevada		•	0.5
New Mexico		•	0.5
North Carolina		•	0.5
Pennsylvania		•	0.5
Virginia	•		0.5
Washington		•	0.5
Alabama			0
Alaska			0
Arkansas			0

State	Carbon pricing policy	Statewide emissions reduction goal	Score (1 pt.)
Georgia			0
Idaho			0
Illinois			0
Indiana			0
Iowa			0
Kansas			0
Kentucky			0
Mississippi			0
Missouri			0
Montana			0
Nebraska			0
North Dakota			0
Ohio			0
Oklahoma			0
South Carolina			0
South Dakota			0
Tennessee			0
Texas			0
Utah			0
West Virginia			0
Wisconsin			0
Wyoming			0

State Government and Equity

An integral ACEEE focus area 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, historically underserved, and environmental justice communities. These individuals often face disproportionately high energy burdens—that is, they spend a larger percentage of their income on energy bills than their counterparts do (Drehobl, Ross, and Ayala 2020). 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. Furthermore, these communities' underrepresentation in clean energy policymaking and planning means that many of the benefits of these policies do not equitably reach all communities.

Earlier *State Scorecard*s have included a limited selection of state policies that specifically address low-income household access to energy efficiency programs. This year, however, ACEEE has placed greater emphasis on addressing these issues by adding crucial new metrics that can help states reduce low-income households' energy burdens. In this chapter, we have added three new metrics that we hope will help states direct their focus toward equity-related issues.[50]

The first new metric is state dedication of revenues to energy efficiency equity initiatives. Energy efficiency programs for low-income households are often supported by a diverse array of funding streams that may include federal, state, or ratepayer dollars. The programs may be administered by utilities, state government, community action agencies, or other organizations. In Chapter 2, we specifically highlighted utility- and ratepayer-funded income-qualified programs; in practice, these programs often use other resources as well, since nonutility weatherization funding can be used to leverage ratepayer funds and vice versa. States themselves can do more by dedicating a portion of their revenues to energy efficiency equity initiatives. These revenues can come as a result of the carbon pricing policy or, if a state does not have such a policy in place, from areas such as general state revenues or specific targeted revenue sources such as energy taxes. By investing these revenues—especially those gathered from carbon pricing policies—on low-income households and other underserved communities, states can ensure that benefits are equitably distributed and avoid placing disproportionate cost burdens on already disadvantaged communities.

States can invest carbon pricing policy funds into these underserved communities in several ways (Subramanian and MacPherson 2022). States can invest in pre-weatherization measures to help make homes more eligible for existing weatherization and energy efficiency programs. They can establish a green bank to attract and leverage private capital to help fill gaps in project funding, such as for rural efficiency or clean energy projects. They can dedicate funds to support energy efficiency workforce development programs and ensure that environmental justice communities and workers especially impacted by the energy transition are able to access these jobs and are paid fairly. These steps and more can help states ensure more equitable distribution of economic and environmental benefits.

[50] ACEEE selected these metrics through the Leading with Equity process.

The next two metrics came in part from ACEEE's work in the *Pathways to Healthy, Affordable, Decarbonized Housing Scorecard* (Hayes et al. 2022). For these strategies to succeed, states must work with community leaders and local organizations who best know the needs of the localities that states are looking to support. Our second new equity metric, therefore, measures whether the state has an equity task force or dedicated staff to address equity concerns. This metric will credit state planning processes that include a commitment to strengthening engagement with environmental justice communities. By having an advisory council, collaborative, working group, or state agency office that acts as a contact point with marginalized groups and consults with environmental justice organizations, states can better understand the needs of these communities and create appropriate strategies to assist them.

To earn points for this metric, states had to prove that they were taking active steps to increase engagement with marginalized groups. Simply having a task force or dedicated staff member, for example, was not enough to earn credit. We used three main criteria to grade states:

- The majority of the group or task force is made up of members from historically marginalized communities or organizations.
- The group or task force is currently active and striving to achieve increased engagement with marginalized communities, or other relevant goals set by the task force or group.
- The group or task force is affecting or influencing state policies, programs, or plans, or has the power to do so (e.g., their powers are spelled out in a law or ordinance).

Finally, we added a new metric on statewide goals to reduce energy burden. Setting specific energy affordability or energy justice goals increases the likelihood that low-income households and other disadvantaged communities will get the energy assistance they need. It also provides states with a framework to track their progress in helping these households reduce their energy use. This metric awards points to states that have specific goals or strategies to lower statewide energy burdens for low-income households and that set a plan or track progress toward achieving those goals.

Scores for state government and equity

States could earn up to 1.5 points in this category: 0.5 points for dedicating revenues, either those gathered from carbon pricing policies or other types of revenues, to energy efficiency equity initiatives; 0.5 points for having an equity task force or dedicated staff to address equity concerns; and 0.5 points for having a specific statewide goal in place to reduce energy burden, with either a plan or actual tracking of progress toward the goal.

Table 35. State scores for state government and equity metrics

State	Dedication of state revenues	Equity task force or dedicated staff	Energy burden reduction goals and progress	Score (1.5 pts.)
California	•	•	•	1.5
Maine	•	•	•	1.5
Massachusetts	•	•	•	1.5
New York	•	•	•	1.5
Oregon	•	•	•	1.5
Rhode Island	•	•	•	1.5
Virginia	•	•	•	1.5
Connecticut	•	•		1
Illinois		•	•	1
Maryland	•	•		1
Michigan		•	•	1
Vermont		•	•	1
Colorado		•		0.5
District of Columbia	•			0.5
Minnesota		•		0.5
New Mexico		•		0.5
New Jersey		•		0.5
Washington			•	0.5
Alabama				0
Alaska				0
Arizona				0
Arkansas				0
Delaware				0
Florida				0
Georgia				0
Hawaii				0
Idaho				0

State	Dedication of state revenues	Equity task force or dedicated staff	Energy burden reduction goals and progress	Score (1.5 pts.)
Indiana				0
Iowa				0
Kansas				0
Kentucky				0
Louisiana				0
Mississippi				0
Missouri				0
Montana				0
Nebraska				0
Nevada				0
New Hampshire				0
North Carolina				0
North Dakota				0
Ohio				0
Oklahoma				0
Pennsylvania				0
South Carolina				0
South Dakota				0
Tennessee				0
Texas				0
Utah				0
West Virginia				0
Wisconsin				0
Wyoming				0

Leading and Trending States: State Government and Equity

Virginia. 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 2020a). Also, per 2020 legislation, 50% of funds generated by the state's recent entry into RGGI are to be directed toward low-income energy efficiency programs (Virginia General Assembly 2020b). This amounted to $21 million in fiscal year 2021 (Vogelsong 2021) given to the Department of Housing and Community Development and split between the Weatherization Deferral Repair Program and the Affordable and Special Needs Housing Program (HIEE 2022). The state also passed a law in 2021 that establishes a program to ensure that low-income ratepayers don't pay more than 6% of their income on energy bills (Virginia General Assembly 2021).

Washington. The state'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).

Massachusetts. 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 included program administrators and organizations representing environmental justice populations. In 2021, the EWG presented its recommendations to the full council to inform utilities' 2022–2024 Three-Year Energy Efficiency Plan. Based on these recommendations, the three-year plan 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 2021).

New Jersey. As part of the ongoing energy efficiency transition, 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 intend to enable the state and utilities to make programmatic and policy decisions with real-time feedback from the impacted communities.

Chapter 6. Industrial Efficiency Policies

Author: Andrew Hoffmeister

INTRODUCTION

The industrial sector is one of the largest sources of GHG emissions in the United States, accounting for approximately 30% of the nation's energy-related GHG emissions and nearly one-third of primary energy use (AEA 2022). The highest emitting industrial sectors include petroleum refining, chemicals, food and beverage manufacturing, cement, and iron and steel.[51] In addition to being carbon intensive, these sectors are key components of the U.S. economy, as industry accounts nationally for approximately 11% of GDP (NAM 2019). Although there has been significant progress in policies aiming to reduce emissions from other sectors, energy efficiency policies in support of industrial decarbonization have lagged behind. Industry has been historically underserved by energy efficiency programs because of the difficulty of designing programs suited to the diversity of processes and energy inputs of different industries. Demand for industrial products is anticipated to grow 30% by 2050, accompanied with a predicted 15% increase in emissions, reflecting continuing technology advances and modernization (AEA 2022). Given the magnitude of transformation required to offset these projections, we need to accelerate the decarbonization of the industrial sector through energy efficiency. Although states may not be able to match the federal government's ability to accelerate larger scale capital intensive decarbonization measures, state policy has unique potential to foster advancements in energy efficiency in other critical arenas, including energy management,[52] decarbonization targets, and workforce development.

We created the industrial category for this version of the *Scorecard* to capture state industrial energy efficiency policies and to acknowledge the increasing need for action in mitigating industrial GHG emissions. Scores for the industrial category reflect state actions that go beyond existing federal policies and can serve as examples for other states seeking to decarbonize their industrial sectors through energy efficiency. Energy management and expanding a workforce that can help industry accommodate the low-carbon transition are two essential approaches that states can take to help reduce both current and future

[51] Definitions of the industrial sector differ. In this chapter, we use the term *industrial sector* to refer primarily to manufacturing. Agriculture and mining are also significant sources of emissions that are part of the total calculated from the sector, but state efforts addressing these parts of industry are not included in this edition of the *Scorecard*.

[52] *Energy management* refers to controlling energy streams and reducing energy use through continuous improvements in efficiency practices. Energy management and strategic energy management (SEM) are defined later in greater detail.

industrial emissions. The metrics evaluated in the industry section of the *Scorecard* include whether states have established specific state targets aimed at GHG reductions in the industrial sector, whether a state has programs that offer technical assistance for energy management, and whether states offer industrial workforce training.

SCORING AND RESULTS

In this chapter, states could earn up to 2.5 points as follows:

- Statewide strategic energy management (I-SEM) program (1 point) or technical support for energy management and/or audits, including state support for Industrial Assessment Centers (IACs) and/or utility offered energy audits (0.5 points of 1 point total)
- An industrial decarbonization target or clean heat standard, which can result in energy use and emissions reductions beyond those in the industrial sector (1 point for either)
- State-supported job training for industrial energy efficiency (0.5 points)

States could also lose 1 point for allowing electric or natural gas customers, or both, to opt out of energy efficiency programs.

Table 36 presents the overall results of scoring on industrial policies. Explanations of each metric follow.

California, Connecticut, the District of Columbia, Massachusetts, Maine, Minnesota, New York, and Washington all received the highest possible scores for their industrial energy efficiency policies. Massachusetts earned a share of the top spot through a portfolio of industrial energy efficiency measures including Mass Save, which offers technical expertise to help industrial facilities identify energy savings measures. Maine's score in part reflects its efforts to offer a wide purview of commercial and industrial (C&I) education, training, and technical assistance to industrials. Minnesota earned a top position in part for its clean heat standard, which aims to help natural gas utilities meet the state's GHG reduction goals through energy efficiency, electrification, and low-carbon fuels. California's share of the top spot reflects its robust targets for decarbonizing the industrial sector as a whole, as well as energy-intensive industrial subsectors in particular. Washington received the maximum number of points and should be recognized for its State University Energy Program, which offers technical assistance to industrial customers. New York's maximum score reflects its focus on industrial decarbonization, and specific programs including NYSERDA's State Supported Job Training for Industrial Efficiency. The District of Columbia achieved its score in part due to the D.C. Sustainable Energy Utility (DCSEU) SEM program, which helps reach students with energy management training. Connecticut earned the maximum number of points thanks to programs such as a certified energy manager training program, among other workforce generating programs, and its on-demand technical assistance webinars for energy management practices.

Table 36. Summary of scores for industrial efficiency policies

State	Strategic energy management (1 pt.)	Industrial decarbonization target or clean heat standard (1 pt.)	State-supported job training (0.5 pts.)	Opt-out provisions for large customers (–1 pt.)	Total score (2.5 pts.)
California	1	1	0.5	0	2.5
Connecticut	1	1	0.5	0	2.5
District of Columbia	1	1	0.5	0	2.5
Maine	1	1	0.5	0	2.5
Massachusetts	1	1	0.5	0	2.5
Minnesota	1	1	0.5	0	2.5
New York	1	1	0.5	0	2.5
Washington	1	1	0.5	0	2.5
Colorado	1	1	0	0	2
Oregon	1	1	0	0	2
Delaware	1	0	0.5	0	1.5
Hawaii	1	0	0.5	0	1.5
Michigan	1	0	0.5	0	1.5
Nevada	1	0	0.5	0	1.5
New Mexico	1	0	0.5	0	1.5
Rhode Island	1	0	0.5	0	1.5
Tennessee	1	0	0.5	0	1.5
Virginia	1	1	0.5	-1	1.5
Utah	1	0	0.5	0	1.5
New Jersey	1	0	0	0	1
Vermont	1	0	0	0	1
Wisconsin	1	0	0	0	1
Idaho	0	0	0.5	0	0.5
Iowa	1	0	0.5	-1	0.5
Maryland	0	0	0.5	0	0.5

State	Strategic energy management (1 pt.)	Industrial decarbonization target or clean heat standard (1 pt.)	State-supported job training (0.5 pts.)	Opt-out provisions for large customers (–1 pt.)	Total score (2.5 pts.)
Mississippi	0	0	0.5	0	0.5
Missouri	1	0	0.5	-1	0.5
Montana	0	0	0.5	0	0.5
Nebraska	0	0	0.5	0	0.5
New Hampshire	0	0	0.5	0	0.5
North Carolina	1	0	0.5	-1	0.5
Pennsylvania	0	0	0.5	0	0.5
Alabama	0	0	0	0	0
Alaska	0	0	0	0	0
Arizona	0	0	0	0	0
Florida	0	0	0	0	0
Georgia	0	0	0	0	0
Indiana	0	0	0	0	0
Kansas	0	0	0	0	0
Louisiana	0	0	0	0	0
North Dakota	0	0	0	0	0
South Dakota	0	0	0	0	0
Wyoming	0	0	0	0	0
Oklahoma	0	0	0.5	-1	-0.5
Illinois	0	0	0.5	-1	-0.5
Arkansas	0	0	0	-1	-1
Kentucky	0	0	0	-1	-1
Ohio	0	0	0	-1	-1
South Carolina	0	0	0	-1	-1
Texas	0	0	0	-1	-1

State	Strategic energy management (1 pt.)	Industrial decarbonization target or clean heat standard (1 pt.)	State-supported job training (0.5 pts.)	Opt-out provisions for large customers (–1 pt.)	Total score (2.5 pts.)
West Virginia	0	0	0	-1	-1

DISCUSSION

Statewide Strategic Energy Management Program

Strategic energy management (SEM) is an approach to energy management that has been increasing in use and effectiveness in recent years. SEM is data driven and allows organizations to achieve systematic energy performance improvements. Public programs that offer SEM typically provide technical support to agriculture and industrial participants through training, onsite energy audits, the development of energy savings plans, and assistance in implementing energy savings measures. SEM also enables peer-to-peer knowledge exchange about best energy management practices. Many public SEM programs are modeled after the International Organization of Standardization (ISO) 50001 standard for energy management and/or operate to prepare participants for ISO 50001 certification. ISO 50001 provides a framework of requirements for organizations to develop energy efficiency policies, establish targets, collect data, and continuously improve energy management (ISO 2022).

Other support for SEM measures includes DOE's 50001 Ready program, and technical guidance for navigating the 50001 Ready platform.[53] SEM programs run by public agencies and utilities can also offer a cohort model, in which clusters of similar industries can participate in energy management practices together and share learning. No two SEM programs are exactly alike. Some programs are delivered through cohort engagements, while others are delivered to individual participants. Some are standalone programs, while others offer SEM as a subcomponent of a larger program. Some aim at helping industry reach certain levels of certification for energy management practices, while others seek to simply enable educational workshops and energy coaching. State governments are positioned to evaluate the unique needs of industries in their state to determine the best

[53] DOE's 50001 Ready program recognizes facilities that are implementing ISO 50001-based energy management systems in a self-serve format. The program is intended to serve as a means of developing an energy management structure that does not require external certifications or audits. For more on the 50001 Ready program, see https://www.energy.gov/eere/amo/50001-ready-program.

SEM practices to offer in order to maximize energy savings and minimize cost and GHG emissions. The goal of this section of the *Scorecard* is to recognize existing efforts in promoting SEM and energy management.

We awarded 1 point to states that have established statewide strategic energy management (SEM) programs or provide technical assistance to industrial customers seeking to certify performance or energy management systems such as SEM, ISO 50001, 50001 Ready, or other functionally similar programs. States including Louisiana, California, New York, and Oregon have developed such energy management programs or indicated their intention to do so. We awarded 0.5 points to those states that have plans to establish energy management and/or technical assistance for energy management programs. Several states offer programs through state agencies that recognize and assist companies with energy management and energy audits beyond the level of existing regulatory requirements. State programs supporting energy management and energy audits often operate in tandem with DOE's Industrial Assessment Centers, which in 2021 alone performed more than 19,700 assessments, enabling average energy savings of 4,653 MMBtu per assessment (DOE 2021a). Statewide SEM programs have substantial potential for energy savings, as they often report savings as high as 10% of annual energy consumption for participants; nationwide recognition program participants are typically required to reach similar savings thresholds (Bernath and Buffum 2017).

Industrial Decarbonization Target or Clean Heat Standard

Although some 24 states and the District of Columbia have set various types of GHG reduction goals, these plans often do not include specific targets for the industrial sector, let alone for individual subsectors (C2ES 2021). The market signals and policy directions created by such sector-specific targets are invaluable for helping industry begin to accommodate the transitions needed for decarbonization as outlined targets reduce uncertainty and typically improve participation in voluntary programs. Emissions inventories that are often associated with established reduction goals are important tools for tracking progress across sectors. Periodically updated scoping plans, often required in establishing long-term reduction goals, lay out strategy for reaching benchmarks, ensuring that new findings, technologies, and strategies are incorporated into planning. Stakeholder coordination and implementation guidelines are fostered in large part through the establishment of decarbonization targets. Reductions in industrial emissions will be achieved from a combination of market approaches, incentives, policies, and voluntary action, all of which must be built around specific target planning and goal setting.

A state's clean heat standards typically require natural gas utilities and fossil fuel companies to reduce emissions. Companies can meet the standard through carbon offsets or by reducing the emissions intensities of the fuels they are producing. This helps accelerate industrial decarbonization by decreasing the carbon intensity of fuels needed for industrial processes, especially natural gas. For example, Minnesota's Natural Gas Innovation Act, also established GHG reduction targets for natural gas utilities and a framework for them to meet those goals through strategies including biogas, low-carbon fuels, electrification, and energy

efficiency (MNPUC 2021). As the need for rapid transformation in the industrial sector increases, it is likely that we will see more clean heat standards proposed, especially in states with heavy industry that rely on high process heat. Additionally, clean heat standards are not just specific to the industrial sector but can extend to other sectors; such standards are important for their ability to enable cross-cutting energy savings and emissions reductions across the economy. We awarded 1 point to states that have created an industrial decarbonization target[54] or a clean heat standard. Some states, including Wisconsin and Colorado, are aiming to establish emissions targets for their industrial sectors, including manufacturing; other states, including California, have established targets for unique subsectors, such as cement. These targets will need to increasingly consider economic guidance for cost-effective decarbonization at the intersection with approaches such as cap and trade. Table 37 shows scores for decarbonization targets or clean heat standards.

Table 37. State scores for decarbonization targets or clean heat standards

State	Industrial decarbonization target	Clean heat standard	Score (1 pt.)
Colorado	•		1
Connecticut	•		1
District of Columbia	•		1
Maine	•		1
Massachusetts	•		1
Minnesota		•	1
New York	•		1
Oregon	•		1
Virginia	•		1
Washington	•		1

State-Supported Job Training for Industrial Energy Efficiency

A critical measure for advancing energy efficiency in industry and accelerating industry decarbonization involves supporting efforts to help the industrial workforce transition from

[54] Targets include both those with and without regulatory force. Future versions of the *Scorecard* may focus on those targets supported by regulatory action.

fossil-fuel-based technologies to lower carbon technologies. This transition involves reskilling for newly created and altered jobs in an equitable way, sometimes referred to as a "just transition." Just transitions will involve identifying the training and economic needs required to support workers, economic well-being, and a diverse, inclusive workforce. Some leading states have already established initiatives to facilitate just transitions to low-carbon economies. Common elements of workforce transitions include the development of roadmaps, proposing timelines, creating economic resilience funds for workers, support for vocational/technical schools, creating stakeholder communication platforms, and establishing career training and reskilling programs.

We awarded 0.5 points for states that support job training and just transition plans for energy efficiency capabilities in industry. A diverse, engaged, and knowledgeable workforce will be needed to overcome the many technical, economic, and behavioral barriers expected in decarbonizing industry while improving the competitiveness of U.S. industry. Support can take the form of programs that offer practical experience, training, and/or certification in relevant energy- or emissions-saving measures for industrial processes, including Certified Energy Management (CEM). These efforts can operate along with technical assistance, especially to small- and medium-sized manufacturers who are traditionally underserved by efficiency efforts and have limited resources (SEE Action 2014). Examples of state workforce development efforts toward developing energy efficiency capabilities in industry can be seen under executive authority in California and North Carolina, and under state agencies in Colorado and Connecticut. Table 38 shows states that support job training for industrial energy efficiency.

Table 38. States that support job training for industrial energy efficiency (IEE)

State	Support for IEE Workforce	Score
California	•	0.5
Connecticut	•	0.5
District of Columbia	•	0.5
Delaware	•	0.5
Hawaii	•	0.5
Idaho	•	0.5
Iowa	•	0.5
Illinois	•	0.5
Maine	•	0.5
Maryland	•	0.5
Massachusetts	•	0.5
Michigan	•	0.5

State	Support for IEE Workforce	Score
Minnesota	•	0.5
Mississippi	•	0.5
Missouri	•	0.5
Montana	•	0.5
Nebraska	•	0.5
Nevada	•	0.5
New Hampshire	•	0.5
New Mexico	•	0.5
New York	•	0.5
North Carolina	•	0.5
Oklahoma	•	0.5
Pennsylvania	•	0.5
Rhode Island	•	0.5
Tennessee	•	0.5
Utah	•	0.5
Virginia	•	0.5
Washington	•	0.5

Opt-Out Provisions for Large Customers

We include opt-out as a category in which states may lose rather than gain points. We subtracted 1 point for states that allow electric or natural gas customers, or both, to opt out of energy efficiency programs. In many cases, large commercial and industrial customers seek to opt out of utility energy efficiency programs, asserting either that they have already captured all the energy efficiency that is cost effective, or that they can make better improvements in-house. However, this is seldom the case (Chittum 2011). We did not subtract points for self-direct programs as, when implemented properly, these programs can effectively meet the needs of large customers. Opt-out and exemption policies have several negative consequences, and typically reduce the effectiveness of industrial decarbonization measures. Failure to include large-customer programs in an energy efficiency portfolio increases the cost of energy savings for all customers and reduces the benefits (Baatz, Relf, and Kelly 2017). In effect, allowing large customers to opt out forces other consumers to indirectly subsidize them: Those who opt out share some of the system benefits, but only the smaller customers are paying to support energy efficiency programs. It also prevents utilities from capturing all highly cost-effective energy savings; this can contribute to higher overall

system costs through the use of more expensive supply resources. Opt-out policies also make measurement and verification of savings more difficult because it is unclear how much additional savings are being captured from opted-out customers. Table 39 shows states with opt-out programs.

Table 39. States allowing large customers to opt out of energy efficiency programs

State	Opt-out description	Score
Arkansas	Under Act 253, passed in 2013, customers with more than 1 MW or 70,000 MMBtu in monthly demand may opt out. Large manufacturers that file under Act 253 do not have to offer documentation of planned or achieved savings. However, large commercial and industrial (C&I) customers not meeting the definition of manufacturing, and customers that have filed under Section 11 of the state's Rules for Conservation and Energy Efficiency Programs, must file an application showing how savings have been or will be achieved. More than 50 large customers have opted out, constituting a significant share of overall sales (which varies by utility). In 2017, HB 1421 added state-supported higher-education institutions to the list of customers eligible to opt out.	–1
Illinois	Illinois' Climate and Equitable Jobs Act (CEJA) removes the exemption of large (over 10 MW) customers and replaced it with an opt-out provision. Eligible large customers who want to participate in electric efficiency programs have the opportunity to do so, but may choose to opt out.	–1
Indiana	Opt-out applies to the five	–1

State	Opt-out description	Score
	investor-owned electric utilities. Eligible customers are those that operate a single site with at least one meter constituting more than 1 MW demand for any one billing period within the previous 12 months. Documentation is not required. No evaluation is conducted. Approximately 70–80% of eligible load has opted out.	
Iowa	Iowa Code § 476.6(15)(a)(1)(b) allows any customer of any rate-regulated utility to request an exemption from participation in the five-year energy efficiency plan if the cumulative cost effectiveness of the combined energy efficiency and demand response plan does not pass the Ratepayer Impact Measure (RIM) test. This applies to all customers, not just large ones. Utilities must allow the exemption (opt out) beginning in the year following the year in which the request was made. Utilities may request modifications of their energy efficiency plans due to reductions in funding resulting from customer exemptions.*	–1
Kentucky	Opt-out is statewide for the industrial rate class. Documentation is not required. Approximately 80% of eligible load has opted out, with the remaining 20% made up primarily of TVA customers.	–1
Missouri	Opt-out is statewide only for investor-owned electric utilities. Eligibility requires one account	–1

State	Opt-out description	Score
	greater than 5 MW, or aggregate accounts greater than 2.5 MW and demonstration of the customer's own demand-side savings. Also, interstate pipeline pumping stations of any size are eligible to opt out. To maintain opt-out status, documentation is required for customers whose aggregate accounts are greater than 2.5 MW. The staff of the Missouri Public Service Commission perform a desk audit of all claimed savings and may perform a field audit. No additional EM&V is required.	
North Carolina	All industrial-class electric customers are eligible to opt out. Also, by Commission Rule R8-68 (d), large commercial-class operations with 1 million kWh of annual energy consumption are eligible to opt out. Customers electing to opt out must notify utilities that they have implemented or plan to implement energy efficiency. Opted-out load represents approximately 40–45% of industrial and large commercial load.	–1
Ohio	Ohio Senate Bill 310 (2014) allowed certain large customers to opt out of energy efficiency programs entirely if they receive service above the primary voltage level (e.g., subtransmission and transmission rate schedules) or are a C&I with more than 45 million kWh usage per year. HB 6, signed in 2019, expanded the opt-	–1

State	Opt-out description	Score
	out to include any C&I customer that uses more than 700 MWh annually or is part of a national account involving multiple facilities in one or more states. A written request is required to register as a self-assessing purchaser pursuant to section 5727.81 of the Revised Code.	
Oklahoma	All transportation-only gas customers are eligible to opt out. For electric utilities, all customers whose aggregate usage (which may include multiple accounts) is at least 15 million kWh annually may opt out. Some 90% of eligible customers opt out.	–1
South Carolina	Industrial, manufacturing, and retail commercial customers with at least 1 million kWh annual usage are eligible to opt out. Only self-certification is required. Approximately 50% of eligible companies opt out, representing roughly 50% of the eligible load.	–1
Texas	In Texas, for-profit customers that take electric service at the transmission level are not allowed to participate in utilities' energy efficiency programs and therefore do not contribute to them. Manufacturers that qualify for a tax exemption under Tax Code §151.317 may also apply to opt out for three years and opt-out status can be renewed.	–1
Virginia	The Virginia Clean Economy Act (VCEA) (2020) replaces a previous automatic opt-out for industrial customers above 500 kW with a process enabling industrial	–1

State	Opt-out description	Score
	customers using more than 1 MW to opt out after demonstrating that they are achieving energy savings through their own energy efficiency measures. The VCEA directs the commission, no later than June 30, 2021, "to adopt rules or regulations (a) establishing the process for large general service customers to apply for such an exemption, (b) establishing the administrative procedures by which eligible customers will notify the utility, and (c) defining the standard criteria that shall be satisfied by an applicant in order to notify the utility, including means of evaluation measurement and verification and confidentiality requirements."	
West Virginia	Opt-out is developed individually by utilities. Customers with demand of 1 MW or greater may opt out. Participants must document that they have achieved similar or equivalent savings on their own to retain opt-out status. Claims of energy and/or demand reduction are certified to utilities, with future evaluation by the Public Service Commission to take place in a later proceeding. The method has not been specified. Twenty large customers have opted out.	–1

Maine does not require large electricity customers to pay into energy efficiency programming through rates; these customers are thus ineligible for incentives from Efficiency Maine Trust's Electric Efficiency Procurement funds. The 1-point penalty has been removed for Maine this year given that efficiency incentives for these customers are funded with Forward Capacity Market (FCM) revenues and RGGI funds. Until recently, Maine's largest natural gas customers were also exempt from contributing to the Natural Gas Efficiency Procurement. However, in the spring of 2017, the legislature amended the law codifying the inclusion of large, non-generator users. *The RIM test treats reduced energy sales as a cost, which means that the more energy a measure saves, the less cost effective it is. It is likely that the plans will not

meet this impact measure, raising the possibility that many customers will opt out and thereby reduce efficiency funding by the amount they otherwise would have paid.

Chapter 7. Appliance and Equipment Efficiency Standards and Clean Lighting

Author: Brian Fadie

INTRODUCTION

Since February 2022, four states—Maryland, New Jersey, Oregon, and Washington—have adopted energy- and water-saving appliance standards, a rapid series of victories for consumers, businesses, and the climate. The new state laws will establish minimum energy and water efficiency levels for up to 17 types of products including air purifiers, computers, showerheads, 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 14 jurisdictions in total—those above plus California, Colorado, Hawaii, Maine, Massachusetts, Nevada, New York, Rhode Island, Vermont, and Washington—adopting standards since 2018. To build on this progress, more states can adopt standards that will cut their own energy and water waste and pave the way for new national standards that would deliver even larger reductions in climate-warming emissions.

The power of appliance standards is in the numbers. Every day we use appliances, equipment, and lighting in our homes, offices, and public buildings. Even when the energy consumption of a particular device seems small, the extra energy consumed by less-efficient products collectively adds up to a substantial amount. For example, New Jersey is expected to avoid 4.5 million metric tons of carbon dioxide emissions by 2040 due to the appliance standards adopted this year. However, persistent market barriers inhibit sales of more efficient models to consumers. Appliance efficiency standards overcome these barriers by initiating change at the manufacturer level, requiring appliance makers to meet minimum efficiency criteria for all products and thereby removing the most inefficient products from the market.

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 standards 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. The federal laws have typically set initial standards for specific products and required DOE to periodically review and, if warranted, strengthen them. More than 60 products are now subject to national efficiency standards. Most directly relate to energy use, although several address water efficiency.

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 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 the ACEEE report *States Go First* (Mauer, deLaski, and DiMascio 2017).[55] States are free to set standards for any products that are not subject to national standards. Efficiency levels for products in the ASAP model bill are based on California standards, industry standards, and ENERGY STAR® and WaterSense specifications.

During the period covered by this year's *Scorecard*, New Jersey adopted standards for 17 water- and energy-consuming products while Maryland adopted standards for 11 products. Washington added to its already strong suite of standards by adopting six new or updated standards. Oregon similarly added to an existing list of standards by adopting efficiency requirements for spray sprinkler bodies, which are expected to save 107 billion gallons of water in the drought-parched state by 2040. New York passed a new appliance standards law granting NYSERDA the authority to adopt standards through a rulemaking process. However, while this rulemaking process is expected to begin in 2022, because it will not be completed until after this *Scorecard* is finalized, the state could not yet receive energy savings credit for its new law.

In 2022, Vermont became the first state in the nation to adopt a clean lighting policy that will disallow the sale of certain mercury-containing fluorescent light bulbs. Specifically, screw-based compact fluorescent lamps (CFLs) and four-foot linear fluorescent lamps, which are by far the most common type of linear fluorescent lamp, will be disallowed for sale beginning in February 2023 and January 2024, respectively. Because the LED light bulbs that will replace them are both mercury-free and twice as energy efficient, the state will see reductions in mercury waste as well as energy and utility bill savings and carbon dioxide emissions reductions. In September 2022, California became the second state to adopt a clean lighting policy. By the start of 2025, the sale of almost all types of fluorescent bulbs will not be allowed. Vermont and California are paving the way for other states to join in reaping the benefits from a clean lighting policy.

[55] 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.

SCORING AND RESULTS

States could earn up to 3.0 points for energy savings achieved by state-adopted clean lighting policies and appliance standards that are not currently preempted by federal standards. In previous *Scorecards,* 0.5 of the 3.0 points could be awarded for adopting provisions to protect against the rollback of light bulb and other federal standards. This was meant to incentivize and recognize states adopting policies that would continue to achieve energy savings even if the federal government did not complete or rolled back the light bulb standards. However, because the federal government has finalized the light bulb standards, the 0.5 point carve out is no longer necessary and has been removed.

We credited standards only if the compliance date (not the adoption date) for at least one state with an equivalent standard was within the past five calendar years or is slated for the future. This acknowledges the important role early adopters play in paving the way for other states. For example, California adopted efficiency standards for faucets in 2015, followed by Vermont in 2018 and Colorado, Hawaii, New York, and Washington in 2019 (with compliance required in 2020 and 2021). California and the above states will continue to get credit for faucet standards until at least 2026 (five years after the last compliance date)—or even longer should additional states adopt the faucet standards.

We calculated scores for the adoption of state standards on the basis of cumulative per capita savings (measured in million Btus) through 2035. We used a floating start date that aligns with each state's product compliance date. For example, standards for commercial dishwashers took effect in Vermont in 2020. Our savings analysis for that product in Vermont covers the period from 2020 to 2035. Colorado and Washington adopted standards for commercial dishwashers that will take effect in 2021, and so for those states, the analysis period begins in 2021.

Our savings estimates were based on the approach used by ASAP and ACEEE in previous analyses of savings from appliance standards (Mauer, deLaski, and DiMascio 2017). We used estimates of annual shipments, per-unit energy savings, and average product lifetimes based on the best available data. To estimate state-by-state shipments, we allocated national shipments to individual states based on population. We also accounted for the portion of sales that had already met the standard level at the time the first state standard was established for a given product.

We normalized the savings estimates using the population of each state to rank states according to per-capita energy savings. We scored in 0.5-point increments up to a maximum of 3.0 points.

Table 40 shows the scoring breakdown for state standards.

Table 40. Scoring of savings from state appliance standards and clean lighting policies

Energy savings from state standards and clean lighting through 2035 (MMBtus/capita)	Score
>30	3
20–29.99	2.5
15–19.99	2
10–14.99	1.5
5–9.99	1
0.1–4.99	0.5

Table 41 shows the scoring results.

Table 41. Scoring for appliance efficiency standards and clean lighting policies

State	Energy savings from state standards and clean lighting through 2035 (MMBtus/capita)	The year most-recent state standards were adopted	Score (pts.)
California	38.2	2021	3
Vermont	26.6	2022	2.5
Washington	20.8	2022	2.5
Colorado	18.5	2019	2
Nevada	15.9	2021	2
District of Columbia	15.4	2020	2
Oregon	15.1	2021	2
Massachusetts	14.2	2021	1.5
Hawaii	14.0	2019	1.5
Maine	12.2	2022	1.5
New Jersey	11.8	2022	1.5
Rhode Island	8.8	2021	1
Maryland	6.5	2022	1

State	Energy savings from state standards and clean lighting through 2035 (MMBtus/capita)	The year most-recent state standards were adopted	Score (pts.)
New York	4.4	2019	0.5

Leading States

Vermont. In 2018, Vermont led the way for the recent wave of state-level appliance efficiency standards when it adopted standards for 16 products. Since then, 13 other states have followed in Vermont's footsteps. This year Vermont once again led the way on innovative and impactful state action by becoming the first state to adopt a clean lighting policy. This policy ends the sale of general-purpose fluorescent light bulbs, which contain mercury and use twice as much energy as the mercury-free LEDs that replace them.

Washington. In 2019, Washington adopted all state-level appliance efficiency standards recommended by ASAP at that time. Since then, ASAP has recommended new and updated standards for products. This year, Washington adopted standards for three new products and updated standards for three more, strengthening its position as an appliance standards leader.

New York. With the signing of A10439, New York once again became a leader on appliance standards by authorizing the NYSERDA to adopt standards for a wide range of products without returning to the legislature each time. The bill specifically directs NYSERDA to investigate 31 products for standards, with the potential for more to come in the future. Because these standards will not be adopted until after finalization of this *Scorecard*, their savings will begin to be counted in the *2023 Scorecard*.

Chapter 8. Conclusions

The year 2022 revealed a variety of practical policy tools and program designs that are available to state officials to scale up energy savings equitably across multiple use sectors, thus delivering utility bill savings, improved health and safety, and carbon reductions to meet national and state-level climate goals. These programs and policies also continue to provide an important opportunity to support economic recovery from the COVID-19 pandemic as well as to insulate households and businesses from the high energy costs expected this winter (EIA 2022e). This year's *Scorecard* shows that while some states are committed to protecting vulnerable, marginalized communities by incorporating equity into energy efficiency planning and decision-making processes, other states lag behind.

The majority of states we evaluated in the *Scorecard* scored less than half the possible points in the equity categories. Many states can perform better by setting specific energy affordability or justice goals and establishing a dedicated equity task force to engage with marginalized groups. States can also do more to incentivize healthy, affordable, and decarbonized housing through programs that remediate health and safety barriers to weatherization and programs that target affordable housing for zero-energy buildings and electrification. In the transportation sector, states can work to reduce transportation costs for households by ensuring access to transit services for low-income communities and by establishing sustainable funding streams for increased EV adoption in environmental justice communities.

STRATEGIES FOR IMPROVING ENERGY EFFICIENCY

State officials have many policy tools and program designs available to scale up energy savings across multiple use sectors and thereby deliver immense carbon savings to help meet U.S. climate goals. These tools and programs also provide an important opportunity to help reduce home and business energy bills, generate employment, and lessen the need for imported energy fuels. The following list highlights examples of best practices by state policymakers who are 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 that expand participation in programs that achieve savings.

Establish and adequately fund an energy efficiency resource standard (EERS) 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. These policies serve as an enabling framework for cost-effective investment, savings, and program activity. To address evolving priorities such as decarbonization, cost, equity, and grid value, regulators in places such as Massachusetts and New York are adjusting targets to incorporate multiple goals (e.g., fuel-neutral savings) that better align efficiency programs with electrification, GHG reduction objectives, and equitable outcomes.

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 accounts for 27% of the total GHG emissions in the United States and therefore offers a significant opportunity to reduce overall emissions.[56] At the state level, a comprehensive approach to transportation energy efficiency must address both individual vehicles and the entire transportation system. State-level policy options include codifying targets for reducing VMT and integrating land use and transportation planning to create communities in which people have access to multiple modes of travel and need not rely on owning personal vehicles. 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 energy efficiency and clean energy investments and opportunities are inclusive and that benefits accrue to all communities, especially households overburdened by energy costs. Historically marginalized groups have been underserved and underrepresented in clean energy planning and policymaking. States must foster equity in key decision-making processes by ensuring that these efforts are inclusive and designed directly with communities. Efforts to prioritize equity might include establishing internal metrics and frameworks that evaluate the degree to which policy and program outcomes are equitable; developing stakeholder processes and community assessments to better understand the needs of marginalized groups; and adopting inclusive workforce development practices to offer new economic and educational opportunities for groups often underrepresented in the energy efficiency workforce. States can also strengthen incentives and programs for income-qualified customers, and work with utilities and regulators to recognize and value program nonenergy benefits (NEBs)—such as health and economic improvements—as a means of expanding these investments. States, utilities, and PUCs can also include goals specific to low-income communities, either within an EERS or as a stand-alone minimum acceptable threshold, to ensure that investments are targeted toward these customers.

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

[56] EPA. "Sources of Greenhouse Gas Emissions," accessed July 2022. May 2020. epa.gov/ghgemissions/sources-greenhouse-gas-emissions

Adopt updated, energy-efficient building energy codes; improve code compliance; involve efficiency program administrators in code support; and build performance standards. Buildings use almost 40% of the total energy consumed in the United States, making them an essential target for cutting energy waste and emissions.[57] 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 and major renovations. Additional strategies—including BPS for existing buildings, benchmarking and transparency policies, and financing mechanisms such as energy efficiency as a service—can encourage deep retrofits and are also critical for improving efficiency in the existing building stock and reducing building carbon emissions.

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

Expand state-government–led initiatives and make them visible. States can establish annually sustained funding sources for energy efficiency incentive programs and lead by example by incorporating energy efficiency into government activities. Governments can integrate efficiency into their own activities by reducing energy use in public buildings and fleets and by using energy savings performance contracts to finance energy-saving projects. States can also work with utilities and community-based organizations to promote and coordinate 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 up-front 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 implementing 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 Commercial Property Assessed Clean Energy programs and green banks.

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

Adopt cost-effective efficiency standards for appliances, equipment, lighting, and plumbing products. State appliance standards are a proven policy that lowers utility bills

[57] U.S. Energy Information Administration. "How Much Energy Is Consumed in U.S. Buildings?" July 11, 2022. eia.gov/tools/faqs/faq.php?id=86&t=1

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, the Appliance Standards Awareness Project outlined a menu of new or strengthened standards for 47 products that 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.[58]

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

[58] Appliance Standards Awareness Project, *A Powerful Priority: How Appliance Standards Can Help Meet U.S. Climate Goals and Save Consumers Money* (Boston: ASAP, 2020). appliance-standards.org/sites/default/files/Powerful_Priority_Report.pdf.

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Appendix A. Respondents to Utility and State Energy Office Data Requests

State	Primary state energy office data request respondent	Primary public utility commission data request respondent
Alabama	Karl Frost, Energy Efficiency Unit Chief, and Jennifer Lee, Energy Division, Alabama Department of Economic and Community Affairs	—
Alaska	Jimmy Ord, Energy Program Information Manager, Alaska Housing Finance Corp.	—
Arizona	—	Matthew Connolly, Arizona Corporation Commission
Arkansas	Chet Howland, Strategic Energy Initiatives, Arkansas Department of Energy & Environment	Terry Tallent, Arkansas Public Service Commission
Bonneville Power Administration	—	Adam Morse, Bonneville Power Administration
California	Gavin Situ, California Energy Commission	Amy Reardon, Senior Regulatory Analyst, California Public Utilities Commission
Colorado	Dominique Goméz, Deputy Director, Colorado Energy Office	—
Connecticut	Michele Melley, Associate Research Analyst, Connecticut Department of Energy and Environmental Protection	Michele Melley, Associate Research Analyst, Connecticut Department of Energy and Environmental Protection
Delaware	Robert Underwood, Energy Administrator, Delaware Division of Energy & Climate	Robert Underwood, Energy Administrator, Delaware Division of Energy & Climate
District of Columbia	Ben Plotzker, EM&V Project Manager, Vermont Energy Investment Corporation	Ben Plotzker, Manager—Evaluation Process, Vermont Energy Investment Corporation
Florida	Kelley Smith Burk, Director, Office of Energy, Florida Department of Agriculture and Consumer Services	Michael Barrett, Economic Supervisor, Conservation, Florida Public Service Commission
Georgia	Kristofer Anderson, Director of Energy Resources, Georgia Environmental Finance Authority	Jamie Barber, Director, Energy Efficiency and Renewable Energy Unit, Georgia Public Service Commission
Hawaii	Gail Suzuki-Jones, Energy Efficiency & Renewable Energy Buildings Program Manager, Hawaii State Energy Office	Ashley Norman, Research Analyst, Hawaii Public Utilities Commission
Idaho	Alexa Sakolsky-Basquill, Policy Analyst, Idaho Governor's Office of Energy and Mineral Resources	Terri Carlock, Idaho Public Utilities Commission

State	Primary state energy office data request respondent	Primary public utility commission data request respondent
Illinois	—	David Brightwell, Economist, Illinois Commerce Commission
Indiana	Matt Jaworowski, External Affairs Specialist, Indiana Utility Regulatory Commission	—
Iowa	Shelly Peterson, Program Manager, Iowa Economic Development Authority	Donald Tormey, Iowa Utilities Board
Kansas	—	—
Kentucky	—	—
Louisiana	—	—
Maine	Dan Burgess, Director, and Ross Anthony, Buildings and Energy Efficiency Analyst, Governor's Energy Office	Laura Martel, Research and Evaluation Manager, and Lauren Scott, Research and Data Analyst, Efficiency Maine
Maryland	Jenn Gallicchio, Assistant Director of Energy Programs, Maryland Energy Administration	—
Massachusetts	Lyn Huckabee, Regulatory and Innovation Manager, Energy Efficiency Division, Massachusetts Department of Energy Resources	Lyn Huckabee, Regulatory and Innovation Manager, Energy Efficiency Division, Massachusetts Department of Energy Resources
Michigan	Jake Wilkinson, Engineer, Michigan Energy Office	Fawzon Tiwana, Economic Analyst, Michigan Public Service Commission
Minnesota	Adam Zoet, Energy Planner, Director, Minnesota Department of Commerce	Adam Zoet, Energy Planner, Director, Minnesota Department of Commerce
Mississippi	—	Vicki Munn, Electric, Gas & Communications Division, Mississippi Public Utilities Staff
Missouri	Martin Hyman, Senior Energy Analyst, Missouri Department of Natural Resources	Brad Fortson, Manager, Energy Resources Department, Missouri Public Service Commission
Montana	Kyla Maki, Montana Department of Environmental Quality	Michael Dalton, Rate Analyst, Montana Public Service Commission
Nebraska	Sarah Starostka, Planning & Aid Division Administrator, Nebraska Department of Environment and Energy	Sarah Starostka, Planning & Aid Division Administrator, Nebraska Department of Environment and Energy
Nevada	Robin Yochum, Energy Program Manager, Nevada Governor's Office of Energy	Anita Castledine, Economist, Nevada Public Utility Commission
New Hampshire	Alexis LaBrie, Energy Analyst, New Hampshire Department of Energy	Elizabeth Nixon, Electric Director, New Hampshire Department of Energy
New Jersey	Kelly Mooij, Deputy Director, New Jersey Board of Public Utilities	Stacy Richardson, Deputy Director, Division of Clean Energy, New Jersey Board of Public

State	Primary state energy office data request respondent	Primary public utility commission data request respondent
		Utilities
New Mexico	Harold Trujillo, Bureau Chief, Energy Technology and Engineering, New Mexico Energy Office	Christopher Dunn, Public Utilities Economist, New Mexico Public Regulation Commission
New York	Robert Bergen, New York State Energy Research and Development Authority (NYSERDA)	Robert Bergen, New York State Energy Research and Development Authority (NYSERDA)
North Carolina	—	David Williamson, North Carolina Utilities Commission
North Dakota	Bruce Hagen, Weatherization Program Manager, North Dakota Department of Commerce	—
Ohio	Deborah Ohler, Staff Engineer, Division of Industrial Compliance, Ohio Department of Commerce	—
Oklahoma	Bennett Beard, Senior Policy Advisor and Legislative Director, Office of the Secretary of Energy and Environment	Kathy Champion, Regulatory Analyst, Oklahoma Corporation Commission
Oregon	Andy Cameron, Energy Efficiency & Conservation Manager, Oregon Department of Energy	Andy Cameron, Energy Efficiency & Conservation Manager, Oregon Department of Energy
Pennsylvania	Libby Dodson, Energy Program Specialist, Department of Environmental Protection	David Edinger, Pennsylvania Public Utility Commission
Rhode Island	Abigail Hasenfus, Programming Services, Officer Rhode Island Office of Energy Resources	Todd Bianco, Chief Economic and Policy Analyst, Rhode Island Public Utilities Commission
South Carolina	—	Lance Holt, South Carolina Public Service Commission
South Dakota	Chris Gukeisen, State Energy Manager, South Dakota Bureau of Administration	Darren Kearney, Utility Analyst, South Dakota Public Utilities Commission
Tennessee	Mark Finlay, Energy Analyst, Office of Energy Programs, Tennessee Department of Environment and Conservation	Alan Hickson, Tennessee Valley Authority
Texas	—	—
Utah	Claire Baer, Program Specialist, Governor's Office of Energy Development	John Harvey, Economist, Utah Public Service Commission
Vermont	Kelly Launder, Assistant Director, and Barry Murphy, Energy Efficiency Program Specialist, Vermont Public Service Department	Kelly Launder, Assistant Director, and Barry Murphy, Energy Efficiency Program Specialist, Vermont Public Service Department

State	Primary state energy office data request respondent	Primary public utility commission data request respondent
Virginia	Bettina Bergoo, Division of Renewable Energy and Energy Efficiency, Virginia Department of Energy.	—
Washington	Emily Salzberg, Managing Director, Building Standards and Performance, Washington State Department of Commerce	Heather Moline, Regulatory Analyst, Conservation and Energy Planning, Washington Utilities and Transportation Commission
West Virginia	Garrett Weaver, West Virginia Division of Energy	Karen Hall, Public Information Specialist, Public Service Commission of West Virginia
Wisconsin	—	Joe Pater, Director, Office of Energy Innovation, Public Service Commission of Wisconsin
Wyoming	Kaeci Daniels, Wyoming Energy Authority	—

Appendix B. Calculating Utility Energy Efficiency Savings and Spending

In the following, we offer additional details on our approach to scoring states in Chapter 2, "Utility and Public Benefits Programs and Policies," focusing specifically on categories relating to savings achieved from utility energy efficiency programs. For this chapter, we gathered a range of quantitative program data and policy information concerning utilities, as the following table summarizes.

Table B-1. Utility chapter data collection and sources

Data category	Source
Utility energy sales (electricity and natural gas) and consumption data for other fuels (kerosene, propane, fuel oil, wood) in 2020 and 2021	EIA-861, State Energy Data System (SEDS)
Utility revenues from retail energy sales in 2020 and 2021	EIA-861
Number of residential natural gas customers in 2021	EIA—Natural Gas
Actual spending for electricity and natural gas energy efficiency programs in 2020 and 2021	ACEEE Utility Regulatory Staff Data Request
Incremental net and gross electricity and natural gas energy efficiency program savings in 2020 and 2021[59]	ACEEE Utility Regulatory Staff Data Request
Incremental net and gross energy savings of unregulated fuels including fuel oil, kerosene, wood, and propane, where available, in 2020 and 2021	ACEEE Utility Regulatory Staff Data Request
Policies and regulations to encourage utility investment in energy efficiency	ACEEE Utility Regulatory Staff Data Request
Policies and levels of spending related to utility investment in low-income energy efficiency programs	ACEEE Utility Regulatory Staff Data Request
Inclusion of health and safety benefits within energy efficiency	ACEEE Utility Regulatory

[59] Gross savings are those expected from an energy efficiency program, crediting all installed efficiency measures, including those that would have been installed in the absence of the program. Net savings are those attributable to the program, typically estimated by subtracting savings from free riders (program participants who would have implemented or installed the measures without the incentive, or with a lesser incentive), and adding in estimates of savings from free drivers (program nonparticipants who implemented or installed the measures due to the program). States differ in how they define, measure, and account for free ridership and other components of the net savings calculation (Haeri and Khawaja 2012).

Data category	Source
cost-effectiveness testing	Staff Data Request, NSPM
Utility program metrics, tracking indicators, and geographic mapping efforts that measure equitable distribution of efficiency benefits	ACEEE Utility Regulatory Staff Data Request
Intervenor compensation provided by states or utilities for individual or community group involvement in state utility regulatory proceedings	ACEEE Utility Regulatory Staff Data Request, NARUC (2021)

As table B-1 shows, we sourced our data from information requests completed by state utility commissions and from the EIA. We also referred to additional studies and resources to validate or confirm data received through our information request. These included The National Standard Practice Manual's Database of Screening Practices (DSP), NARUC's *State Approaches to Intervenor Compensation* (2021), and annual utility demand-side management reports. We sent the data we gathered, along with last year's *State Scorecard* data, to state utility commissions and independent administrators for review. Table 7 shows overall scores for utility programs and policies.

Calculations of Statewide Utility Electricity Savings

Table 9 shows data on electricity energy efficiency program savings in the most recent years for which data were available.

We report 2021 statewide net energy efficiency savings based on responses received from our *Data Request to Utility Regulatory Staff*, normalized by 2021 statewide electricity sales data from EIA-861.

Thirty-six states and the District of Columbia completed some or all of our data request form. If no data were provided by state respondents for 2021, we used the most recent savings data obtainable—either state-reported 2020 savings from the *2020 State Scorecard Progress Report* or EIA information (2022b).

States use different methodologies for estimating energy savings, and this can produce inequities when making comparisons (Sciortino et al. 2011). A state's EM&V process plays a key role in determining how savings are quantified and can vary significantly in terms of approach, data assumptions, and analytical rigor. This is particularly true of a state's treatment of free ridership (that is, savings attributed to a program that would have occurred even without 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 free drivers, and gross savings not accounting for either of these.[60] The *State Scorecard* specifically focuses on net savings.

In a national survey of evaluation practices, ACEEE researchers found that, of the 42 states responding, 8 reported gross savings, 16 reported net, and 18 reported both (York, Cohn, and Kushler 2020). These findings further highlight discrepancies among states regarding calculations of electric program savings data. Different states and utilities may define net savings in different ways and adopt different calculation methods.

A number of states report only gross savings and do not estimate or report net savings. In these cases, in an effort to provide a fair comparison of savings for scoring, we applied a standard factor of 0.809 to convert gross savings to net savings (a net-to-gross, or NTG, ratio). This NTG factor was derived based on the median NTG value among states that reported figures for both net and gross natural gas savings in this year's data request. Those states were California, Connecticut, Delaware, Georgia, Maryland, Massachusetts, Missouri, Montana, New Mexico, New York, Tennessee, Utah, and Virginia.

Calculations of Statewide Utility Savings from Natural Gas and Unregulated Fuels Efficiency Programs

Table 11 provides data on statewide savings from energy efficiency programs addressing natural gas and unregulated fuels in the most recent years for which data were available.

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. 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.

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

[60] Free drivers are utility customers who install energy efficiency measures as a result of a program but are not themselves participants in the energy efficiency program.

fuel type from the EIA State Energy Data System (SED), expressed in Btus. We then converted all natural gas savings data from MMtherms to MMBtus (1 therm = 100,000 Btu) and divided savings by residential and commercial sales to create the common metric. We continue our approach of excluding industrial sales and consumption in our calculations of savings as a percentage of sales given that industrial volumes can vary wildly by region and can be seen as penalizing some states based on the profile or prominence of particular industrial/manufacturing sector residing there.

Similar to our methodology for scoring electric savings, we applied a standard factor of 0.9056 to convert gross savings to net savings (an NTG ratio). We derived this NTG factor based on the median NTG value among those states that reported figures for both net and gross natural gas savings in this year's data request—that is, California, Connecticut, Maryland, Massachusetts, Montana, New Mexico, New York, and Wisconsin.

Calculations of Statewide Spending on Utility Energy Efficiency Programs

Table 12 provides data on statewide spending on electricity energy efficiency programs.

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 DOE's Weatherization Assistance Program. We did include revenues from the Regional Greenhouse Gas Initiative (RGGI), which contributes to customer-funded energy efficiency program portfolios of member states and to energy efficiency programs funded through AB 32 and Proposition 39 in California.[61] Where RGGI funds were channeled to energy efficiency initiatives implemented by state governments, we included them in Chapter 5, "State Government–Led Initiatives."

For states that did not provide data for 2021 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.

Spending data are subject to variation across states, and this poses an ongoing challenge to our efforts to equitably score states based on a common and reliable metric. Several states report performance incentives paid to utilities or other program administrators as part of utility efficiency program spending, resulting in higher spending numbers. While most

[61] 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.

performance incentives are based on shared net benefits—viewed as an expense—the relative amounts of the incentives are in the range of 5–15% of program spending (Nowak et al. 2015). For this reason, we asked states to disaggregate program spending from these incentives. We did not credit this spending in our scoring in an effort to more accurately reflect funds directly dedicated to energy efficiency measures. As in past years, we sent spending data gathered from the above sources to state utility commissions for review.

Calculations of Statewide Spending on Utility Natural Gas Efficiency Programs

Table 13 provides data on statewide spending on natural gas energy efficiency programs in the most recent years for which data were available.

To directly compare spending data among the states, we normalized spending by the number of residential natural gas customers in each state in 2020, as reported by EIA (2022d). While we would prefer to normalize based on statewide sales revenues, these data are not available.

Additional Notes

Some metrics were not used in our scoring. For instance, we did not attempt to include program cost effectiveness or level of spending per unit of energy savings. All states have cost-effectiveness requirements for energy efficiency programs (York, Cohn, and Kushler 2020). However, the wide diversity of measurement approaches across states makes comparison less than straightforward. Also, several states require program administrators to pursue all cost-effective efficiency. Although some states have prioritized low acquisition costs and encouraged maximizing the degree of cost effectiveness, promoting larger amounts of marginally cost-effective energy savings is also another valid approach. We also did not adjust savings for variations in avoided costs of energy across states, as there are examples of achieving deep energy savings in both high- and low-cost states.

Appendix C. State Efficiency Spending and Savings Targets for Low-Income Customers

State	Spending/Savings requirements for low-income energy efficiency programs
California	California Public Utilities Code Section 382(e) set a goal to provide low-income energy efficiency measures to 100% of eligible and willing customers by 2020. A. 14-11-007 (2016) strengthened the goal and updated interpretation of the "willing and feasible to participate" factor.
Colorado	HB 21-1238, requiring gas utilities to develop energy savings targets every four years, includes a requirement that 25% of residential DSM programs target low-income households.
Connecticut	Utilities are required to allocate their limited-income budget in parity with the revenues expected to be collected from that sector. Public Act 11-80, Section 33, establishes a goal of weatherizing 80% of homes. This goal is not specific to low-income customers, but activity in the low-income program helps the companies achieve this goal. Connecticut's utilities are required to allocate their limited-income budgets in parity with the revenues that are expected to be collected from that sector. As part of their Performance Management Incentive (PMI) calculation, the electric and natural gas utilities are required to spend a percentage of the HES-Income Eligible program budget. Additionally, the HES-Income Eligible program has electric, natural gas, oil, and propane savings metrics that must be met prior to the utilities receiving their PMI.
Delaware	Delaware established legislative energy savings targets in 2009 with the adoption of SB 106, which set up a Sustainable Energy Trust Fund to collect charges assessed by energy providers in service of energy savings goals. SB 106 specifies that 20% of assessments be provided to the Weatherization Assistance Program. The Delaware Weatherization Assistance Program has an annual goal of completing 400 homes. Electric utility restructuring legislation passed in 1999 specified that Delmarva Power and Light (DPL) collect 0.095 mills per kWh (approximately $800,000 annually) from customers to be forwarded to the Department of Health and Social Services, Division of State Service Centers, to be used to fund low-income fuel assistance and weatherization programs. In addition, Energize Delaware was selected to facilitate and disburse $4 million in funds designated for low-income energy-efficient programs for Delmarva Power customers. These funds originated from the Exelon\Delmarva Power Merger Settlement approved by the Delaware Public Service Commission in 2018. Energize Delaware will distribute the funds competitively to organizations capable of delivering energy efficiency programs to low-income customers over a three-year period. Two distinct energy efficiency programs will be funded: Large-Scale energy efficiency programs and Community-Scale programs.
District of Columbia	The Clean and Affordable Energy Act (CAEA) of 2008 established a separate Energy Assistance Trust Fund to support: "(1) the existing low-income programs in the amount of $3.3 million annually; and (2) the Residential Aid Discount subsidy in the

State	Spending/Savings requirements for low-income energy efficiency programs
	amount of $3 million annually." For the 2017–21 program cycle the low-income spending requirement was adjusted to 20% of expenditures.
Illinois	In September 2020, Illinois signed the Climate and Equitable Jobs Act (SB 2408), which includes multiple provisions supporting equity and low-income customers. The legislation raises minimum spending for low-income programming from $8.35 million to $13 million for Ameren and from $25 million to $40 million for ComEd. CEJA also requires electric utilities to implement a health and safety fund of at least 15% of the total low-income weatherization budget.
Maine	LD-1559, passed in June 2013, states that Efficiency Maine Trust shall "target at least 10% of funds for electricity conservation collected under subsection 4 or 4-A or $2,600,000, whichever is greater, to programs for low-income residential consumers, as defined by the board by rule." For the Natural Gas Conservation Fund (natural gas ratepayer funds), this allocation is set at a reasonable percentage considering low-income consumers' share of gas load and the cost-effective opportunity available in their homes, which in practice Efficiency Maine has set at 10%. Regarding RGGI funds usage, the statute requires that Efficiency Maine "shall ensure that measures to reduce the cost of residential heating are available for low-income households …" and Efficiency Maine allocates a minimum of 10% to low-income initiatives (35-A MRS §10109(4)(A)). Following the passage of LD 1766 in 2019 and its establishment of a statewide goal to install 100,000 high-performance heat pumps by 2025, MaineHousing allocated a portion of its annual LIHEAP weatherization budgets to pay for the installation of 1,000 heat pumps per year in LIHEAP-eligible homes. In 2021, the legislature passed LD 1766, codifying the state's plan (the Maine Jobs and Recovery Plan) to spend roughly $1 billion in discretionary funding from the American Rescue Plan Act (ARPA) Coronavirus State and Local Fiscal Recovery Funds. This plan allocated $25 million to the Efficiency Maine Trust to accelerate weatherization and efficiency upgrades for homes in the state, especially for low-income, older residents, and renters.
Massachusetts	In the late 1990s, Massachusetts restructuring law established a low-income conservation fund through a 0.25 mills per kWh charge on every electric customer's bill. A conservation charge on natural gas customers' bills has funded natural gas low-income energy efficiency programs. In 2010, the program received additional funding through the 2008 Green Communities Act, which required that 10% of electric utility program funds and 20% of gas program funds be spent on comprehensive low-income energy efficiency and education programs. The legislation further directed that these programs be implemented through the low-income weatherization assistance program (WAP) and fuel assistance program network with the objective of standardizing implementation among all utilities. In addition to the WAP-coordinated programs that directly serve low-income clients, the utilities fund the Low-Income Multifamily Retrofit Program, which provides cost-effective energy efficiency improvements to multifamily buildings, including those

State	Spending/Savings requirements for low-income energy efficiency programs
	owned by nonprofit and public housing authorities. The program is aimed at one- to four-unit residential buildings where at least 50% of the units are occupied by low-income residents earning at or below 60% of area median income. Eligible projects involve efficiency upgrades for buildings with currently high energy consumption, specifically for space heating, hot water, air sealing, and insulation of building envelopes, lighting, and appliances.
Michigan	SB 438, approved in December 2016, extended the state's 1% annual energy savings requirement for utilities through 2021. The bill does not specify a minimum required level of spending or savings for low-income energy efficiency programs, other than to direct that distribution customers' funding responsibilities for low-income residential programs be proportionate to the distribution customers' funding of the total energy optimization (EO) program: "The established funding level for low-income residential programs shall be provided from each customer rate class in proportion to that customer rate class's funding of the provider's total energy optimization programs."
Minnesota	To help ensure that low-income customers have the opportunity to participate in the Conservation Incentive Program (CIP), Minnesota Statutes §216B.241, subd. 7(a) establishes minimum low-income spending requirements for electric and natural gas utilities and associations. The 2021 Energy Conservation and Optimization Act (ECO) contains many changes and updates to CIP, including more than doubling the low-income spending requirement for all IOUs. Beginning in 2022, the minimum low-income spending requirement for gas investor-owned utilities will be equal to 1% of three-year average residential gross operating revenue (GOR). The minimum low-income spending requirement for electric investor-owned utilities will be equal to 0.4% of three-year average residential GOR beginning in 2022; then, it will increase to 0.6% of residential GOR beginning in 2024.
Montana	SB 150, passed in 2015, made changes to the state's system benefit fund, increasing a public utility's minimum funding level for low-income energy and weatherization assistance from 17% to 50% of the public utility's annual electric universal systems benefits (USB) level. A cooperative utility's minimum annual funding requirement for low-income energy assistance remains at 17% of its annual USB funding level. SB 150 also clarified that eligible projects can be located on tribal reservations.
Nevada	In June 2017, SB 150 was signed into law, which, in addition to directing the Public Utilities Commission of Nevada to establish annual energy savings goals for NV Energy, also requires utilities to set aside a minimum 5% of efficiency program budget for low-income customers. SB 448 (2021) amended the low-income budget requirement to 10% of the total of efficiency program expenditures. Those funds must be spent on energy efficiency measures for customers in low-income households and residential customers and public schools in historically underserved communities, through both targeted programs and programs directed at residential customers and public schools in general.
New Hampshire	Per Settlement Agreement, the Home Energy Assistance Program's budget is 17% of the total plan budget. Any unused monies in the HEA program carry forward to the next year. In addition, RSA 374-F:3, VI-a (c), as amended on February 24, 2022

State	Spending/Savings requirements for low-income energy efficiency programs
	(HB549), provides "that no less than 20 percent of the portion of the [system benefit charge] funds collected for energy efficiency shall be expended on low-income energy efficiency programs." The 20% requirement is specific to the electric utilities.
New Jersey	The state's low-income energy efficiency program, New Jersey Comfort Partners, arose out of 1999 restructuring legislation that designated a systems benefit charge as the funding source for energy efficiency programs (EDECA). A low-income program is required as set forth in EDECA at N.J.S.A. 48:3-61. The NJBPU has approved a low-income energy efficiency program since 2001. There are no specific levels of required of spending, although each year the program budget does specify annual goals for number of customers served. For FY20, the NJBPU has also proposed an increase in the income eligibility limits, from 225% of Federal Poverty Guidelines to 250% of Federal Poverty Guidelines in order to expand the program's availability and increase access for residents of New Jersey. Annual goals for energy savings and the number of customers served are established in the program filings. In 2021, NJ's Clean Energy Program (NJCEP) completed the transition of the administration of certain energy efficiency programs from NJCEP to the investor-owned utilities in accordance with the mandates from the Clean Energy Act of 2018. These new programs allow the utilities to work directly with customers to achieve energy savings. The EE transition framework has been designed to ensure that low- and moderate-income communities share the same level of access to the benefits associated with EE investments as wealthier communities do. Part of this includes the utilities and state continuing to co-manage the low-income program offerings through the Comfort Partners program. Utility residential programs also include enhanced incentives and features for low-income customers to access prescriptive EE incentives and products, as well as more favorable financing terms.
New Mexico	The state's energy efficiency targets, established in 2005 within the Efficient Use of Energy Act, were amended in 2019 with the passage of HB 291. The legislation calls for a 5% reduction of energy consumption as a percentage of 2020 sales by 2025 and also directs that no less than 5% of the amount received by the public utility for program costs shall be specifically directed to energy efficiency programs for low-income customers.
New York	In December 2018, the PSC ordered the development of a Statewide Low- and Moderate-Income (LMI) Portfolio, to include ratepayer funded initiatives administered by NYSERDA and the utilities. The order also required that a minimum of 20% of any additional energy efficiency investments through the utilities be directed to the LMI market segment. In January 2020, the PSC authorized utility specific LMI budgets, totaling a minimum of $289 million through 2025. Combined with the NYSERDA ratepayer funded LMI budget, the LMI Portfolio will include at least $650 million of new investments in LMI energy efficiency through 2025.
Oklahoma	Under OAC 165:35-41-4, all electric utilities under rate regulation of the Oklahoma Corporation Commission must propose, at least once every three years—and be responsible for the administration and implementation of—a demand portfolio of energy efficiency and demand response programs within their service territories. The

State	Spending/Savings requirements for low-income energy efficiency programs
	regulations specify that demand portfolios must address programs for low-income and hard-to-reach customers "to assure proportionate Demand Programs are deployed in these customer groups despite higher barriers to energy efficiency investments."
Oregon	HB 3141, signed in 2021, increased to 3% the annual expenditures of revenues required of investor-owned utilities for funding "Public Purposes," including energy efficiency, development of new renewable energy, and low-income weatherization. Per the legislation, 13% of the public purpose charge would be allocated to low-income weatherization through the Energy Conservation Helping Oregonians (ECHO) program.
Pennsylvania	In June 2020, the Pennsylvania Public Utility Commission issued an implementation order for Phase IV of the Energy Efficiency and Conservation (EE&C) Program, setting five-year cumulative targets of 4.5 million MWh, equivalent to about 0.62% of incremental savings per year through 2026. The order also requires each utility to obtain a minimum of 5.8% of their total consumption reduction target from the low-income sector.
Texas	As amended by SB 1434 in June 2011, Substantive Rule § 25.181 states that "each utility shall ensure that annual expenditures for the targeted low-income energy efficiency program are not less than 10% of the utility's energy efficiency budget for the program year."
Vermont	Efficiency Vermont (EVT), the state's energy efficiency utility established in 1999, is funded through a systems benefits charge on all utility customers' bills. Most of the costs of the electric efficiency measures implemented by EVT and the community-based weatherization agencies are paid for by EVT, with any remaining balances covered by the federal Weatherization Assistance Program (WAP). Other funding for WAP comes from the state's Weatherization Trust Fund, which was created in 1990 through legislative enactment of a gross-receipts tax of 0.5% on all non-transportation fuels sold in the state. As specified by Vermont law, 50% of the net proceeds from the sale of carbon credits through the RGGI are deposited into a fuel efficiency fund to provide energy efficiency services to residential consumers who have incomes of no more than 80% of the state median income.
Virginia	The 2018 Grid Modernization and Security Act (SB966) required that at least 5% of energy efficiency programs benefit low-income, elderly, and disabled individuals. The 2020 Virginia Clean Economy Act increased this target to 15%.

Appendix D. Cost-Effectiveness Rules for Utility Low-Income Efficiency Programs

State	Special cost-effectiveness provisions for low-income energy efficiency programs
Arizona	Since 2011, Arizona Administrative Code Title 14, Chapter 2, Article 24 (R14-2-2412) has directed that "an affected utility's low-income customer program portfolio shall be cost effective, but costs attributable to necessary health and safety measures shall not be used in the calculation."
Arkansas	Arkansas does not require program-level cost effectiveness for low-income programs.
California	California applies the Energy Savings Assistance Program Cost Effectiveness test (ESACET) and the Total Resource Cost (TRC) test to its low-income program. These tests incorporate nonenergy benefits and are used for informational purposes only, with no set minimum threshold for cost effectiveness.
Colorado	Decision No. C08-0560 directs the Colorado Public Service Commission to pursue all cost-effective low-income demand-side management (DSM) programs, "but to not forgo DSM programs simply because they do not pass a 1.0 TRC test." It also directs that, in applying the TRC to low-income DSM programs, "the benefits included in the calculation shall be increased by 20%, to reflect the higher level of nonenergy benefits that are likely to accrue from DSM services to low-income customers." This was increased to 50% for low-income measures and products in April 2018 under Decision No. C18-0417. To avoid unintended impacts to calculations of benefits pursuant to performance incentives, the decision also allows utilities to exclude these costs in these determinations: "To address this concern we find that the costs and benefits associated with any low-income DSM program that is approved and has a TRC below 1.0 may be excluded from the calculation of net economic benefits. Further, the energy and demand savings may be applied toward the calculation of overall energy and demand savings, for purposes of determining progress toward annual goals."
Connecticut	Connecticut has established formal rules and procedures for evaluation, which are stated in Public Act 11-80 and Evaluation Rules and Roadmap. The Program Administrator test has been the primary cost-effectiveness test in Connecticut. However, the TRC test is the primary test for the Home Energy Solutions Limited-Income program. Connecticut regulators have repeatedly approved non-cost-effective low-income programs.
Delaware	The Evaluation, Measurement, and Verification Committee in 2016 recommended specific net-energy impacts or net-energy benefits for low-income programs. These include weatherization-reduced arrearages and participant health and safety benefits. Specific values were also applied to the net-energy benefits and are locked in for three years. These net-energy benefits were unanimously recognized and approved by the Energy Efficiency Advisory Council.

State	Special cost-effectiveness provisions for low-income energy efficiency programs
District of Columbia	While no specific rules are in place for low-income programs per se, programs that are not cost effective may be included in the DC Sustainable Energy Utility's portfolio as long as the overall portfolio is cost effective based on the Societal Cost test. A 10% adder is applied to program benefits to account for additional nonenergy benefits including comfort, noise reduction, aesthetics, health and safety, ease of selling/leasing the home or building, improved occupant productivity, fewer work absences due to reduced illnesses, ability to stay in one's home and avoid moves, and macroeconomic benefits.
Florida	Applying program-level cost-effectiveness tests to low-income energy efficiency programs is not required by the energy efficiency statutes in Florida.
Idaho	In April 2013, the PUC largely adopted its staff's recommendations from an October 2012 report regarding methodology for evaluating low-income weatherization assistance programs (LIWAP) and the criteria for increased funding (Order No. 32788, Case No. GNR-E-12-01). In this order, the PUC determined that a utility may "include a 10% conservation preference adder for their low-income weatherization programs," but that if the utility believes the adder would make its cost-effectiveness calculations inconsistent, then the company need not use the adder. The PUC encouraged the utilities to include nonenergy benefits of LIWAPs when calculating cost effectiveness but declined to construct a "specific cost-effectiveness test for low-income programs at this time." Instead, the PUC said it would continue reviewing LIWAPs on a case-by-case basis.
Illinois	Section 8-103B (Energy Efficiency and Demand-Response Measures) of SB 2814 excludes low-income energy efficiency measures from the need to satisfy the TRC test.
Indiana	Under Senate Bill 412 and Indiana Code 8-1-8.5-10(h), an electricity supplier may submit its energy efficiency plan to the commission for a determination of the overall reasonableness of the plan either as part of a general basic rate proceeding or as an independent proceeding. A petition submitted may include a home energy efficiency assistance program for qualified customers of the electricity supplier regardless of whether the program is cost effective.
Iowa	According to IAC 199–35.5(4)(c)(3), "Low-income and tree-planting programs shall not be tested for cost effectiveness, unless the utility wishes to present the results of cost-effectiveness tests for informational purposes."
Kansas	Low-income programs are not required to pass strict benefit–cost analysis so long as they are found to be in the public interest and supported by a reasonable budget.
Kentucky	Requirements for low-income programming are similar to those governing other programmatic offerings, which were established by precedent in a 1997 proceeding surrounding the approval of LG&E's DSM program portfolio. The rules for benefit–cost tests are stated in Case No. 1997-083. These benefit–cost tests are required for total program-level screening, with exceptions for low-income programs, pilots, and new technologies. The commission also found in Case No. 97-083 that "If [a] filing fails any of the traditional [cost-effectiveness] tests, LG&E and its Collaborative may submit additional documentation to justify the need for the program."

State	Special cost-effectiveness provisions for low-income energy efficiency programs
Maine	Maine has not had specific cost-effectiveness guidelines in place for low-income programs. However, the cost-effectiveness test for all programs provides for consideration of nonenergy benefits including "reduced operations and maintenance costs, job training opportunities and workforce development, general economic development and environmental benefits, to the extent that such benefits can be accurately and reasonably quantified and attributed to the program or project."
Maryland	In Order No. 87082, the PUC required cost-effectiveness screening for limited-income programs but indicated the programs may still be implemented without satisfying the test, stating: "We accept the recommendation of the Coalition that, while cost-effectiveness screening of the limited income sub-portfolio shall be required in the same manner as with respect to the other EmPOWER sub-portfolios, the results of the limited-income sub-portfolio screening shall serve as a point of comparison to other jurisdictions and past programmatic performance rather than as the basis for precluding certain limited-income program offerings."
Massachusetts	Massachusetts relies on the TRC test as its primary test for DSM programs but specifically calculates additional benefits from low-income programs in its benefit–cost ratio. DPU 08-50-B specifies that an energy efficiency plan must include calculations of non-electric benefits, specifically those related to: "(A) reduced costs for operation and maintenance associated with efficient equipment or practices; (B) the value of longer equipment replacement cycles and/or productivity improvements associated with efficient equipment; (C) reduced environmental and safety costs, such as those for changes in a waste stream or disposal of lamp ballasts or ozone-depleting chemicals; and (D) all benefits associated with providing energy efficiency services to Low-Income Customers." In 2010, in its 2010–12 Three-Year Plan Order, the Massachusetts Department of Public Utilities (DPU) ordered the program administrators to conduct a more thorough analysis of nonenergy impacts through evaluation studies. The DPU, with few exceptions, approved these studies. A study for the Massachusetts program administrators, conducted by NMR Group, incorporates findings from a review of the nonenergy impacts literature to quantify nonenergy benefits, including those for low-income programs.
Michigan	Sec. 71 (4)(g) of SB 438 appears to exempt low-income programs from demonstrating cost effectiveness. To demonstrate that the provider's energy waste reduction programs, excluding program offerings to low-income residential customers, will collectively be cost effective, SB 438 states: "An energy waste reduction plan shall … demonstrate that the provider's energy waste reduction programs, excluding program offerings to low-income residential customers, will collectively be cost effective."
Minnesota	The rules for benefit–cost tests are stated in MN Statutes 261B.241 and Rule 7690.0550. The benefit–cost tests are required for portfolio, total program, and customer project-level screening with exceptions for low-income programs. Subd 7(e) of 216B.241 directs that "costs and benefits associated with any approved low-

State	Special cost-effectiveness provisions for low-income energy efficiency programs
	income gas or electric conservation improvement program that is not cost effective when considering the costs and benefits to the utility may, at the discretion of the utility, be excluded from the calculation of net economic benefits for purposes of calculating the financial incentive to the utility. The energy and demand savings may, at the discretion of the utility, be applied toward the calculation of overall portfolio energy and demand savings for purposes of determining progress toward annual goals and in the financial incentive mechanism."
Mississippi	Mississippi does not require program-level cost effectiveness for low-income programs.
Montana	Montana specifies the TRC as its primary test for decision-making. The benefit–cost tests are required for the individual measure level for program screening, but there are exceptions for low-income programs, pilots, and new technologies.
Nevada	Nevada Housing Division for programs of energy conservation, weatherization, and energy efficiency for eligible households does not require a cost–benefit analysis. Legislation in 2017 established that low-income programs do not have to pass cost-effectiveness screening as long as the portfolio of all DSM programs passes. Also, a nonenergy benefits adder of 25% is applied to low-income programs. Regular programs receive a 10% adder. Depending on the percentage of low-income participation in a program, the nonenergy benefits adder is adjusted using a weighted average formula.
New Hampshire	With respect to nonenergy benefits for low-income programs, as noted in Order No. 23,574, both low-income programs and educational programs could still be approved by the commission even if they do not surpass a 1.0 benefit–cost ratio given their additional hard-to-quantify benefits.
New Jersey	Implementation of a low-income energy efficiency program is required by New Jersey statute N.J.S.A. 48:3-61. In 2020, the Board of Public Utilities approved the New Jersey Cost Test, which includes a 10% adder for low-income benefits.
New Mexico	The Utility Cost test (UCT) is conducted in New Mexico and is considered the primary test for decision-making and evaluating program cost effectiveness. HB 267 directs that "In developing this test for energy efficiency and load management programs directed to low-income customers, the commission shall either quantify or assign a reasonable value to reductions in working capital, reduced collection costs, lower bad-debt expense, improved customer service effectiveness and other appropriate factors as utility system economic benefits." It was later codified in New Mexico Administrative Code that "In developing the Utility Cost test for energy efficiency and load management measures and programs directed to low-income customers, unless otherwise quantified in a commission proceeding, the public utility shall assume that 20% of the calculated energy savings is the reasonable value of reductions in working capital, reduced collection costs, lower bad-debt expense, improved customer service, effectiveness, and other appropriate factors qualifying as utility system economic benefits" [17.7.2.9 NMAC–Rp. 17.7.2.9 NMAC, 1-1-15].
New York	New York screens programs at the measure level and requires each to have a TRC

State	Special cost-effectiveness provisions for low-income energy efficiency programs
	score of at least 1.0, with some exceptions. It appears that New York's TRC test does not explicitly address nonenergy benefits of low-income programs. However, the New York Public Service Commission (PSC) has generally recognized and considered low-income-specific benefits in deciding on funding for utility low-income programs. For example, in a 2010 order, the commission approved a low-income program with a TRC ratio of 0.91, finding that "As a general principle, all customers should have reasonable opportunities to participate in and benefit from Energy Efficiency Portfolio Standard (EEPS) programs. It is also important that supplemental funding be provided to address gas efficiency measures in this program."
North Carolina	North Carolina's low-income programs are generally not required to meet cost-effectiveness thresholds in order for utilities to provide energy efficiency programs to a sector of the population that would likely not otherwise participate in energy efficiency.
Oklahoma	Oklahoma Administrative Code (OAC) 165:35-41-4 directs that demand programs targeted to low-income or hard-to-reach customers may have lower threshold cost-effectiveness results than other efficiency programs.
Oregon	The rules for benefit–cost tests are stated in Docket UM 551, Order 94-590, which lays out a number of situations in which the PUC may make exceptions to the standard societal test calculation. Order 15-200, signed June 23, 2015, concerns Idaho Power Company's request for cost-effectiveness exceptions to its DSM programs. The commission adopted the recommendation of staff that cost-effectiveness requirements in Order 95-590 do not apply to low-income weatherization programs, such as the Weatherization Assistance for Qualified Customers Program.
Pennsylvania	In Order M-2015-2468992, the PUC specifies 2016 Total Resource Cost test requirements. Pennsylvania relies on the TRC test and considers it to be its primary cost-effectiveness test. A benefit–cost test is required for portfolio-level screening. The commission requires that the electric distribution companies provide benefit and cost data for both low-income and non-low-income residential program savings in their annual reports and that TRC tests be applied to all low-income programs and all residential programs. However, the commission does not require a separate PA TRC test calculation for the low-income sector.
South Carolina	South Carolina does not require program-level cost effectiveness for low-income programs.
Texas	In an order adopted September 28, 2012, the commission directed that low-income programs would not be required to meet the cost-effectiveness standard in Substantive Rule § 25.181, but rather would need to only meet standards required by the savings-to-investment ratio (SIR) methodology. All measures with an SIR of 1.0 or greater qualify for installation. The SIR is the ratio of the present value of a customer's estimated lifetime electricity cost savings from energy efficiency measures to the present value of the installation costs, inclusive of any incidental repairs, of those energy efficiency measures.
Utah	The rules for benefit–cost tests are stated in Docket No. 09-035-27. Utah uses the TRC test, Utility Cost test (UCT), Participant Cost test (PCT), and Ratepayer Impact

State	Special cost-effectiveness provisions for low-income energy efficiency programs
	Measure (RIM). Approval of individual DSM programs or portfolios of programs should be based on an overall determination that the program or portfolio is in the public interest after consideration of all four tests and the passage of the threshold test, the UCT. Utah also utilizes the PacifiCorp TRC (PTRC) test, which follows the Northwest convention of adding 10% to the avoided costs to account for unquantified environmental and transmission and distribution impacts.
Vermont	Vermont specifies the Societal Cost test to be its primary test for decision-making. A 15% adjustment is applied to the cost-effectiveness screening tool for low-income customer programs.
Virginia	Virginia does not require program-level cost effectiveness for low-income programs.
Washington	Per WAC 480-109-100, low-income weatherization is not included in the portfolio or sector-level cost-effectiveness analysis. Companies may implement low-income programs that have a TRC ratio of 0.67 or above. The rules for benefit–cost tests are directed by the Energy Independence Act of 2006, codified in Chapter 194-37 WAC, which specifies that the TRC test include all nonenergy impacts that a resource or measure may provide that can be quantified and monetized. Washington also applies an additional 10% benefit to account for non-quantifiable externalities, consistent with the Northwest Power Act. In Docket UE-131723, signed March 12, 2015, the commission revised the rule language to allow, rather than require, utilities to pursue low-income conservation that is cost effective consistent with the procedures of the Weatherization Manual finding that "in recognition that low-income conservation programs have significant nonenergy benefits, we find it appropriate for utilities to maintain robust low-income conservation offerings despite the unique barriers these programs face."
Wisconsin	Administrative code requires programs for residential and nonresidential program portfolios to each pass portfolio-level cost effectiveness. One of the established reasons for setting portfolio-level testing rather than program- or measure-level testing is to provide more flexibility for low-income programs.

Appendix E. State Electric Vehicle (EV) Fees

State	EV fee	Average gasoline tax collected for gasoline vehicles	Ratio of EV fee to gas tax revenues
Alabama	$200	$80.03	2.50
Alaska	–	$27.81	–
Arizona	–	$75.09	–
Arkansas	$200	$87.16	2.29
California	$100	$181.33	0.55
Colorado	$50	$89.30	0.56
Connecticut	–	$103.95	–
Delaware	–	$113.50	–
District of Columbia	–	$101.99	–
Florida	–	$79.03	–
Georgia	$213	$124.17	1.71
Hawaii	$50	$72.70	0.69
Idaho	$140	$132.31	1.06
Illinois	$100	$81.25	1.23
Indiana	$150	$122.98	1.22
Iowa	$65	$133.20	0.49
Kansas	$100	$99.29	1.01
Kentucky	–	$122.77	–
Louisiana	–	$92.08	–
Maine	–	$136.76	–
Maryland	–	$154.75	–
Massachusetts	–	$105.05	–
Michigan	$100	$122.75	0.81
Minnesota	$75	$137.04	0.55
Mississippi	$150	$83.57	1.79
Missouri	$75	$74.50	1.01
Montana	–	$113.00	–
Nebraska	$75	$137.91	0.54

State	EV fee	Average gasoline tax collected for gasoline vehicles	Ratio of EV fee to gas tax revenues
Nevada	–	$103.83	–
New Hampshire	–	$110.18	–
New Jersey	–	$166.78	–
New Mexico	–	$71.77	–
New York	–	$106.44	–
North Carolina	$130	$159.46	0.82
North Dakota	$120	$96.54	1.24
Ohio	$200	$124.03	1.61
Oklahoma	–	$85.44	–
Oregon	$110	$115.59	0.95
Pennsylvania	–	$249.58	–
Rhode Island	–	$152.38	–
South Carolina	$60	$81.60	0.74
South Dakota	–	$125.11	–
Tennessee	$100	$111.02	0.90
Texas	–	$96.13	–
Utah	$90	$111.64	0.81
Vermont	–	$134.98	–
Virginia	$64	$70.75	0.90
Washington	$150	$190.66	0.79
West Virginia	$200	$169.78	1.18
Wisconsin	$100	$142.37	0.70
Wyoming	$200	$101.06	1.98

Source: Atlas Public Policy 2021

Appendix F. Public EV Charging Stations

State	Number of public EV charging ports	2020 population	Ports per 100,000 people
Vermont	598	643,077	92.99
District of Columbia	572	689,545	82.95
California	29,373	39,538,223	74.29
Massachusetts	4,395	7,029,917	62.52
Colorado	3,077	5,773,714	53.29
Hawaii	768	1,455,271	52.77
Utah	1,564	3,271,616	47.81
Rhode Island	512	1,097,379	46.66
Maryland	2,786	6,177,224	45.10
Washington	3,294	7,705,281	42.75
Oregon	1,747	4,237,256	41.23
Maine	539	1,362,359	39.56
Nevada	911	3,104,614	29.34
Missouri	1,791	6,154,913	29.10
Kansas	844	2,937,880	28.73
Georgia	2,806	10,711,908	26.20
New York	5,268	20,201,249	26.08
Connecticut	886	3,605,944	24.57
Arizona	1,724	7,151,502	24.11
Delaware	237	989,948	23.94
Virginia	2,038	8,631,393	23.61
Oklahoma	928	3,959,353	23.44
Florida	4,510	21,538,187	20.94
Michigan	1,837	10,077,331	18.23
North Carolina	1,892	10,439,388	18.12
Pennsylvania	2,126	13,002,700	16.35
Tennessee	1,126	6,910,840	16.29

State	Number of public EV charging ports	2020 population	Ports per 100,000 people
New Hampshire	224	1,377,529	16.26
Nebraska	317	1,961,504	16.16
Minnesota	917	5,706,494	16.07
Ohio	1,853	11,799,448	15.70
New Mexico	315	2,117,522	14.88
North Dakota	111	779,094	14.25
Iowa	450	3,190,369	14.10
Illinois	1,781	12,812,508	13.90
New Jersey	1,252	9,288,994	13.48
Texas	3,854	29,145,505	13.22
Wyoming	72	576,851	12.48
South Carolina	580	5,118,425	11.33
Montana	116	1,084,225	10.70
Arkansas	314	3,011,524	10.43
Wisconsin	609	5,893,718	10.33
Alaska	72	733,391	9.82
Idaho	173	1,839,106	9.41
Kentucky	363	4,505,836	8.06
Indiana	517	6,785,528	7.62
West Virginia	134	1,793,716	7.47
Alabama	369	5,024,279	7.34
South Dakota	65	886,667	7.33
Mississippi	135	2,961,279	4.56
Louisiana	203	4,657,757	4.36

Appendix G. Incentives for High-Efficiency Vehicles

State	Tax incentive
Arizona	Electric vehicle (EV) owners in Arizona pay a significantly reduced vehicle license tax—$4 for every $100 in assessed value—as part of the state's Reduced Alternative Fuel Vehicle License Tax program.
California	AB 118 targets medium- and heavy-duty trucks in a voucher program that aims to reduce the up-front incremental cost of purchasing a hybrid vehicle. Vouchers for up to $117,000 are available, depending on vehicle specifications, and are issued directly to fleets that purchase hybrid trucks for use within the state. California also offers rebates of up to $5,000 for light-duty zero-emission EVs and plug-in hybrid EVs on a first-come, first-served basis.
Colorado	In 2019, the Colorado legislature approved HB 1159, a bill that extends the state's alternative fuel vehicle tax credits through 2025. It sets a flat $5,000 credit, through 2019, for the purchase of a light-duty electric vehicle and makes the credit assignable to a car dealer or finance company, effectively turning the credit into a point-of-sale incentive. The tax credit declines to $4,000 for vehicles purchased in 2020, $2,500 for vehicles purchased in 2021 and 2022, and $2,000 for vehicles purchased in 2023–2025. Higher incentives are available for light-, medium-, and heavy-duty trucks.
Connecticut	The Connecticut Hydrogen and Electric Automobile Purchase Rebate (CHEAPR) offers incentives to Connecticut residents who purchase or lease an eligible vehicle from a licensed Connecticut automobile dealership. Incentive amounts currently range from $4,250 for an eligible new battery electric (BEV), $2,250 for a plug-in hybrid electric (PHEV), and up to $9,500 for a fuel cell electric vehicle (FCEV). There are currently more than 30 eligible vehicles available, and the list continues to grow as manufacturers release new models.
Delaware	As part of the Delaware Clean Transportation Incentive Program, the following rebates are available: • $3,500 for battery EVs under $60,000 Manufacturer's Suggested Retail Price (MSRP) • $1,500 for plug-in hybrid EVs and EVs with gasoline range extenders under $60,000 MSRP • $1,000 for battery and plug-in hybrid EVs over $60,000 MSRP
District of Columbia	The District of Columbia offers a reduced registration fee and a vehicle excise tax exemption for owners of all vehicles with an EPA-estimated city fuel economy of at least 40 miles per gallon.
Illinois	The Illinois Environmental Protection Agency will offer a $4,000 rebate toward the purchase of new or used EV from July 1, 2022 through June 30, 2026.
Maine	Maine offers a $2,000 rebate for qualified electric vehicles, a $1,000 rebate for plug-in hybrids, and an enhanced rebate for low-income individuals, using monies from the Volkswagen Settlement Fund.
Maryland	Maryland offers a tax credit for EVs and fuel cell vehicles of up to $3,000 dollars per vehicle. The rebate is limited to one vehicle per individual, and 10 vehicles per business entity.

State	Tax incentive
Massachusetts	The Massachusetts Offers Rebates for EVs (MOR-EV) program offers rebates of up to $2,500 to customers purchasing plug-in EVs.
New Jersey	All zero-emission vehicles in New Jersey are exempt from state sales and use taxes. In addition, vehicles that have an EPA fuel economy rating of less than 19 mpg or cost $45,000 or more in sales or lease price are subject to a fuel-inefficient vehicle fee.
New York	Pursuant to legislation passed in April 2016, NYSERDA developed a rebate program for zero-emission vehicles that launched in March 2017. Rebates of up to $2,000 per vehicle are available for battery EVs, plug-in hybrid EVs, and fuel cell vehicles. New York also started the New York Truck Voucher Incentive Program in 2014. Vouchers of up to $60,000 are available for the purchase of hybrid and all-electric class 3–8 trucks.
Oregon	The Oregon Clean Vehicle Rebate Program offers rebates of $1,500–2,500 toward the purchase of a new hybrid or battery electric vehicle, depending on battery capacity. Rebates of $2,500 are available to low- and moderate-income households for the purchase of new and used EVs. All eligible vehicles must have a base MSRP of less than $50,000. There is also a K-12 ZEV funding program that draws from Public Purpose Charge funds.
Pennsylvania	The Alternative Fuels Incentive Grant Program offers rebates to assist eligible residents in purchasing new alternative fuel vehicles. Qualified electric vehicles earn a rebate of $1,750.
Texas	Electric vehicles weighing 8,500 pounds or less and purchased after September 1, 2013, are eligible for a $2,500 rebate.
Utah	Until December 2020, taxpayers were eligible for tax credits for the purchase of qualifying electric heavy-duty vehicles. Vehicles purchased in 2019 were eligible for an $18,000 tax credit. The tax credit amount has been gradually reduced from $25,000 in 2017 to $15,000 by 2020.
Vermont	The Vermont Agency of Transportation provides purchase incentives for EVs with a retail price of $40,000 or less that vary based upon household income and marital status. Incentives range from $1,500 to $4,000.
Virginia	The Virginia Department of Mines, Minerals and Energy, in collaboration with the Virginia Department of Transportation, offers up to $10,000 to state agencies and local governments for the incremental cost of new or converted alternative fuel vehicles.
Washington	Tax credits are available to businesses that purchase new alternative fuel commercial vehicles. Businesses may claim up to $250,000 or credits for 25 vehicles per year through January 1, 2021. HB 2042, passed in March 2019, also extends tax credits for light-duty passenger vehicles.

Source: DOE 2022a

Appendix H. State Transit Funding

State	FY 2020 funding	2020 population*	Per capita transit expenditure
Massachusetts	$2,333,720,000	7,029,917	$331.97
New York	$5,965,480,000	20,201,249	$295.30
Connecticut	$708,350,000	3,605,944	$196.44
District of Columbia	$878,990,000	5,000,000	$175.80
Pennsylvania	$1,729,020,000	13,002,700	$132.97
Maryland	$813,640,000	6,177,224	$131.72
Alaska	$93,390,000	733,391	$127.34
Delaware	$117,730,000	989,948	$118.93
Illinois	$1,353,870,000	12,812,508	$105.67
Minnesota	$583,090,000	5,706,494	$102.18
California	$3,676,090,000	39,538,223	$92.98
Virginia	$600,580,000	8,631,393	$69.58
Rhode Island	$63,380,000	1,097,379	$57.76
New Jersey	$368,640,000	9,288,994	$39.69
Michigan	$301,860,000	10,077,331	$29.95
Oregon	$125,320,000	4,237,256	$29.58
Wisconsin	$115,980,000	5,893,718	$19.68
Florida	$396,920,000	21,538,187	$18.43
Washington	$117,350,000	7,705,281	$15.23
Vermont	$8,160,000	643,077	$12.69
Colorado	$72,000,000	5,773,714	$12.47
Maine	$14,730,000	1,362,359	$10.81
Tennessee	$69,770,000	6,910,840	$10.10
Indiana	$67,940,000	6,785,528	$10.01
North Carolina	$91,650,000	10,439,388	$8.78
Ohio	$70,000,000	11,799,448	$5.93
North Dakota	$4,260,000	779,094	$5.47
Iowa	$17,370,000	3,190,369	$5.44

State	FY 2020 funding	2020 population*	Per capita transit expenditure
Kansas	$11,000,000	2,937,880	$3.74
Wyoming	$1,890,000	576,851	$3.28
Nebraska	$6,300,000	1,961,504	$3.21
New Mexico	$6,600,000	2,117,522	$3.12
Utah	$6,370,000	3,271,616	$1.95
Arizona	$11,260,000	7,151,502	$1.57
Georgia	$15,700,000	10,711,908	$1.47
Oklahoma	$5,750,000	3,959,353	$1.45
Montana	$1,480,000	1,084,225	$1.37
Texas	$37,420,000	29,145,505	$1.28
West Virginia	$2,260,000	1,793,716	$1.26
Arkansas	$3,690,000	3,011,524	$1.23
South Dakota	$1,050,000	886,667	$1.18
Louisiana	$4,960,000	4,657,757	$1.06
South Carolina	$5,000,000	5,118,425	$0.98
Mississippi	$1,920,000	2,961,279	$0.65
New Hampshire	$820,000	1,377,529	$0.60
Kentucky	$1,350,000	4,505,836	$0.30
Missouri	$1,710,000	6,154,913	$0.28
Idaho	$310,000	1,839,106	$0.17
Alabama	$0	5,024,279	$0.00
Hawaii	$0	1,455,271	$0.00
Nevada	$0	3,104,614	$0.00

*** Population figures represent total area served by transit system. Source: AASHTO 2022**

Appendix I. State Transit Legislation

State	Description	Source
Alabama	Alabama Act 2018-161 requires the Alabama Department of Economic and Community Affairs to create, oversee, and administer the Alabama Public Transportation Trust Fund, establishing a path to increase public transportation options in the state.	legiscan.com/AL/bill/SB85/2018
Arkansas	Passed in 2001, Arkansas Act 949 established the Arkansas Public Transit Fund, which directs monies from rental vehicle taxes toward public transit expenditures.	www.arkleg.state.ar.us/assembly/2001/R/Acts/Act949.pdf
California	California's Transportation Development Act provides two sources of funding for public transit: the Location Transportation Fund (LTF) and the State Transit Assistance (STA) Fund. The general sales tax collected in each county is used to fund each county's LTF. STA funds are appropriated by the legislature to the state controller's office. The statute requires that 50% of STA funds be allocated according to population and 50% be allocated according to operator revenues from the prior fiscal year.	www.dot.ca.gov/hq/MassTrans/State-TDA.html
Colorado	In 2018, Colorado adopted SB1, which significantly expands state funding for transit. SB1 creates a new multimodal options fund dedicated to public transit and bicycle and pedestrian infrastructure and operations.	leg.colorado.gov/bills/sb18-001
Florida	House Bill 1271 allows municipalities in Florida with a regional transportation system to levy a tax, subject to voter approval, that can be used as a funding stream for transit development and maintenance.	www.myfloridahouse.gov/sections/Bills/billsdetail.aspx?BillId=44036
Georgia	The Transportation Investment Act, enacted in 2010, allows municipalities to pass a sales tax for the express purpose of financing transit development and expansion.	gsfic.georgia.gov/transportation-investment-act
Hawaii	Section HRS 46-16.8 of the Hawaii Revised Statutes allows municipalities to add a county surcharge to state tax; the surcharge is then funneled toward mass transit projects.	www.capitol.hawaii.gov/hrscurrent/Vol02_Ch0046-0115/HRS0046/HRS_0046-0016_0008.htm
Illinois	House Bill 289 allocates $2.5 billion for the creation and maintenance of mass transit facilities from the issuance of state bonds.	legiscan.com/gaits/text/70761
Indiana	House Bill 1011 specifies that a county or city council may elect to provide revenue to a public transportation corporation from the distributive share of county adjusted gross income taxes, county option income taxes, or county economic development income taxes. An additional county economic development income tax no higher than 0.3% may also be imposed to pay the county's contribution to the funding of the metropolitan transit district. Only	legiscan.com/IN/text/HB1011/id/673339

State	Description	Source
	six counties within the state may take advantage of this legislation.	
Iowa	The Iowa State Transit Assistance Program devotes 4% of the fees for new registration collected on sales of motor vehicle and accessory equipment to support public transportation.	www.iowadot.gov/transit/funding.html
Kansas	Transportation Works for Kansas legislation, adopted in 2010, provides financing for a multimodal development program in communities with immediate transportation needs.	votesmart.org/bill/11412/30514/transportation-works-for-kansas-program%20%28T-Works%20for%20Kansas%20Program%29
Maine	The Maine Legislature created a dedicated revenue stream for multimodal transportation in 2012. The Multimodal Transportation Fund uses sales tax revenues derived from vehicle rentals. Funds must be used for purchasing, operating, maintaining, improving, repairing, constructing, and managing the assets of non-road forms of transportation.	www.mainelegislature.org/legis/statutes/23/title23sec4210-B.html
Maryland	In 2018, Maryland passed the Maryland Metro/Transit Funding Act. Maryland's Transportation Trust Fund must provide at least $167 million in revenues to the Washington Suburban Transit District through an annual grant that will be used to pay capital costs of the Washington Metropolitan Area Transit Authority. In addition, the legislation requires that at least $29.1 million of the revenue from the Transportation Trust Fund be provided for capital needs of the Maryland Transit Administration (MTA) in fiscal years 2020, 2021, and 2022. The legislation further requires that those appropriations for the MTA be increased by at least 4.4% over the previous year, starting with the fiscal year 2019 budget.	mgaleg.maryland.gov/2018RS/chapters_noln/Ch_352_hb0372E.pdf; see Transportation Article §3–216.and §7–205
Massachusetts	Section 35T of Massachusetts general law establishes the Massachusetts Bay Transportation Authority State and Local Contribution Fund. This account is funded by revenues from a 1% sales tax.	malegislature.gov/Laws/GeneralLaws/PartI/TitleII/Chapter10/Section35t
Michigan	The Michigan Comprehensive Transportation Fund funnels both vehicle registration revenues and auto-related sales tax revenues toward public transportation and targeted transit demand management programs.	www.legislature.mi.gov/(S(hlkm5k45i240utf2mb0odtzt))/mileg.aspx?page=getObject&objectName=mcl-247-660b
Minnesota	House File 2700, adopted in 2010, is an omnibus bonding and capital improvement bill that provides $43.5 million for transit maintenance and construction. The bill also prioritized bonding authorization so that appropriations for transit construction for fiscal years 2011 and 2012 would amount to $200 million.	wdoc.house.leg.state.mn.us/leg/LS86/CEH2700.1.pdf
New York	In 2010, New York adopted Assembly Bill 8180, which increased certain registration and renewal fees to fund public transit. It also created the Metropolitan Transit Authority financial assistance fund to support subway, bus, and rail.	www.ncsl.org/issues-research/transport/major-state-transportation-legislation-2010.aspx#N

State	Description	Source
North Carolina	In 2009, North Carolina passed House Bill 148, which called for the establishment of a congestion relief and intermodal transportation fund.	www.ncleg.net/sessions/2009/bills/house/pdf/h148v2.pdf
Oregon	Oregon has a Lieu of State Payroll Tax Program that provides a direct, ongoing revenue stream for transit districts that can demonstrate equal local matching revenues from state agency employers in their service areas.	www.oregonlegislature.gov/citizen_engagement/Reports/2008PublicTransit.pdf
Pennsylvania	Act 44 of House Bill 1590, passed in 2007, allows counties to impose a sales tax on liquor or an excise tax on rental vehicles to fund the development of county transit systems.	www.legis.state.pa.us/WU01/LI/LI/US/HTM/2007/0/0044..HTM
Tennessee	Senate Bill 1471, passed in 2009, calls for the creation of a regional transportation authority in major municipalities. It allows these authorities to set up dedicated funding streams for mass transit either by law or through voter referendum.	state.tn.us/sos/acts/106/pub/pc0362.pdf
Utah	Utah's comprehensive transportation funding bill, passed in 2015, allows counties to implement a 0.25% local sales tax to fund locally identified transportation needs. Of all revenues collected using this mechanism, 40% must be awarded to the county transit agency.	le.utah.gov/~2015/bills/static/HB0362.html
Virginia	House Bill 2313, adopted in 2013, created the Commonwealth Mass Transit Fund, which receives approximately 15% of revenues collected from the implementation of a 1.5% sales and use tax for transportation expenditures.	lis.virginia.gov/cgi-bin/legp604.exe?131+ful+CHAP0766
Washington	In 2015, SB 5987, the Connecting Washington Package, was passed, allocating $16 billion toward transportation connectivity, maintenance, and development projects.	apps.leg.wa.gov/documents/billdocs/2011-12/Pdf/Bills/Session%20Laws/House/2660.SL.pdf
West Virginia	In 2013, the West Virginia Commuter Rail Access Act (Senate Bill 03) established a special fund in the state treasury to pay track access fees accrued by commuter rail services operating within the state's borders. The funds can be rolled over from year to year and are administered by the West Virginia State Rail Authority.	www.legis.state.wv.us/Bill_Status/bills_text.cfm?billdoc=SB103%20SUB1%20ENR.htm&yr=2013&sesstype=RS&i=103

Appendix J. Total Energy and Cost Savings from State Financial Incentives

State	Title	Program administrator	Program-level energy savings	Program-level monetary savings	Estimated avoided CO_2 emissions
California	Bright Schools Program	California Energy Commission	74,246 (CY 2020/2021)	$18,815	51,230 (CY 2020–21)
California	Clean Energy Jobs Act Program (Proposition 39 K-12 Program)	California Energy Commission	341,570 kWh/year	$66.3 million/year	117,897 tons/year
California	Energy Partnership Program	California Energy Commission	384,676 (CY 2020-2021)	$51,647	268,883
California	Energy Conservation Assistance Act	California Energy Commission	2,259,850 kWh (FY 2021/2022)	$381,956 (FY 2021/2022)	748 tons/year CO_2E
California	Energy Conservation Assistance Act—Education Subaccount	California Energy Commission	21,500,000 kWh FY 2013/2014–FY 2019/2020		7,114 tons/year CO_2E
California	GoGreen Financing Program (Formerly CHEEF)	California Alternative Energy and Advanced Transportation Financing Authority	720,700 kWh and 58,000 therms		Cumulative GHG reductions of 1,212 U.S. tons of CO_2E as of 2021
California	Clean Energy Training and Workforce Development Program	California Conservation Corps	13,009,351 kWh		2,966
California	Farm Worker Low-Income Weatherization Program	Department of Community Service and Development	7,775,092 kWh and 332,714 therms		4,870
California	Multi-Family Low-Income Weatherization Program	Department of Community Service and Development	13,457,898 kWh and 806,490 therms		7,257

State	Title	Program administrator	Program-level energy savings	Program-level monetary savings	Estimated avoided CO_2 emissions
California	Urban Greening Program	Natural Resource Agency	10,486 kWh and 868 therms		55
California	Food Production Investment Program	California Energy Commission	44,739,400 kWh and 4,714,040 therms		1,761
California	Transformative Climate Communities	California Energy Commission	5,194,968 kWh and 278,986 therms		11,347
Connecticut	PosiGen Solar Lease and Energy Efficiency Energy Savings Agreement	CT Green Bank	8,217,936 annual (CY 2021) 205,448.380 lifetime	$810,389 annual $20,259,720 lifetime	4,542 annual tons (CY 2021) 113,557 lifetime tons
Connecticut	Smart E-loan	CT Green Bank	3,699,069 annual 73,621,153 lifetime	$403,605 annual $7,821,951 lifetime	1,488 annual tons 30,604 lifetime
Connecticut	Local Option—Commercial PACE Financing	CT Green Bank	4,738,834 annual 109,298,870 lifetime	$347,305 annual $10,424,831 lifetime	2,483 annual 57,114 lifetime tons
Connecticut	Business Energy Advantage Program		17,339,584 annual 208,075,007 lifetime		9,401 annual 112,808 lifetime tons
Delaware	Affordable Multifamily Housing	Sustainable Energy Utility	379,047		427,186
Delaware	Home Performance with Energy Star	Sustainable Energy Utility	1,744,964		1,966,574
Delaware	ZEMod	Sustainable Energy Utility	32,517		36,647
Delaware	Energize Delaware Farm Program	Sustainable Energy Utility	98,660		111,190

State	Title	Program administrator	Program-level energy savings	Program-level monetary savings	Estimated avoided CO_2 emissions
Delaware	Revolving Loan Fund	Sustainable Energy Utility	1,107,800		1,248,491
Delaware	Pathways to Green Schools	Sustainable Energy Utility	219,741		247,648
Delaware	Faith Efficiencies Partnership	Sustainable Energy Utility	71,483		80,561
Delaware	Energy Efficiency Investment Fund Rebates	Department of Natural Resources and Environmental Control	13,773,057		15,522,235
Delaware	E2I: Energy Efficiency Industrial	Department of Natural Resources and Environmental Control	21,856,059		24,631,778
Maine	Efficiency Maine Electric Vehicle and EV Infrastructure	Efficiency Maine Trust	149,614,302	$15,736,324	41,144
Maine	Efficiency Maine Home Energy Savings Program	Efficiency Maine Trust	238,827,374	$18,576,716	65,678
Maine	Efficiency Maine Low-Income Initiatives	Efficiency Maine Trust	161,559,789	$15,134,197	44,429
Maine	Efficiency Maine C&I Prescriptive Program and Small Business Initiative	Efficiency Maine Trust	167,982,415	$10,748,316	46,195
Maine	Efficiency Maine C&I Custom Program	Efficiency Maine Trust	25,829,719	$1,502,670	7,103
Maine	Efficiency Maine Retail and Distributor Program	Efficiency Maine Trust	84,894,783	$5,241,724	23,346
Massachusetts	Green Communities Grant	State Energy Office	10,529,477	$2,627,744	7,155

State	Title	Program administrator	Program-level energy savings	Program-level monetary savings	Estimated avoided CO_2 emissions
	Program				
Michigan	AgriEnergy and Sustainable Farming	State Energy Office	100,000 kWh per year and 300 ccf natural gas	Cost savings of $11,000 per year	71 metric tons of CO_2 emissions avoided
Montana	Alternative Energy Revolving Loan Program	State Energy Office	FY21: 560,261 kWh	FY21: $65,287	FY21: 507,445
New Hampshire	School Energy Efficiency Development Grant	State Energy Office	~150,000 kWh	~$30,000	
New Jersey	Non-IOU HVAC	NJCEP	74,719		
New Jersey	Non-IOU HPwES	NJCEP	9,366		
New Jersey	Non-IOU Direct Install	NJCEP	1,338,542		
New Mexico	Sustainable Building Tax Credit (corporate)	State Energy Office	6,988,115 kBtu program life savings	$204,691 per year	
New Mexico	Sustainable Building Tax Credit (personal)	State Energy Office	67,931,953 kBtus (7,704 homes total over program life)	$5,837,571 program life savings	
New Mexico	Energy Efficiency & Renewable Energy Bond Program/Clean Energy Revenue Bond Program	State Energy Office	1,862,283 kWh	$193,810 guaranteed savings per year	
Pennsylvania	Small Business Advantage Grant Program	PA Department of Environmental Protection, Small Business Ombudsman	6,884,678 kWh/yr	$943,568/ yr	2,719 tons
Rhode Island	Agricultural Energy Program	RI Office of Energy Resources	792.6 kW produced annually	$892,917 for the lifetime, including	2,603 tons of avoided CO_2

State	Title	Program administrator	Program-level energy savings	Program-level monetary savings	Estimated avoided CO_2 emissions
				spring 2022 round	emissions from 2016–2020
Rhode Island	Efficient Buildings Fund	OER and Rhode Island Infrastructure Bank (RIIB)	FY22, 12.88 GWh reduced	Since 2017, $108.7 million in energy savings in total	9,129 metric tons of CO_2 in 2022 alone
Rhode Island	Block Island Utility District EE Program	Block Island Utility District	Annual Energy savings: 10.3 MWh	Estimated annual bill savings: $3,100	Annual CO_2 reduction: 8.1 tons of CO_2
Rhode Island	LED Municipal Streetlight Program	RI Office of Energy Resources	188,591 MWh as of 2020 RGGI report	Total Energy Bill savings of $22,943,034 for lifetime of program	164,673 tons of CO_2 for lifetime of program
Rhode Island	Pascoag Utility District Energy Efficiency Program	RI Office of Energy Resources	2,338MWh as of 2020 RGGI report	$325,036 for lifetime of program, according to 2020 RGGI report	984 tons of CO_2 avoided as of 2020
Rhode Island	Zero Energy for the Ocean State	OER, RIHousing, RI Energy	911kWh avoided, 3.12MMBtu avoided in 2021	$102.49 energy bill savings in 2021	0.394 metric tons of CO_2 avoided in 2021
Tennessee	EmPOWER TN Initiative	Tennessee Department of Environment and Conservation, Office of Energy Programs	34.1 Million kWh	$4.2 Million	26,639 tons
Tennessee	Energy Efficient Schools Initiative—Grants	Energy Efficient Schools Initiative	Cumulative energy savings exceeds 270 million kWh (2012–2019)	Approx. $43 million or $4.1 million/year	

State	Title	Program administrator	Program-level energy savings	Program-level monetary savings	Estimated avoided CO_2 emissions
Tennessee	Energy Efficient Schools Initiative—Loans	Energy Efficient Schools Initiative	Since inception of the loan fund, EESI's kWh savings are estimated to exceed 283 million kWh	Monetary savings through the loan fund exceeds $28 million	
Tennessee	Pathway Energy Efficiency and Renewable Energy Loan Program	Pathway Lending	2,160,301 kWh from 2020 loans	Average estimated annual energy savings of $9,811 per program participant during program year 2020	
Wyoming	Local Government Energy Improvement Retrofit Grant	State Energy Office	364,911	$37,220	655,034.76
Wyoming	K-12 Public Schools Energy Improvement Grant	State Energy Office	630,999	$59,908.01	1,037,164.16