THE 2020 STATE ENERGY EFFICIENCY SCORECARD

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Executive Summary

KEY FINDINGS

This report ranks U.S. states on their policy and program efforts to save energy and pursue efficiency as a cost-effective, critical tool for slashing emissions and meeting state clean energy goals.

In a year dramatically impacted by a global pandemic and associated recession, efforts to advance clean energy goals struggled to maintain momentum amid the loss of 400,000 energy efficiency jobs by the summer and disruptions to countless lives. Despite these challenges, some states continued to successfully prioritize energy efficiency as an important resource to help reduce household and business energy bills, create jobs, and reduce emissions.

First place goes to California, which sets the pace in saving energy on multiple fronts with adoption of net-zero energy building codes, stringent vehicle emissions standards, and industry-leading appliance standards. Growing efforts to decarbonize the state's building sector are a cornerstone of its pursuit of a 100% clean energy future. California continues to serve as a leader and standard-setter for the country in fighting climate change. More than a dozen states have adopted California's low-emissions vehicle regulations, and nine states have adopted its zero-emission vehicle program.

Rounding out the top 10 are Massachusetts at #2, followed by Vermont (#3), Rhode Island (#4), New York (#5), Maryland (#6), Connecticut (#7), the District of Columbia (#8), and a tie between Minnesota, and Oregon (#9).

Regional leaders included Massachusetts (#2) in the Northeast, Minnesota (#9) in the Midwest, California (#1) in the West, Colorado (#11) in the Southwest, and Virginia (#25) in the South.

This year's most improved state was Nevada. Last year the governor also signed AB54, adopting federal standards into state law in order to protect against federal efforts to roll back energy-saving light bulb standards. Additionally, the state has adopted the 2018 International Energy Conservation Code (IECC) for residential and commercial buildings, and in June Nevada's environmental agency announced plans to adopt California's vehicle emission standards and Zero-Emission Vehicle (ZEV) mandate.

Other states to watch include Virginia and New Jersey. They are the most recent additions to the list of now 27 states that have adopted a utility-sector energy efficiency resource standard. Stakeholders in both states continue to select and design programs to scale up efficiency offerings to meet the new standards.

Iowa fell the farthest in the rankings, an outcome of 2018 legislation that capped demand-side investment at a low level and enabled customers to opt out of paying for programs, leading to a steep decline in electric and gas savings in 2019.

Savings from ratepayer-funded electric efficiency programs remained fairly level compared with last year's results, totaling approximately 26.9 million megawatt-hours. These savings are equivalent to about 0.70% of total retail electricity sales in the United States in 2019, enough to power almost 2.6 million homes for a year.

Buildings efficiency advocates celebrated the release of the 2021 International Energy Conservation Code (IECC), the most significant advancement in model code efficiency in almost a decade. The code represents a major victory for a broad coalition of stakeholders and International Code Council voting members, including cities and states. The resulting 10% estimated improvement in efficiency will offer U.S. states and cities a great opportunity to save money and reduce GHG emissions from buildings.

The *State Energy Efficiency Scorecard*, now in its 14th edition, ranks states on their policy and program efforts over the past year.[1] It assesses performance, documents best practices, and recognizes leading efficiency strategies deployed in the service of state climate goals. These efficiency policies offer a vital strategy for states to reduce their greenhouse gas (GHG) footprints in a massive way. ACEEE analyses have determined that the United States can slash its projected energy use approximately 50% by 2050 through a suite of energy efficiency measures including zero-energy homes, building retrofits, industrial energy efficiency, and vehicle fuel economy.[2]

Figure ES1 shows the states' rankings, divided into five tiers for ease of comparison. Later in this section, table ES1 provides details of each state's scores.

[1] The report considers programs and policies adopted as of July 2020. However, scores for some performance-based categories, such as those in Chapter 2 (utility programs), were determined by the latest available data from 2019 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).

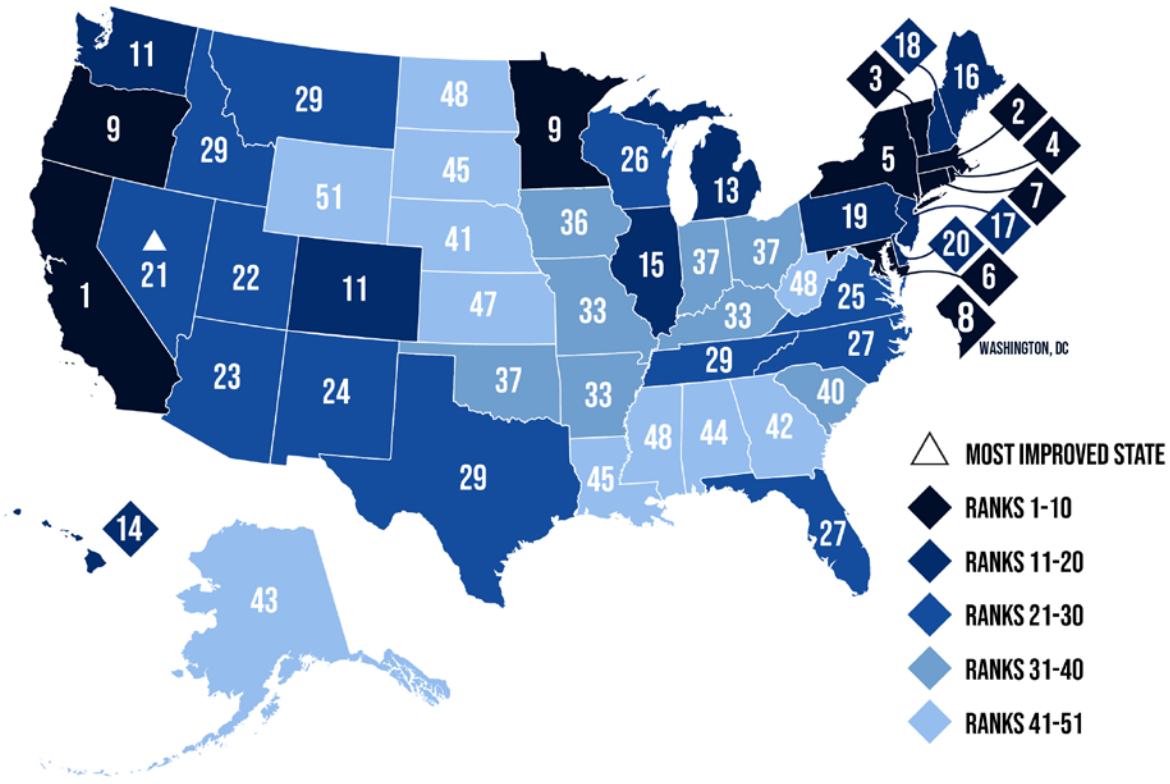

Figure ES1. *2020 State Scorecard* rankings

Following a vibrant 2019 that saw numerous states and utilities adopt ambitious climate goals, clean energy struggled somewhat to maintain a place on the policy agenda in 2020. Governments at all levels had to abruptly shift their focus to mitigate the health and economic impacts of a deadly global pandemic, and by the summer of 2020, COVID-19 had forced more than 600,000 in the clean energy sector out of work, with energy efficiency contractors among those hit hardest, representing about 70% of the total.[3] As states and legislators scrambled to redirect resources and contain both a health and an economic crisis, momentum slowed on many efforts to advance energy-saving policies.

Yet in spite of these challenges, several states celebrated some very promising policy achievements this year, laying the foundations to greatly scale up efficiency programs and slash emissions. These states included Virginia and New Jersey, which have joined 25 other states that have adopted a robust energy efficiency resource standard for their utility power sectors. Major efficiency and climate bills were also in play in Illinois, Maryland, Colorado, and Minnesota; while these stalled amid the pandemic, they are likely to remain on the table

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

as advocates and stakeholders continue to champion efficiency's role in meeting carbon goals.

It is also important to recognize that 2020 was a momentous year for buildings sector efficiency, following the release of the 2021 International Conservation Energy Code (IECC). The new codes, which require at least a 10% improvement in efficiency beyond the previous codes, were also a major achievement for the broad coalition of organizations and stakeholders that worked more than a year on education and outreach. These efforts helped spur state and local governments to make their voices heard by voting on and adopting the new codes. The 2021 IECC notably includes a new optional appendix enabling zero-energy performance. Local governments also overwhelmingly voted to include provisions for electric vehicle and electric appliance readiness as well as increased water heater efficiency, though these were unfortunately removed by the ICC Board of Directors upon appeal.

In addition, a growing number of states are embracing California's low- and zero-emission vehicle rules in an effort to maintain momentum on vehicle efficiency at a time when current federal leadership has sought to roll back national vehicle emissions standards. Since late 2019, Minnesota, New Mexico, and Nevada have all indicated plans to adopt these rules—joining more than a dozen others that have already done so—in a growing coalition of states committed to reducing transportation-driven emissions.

State-driven appliance standards also remained extremely important against the backdrop of federal rollback efforts. By establishing minimum efficiency thresholds for common home and office products like lighting, electronic devices, and plumbing fixtures, these state standards have been critical to helping consumers save on utility bills and spurring adoption of stronger national standards. Since our last report, California, New York, and Oregon have each advanced new standards, and Massachusetts, New Jersey, and DC have filed proposed bills still under consideration.

POLICY AREAS

The *Scorecard* compares states across five policy areas:[4]

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

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.

[4] The 2020 *State Scorecard* removes our discussion of combined heat and power (CHP) policies. We continue to count savings from CHP in our utility program scoring metrics (Chapter 2).

Table ES1. States adopting best-practice policies

Area	States	Achievements
Utility and public benefits	Rhode Island, Massachusetts, Maryland, Vermont	All have adopted robust energy efficiency resource standards and continue to post electric utility savings above 2% of retail sales, the highest levels in the nation.
Transportation	California, District of Columbia, Massachusetts, Maryland, Oregon, Vermont, Washington	Each of these jurisdictions has adopted California's vehicle emissions standards as well as its Zero-Emission Vehicle (ZEV) program, and each has adopted goals to reduce vehicle miles traveled or transportation-related GHGs.
Building energy efficiency	California, Delaware, Illinois, Oregon, Maryland, Massachusetts, 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 the 2018 IECC, ASHRAE 90.1-2016, or stronger, in addition to devoting resources to maintaining code compliance.
State government initiatives	California, Connecticut, Delaware, Massachusetts, Rhode Island, Vermont	These states led this year in offering loan and grant programs to spur energy savings, setting efficiency standards for public buildings and fleets, and investing proceeds from carbon pricing policies in efficiency programs.
Appliance/equipment standards	California, Colorado, Nevada, Washington, Vermont, Hawaii, New York	Each of these states passed appliance standards since 2019 that are expected to save consumers hundreds of millions of dollars on utility bills.

SCORES

Table ES2 presents state scores in the five policy areas and their total scores.

Table ES2. State scores in the *2020 State Scorecard*

Rank	State	Utility and public benefits programs & policies (20 pts.)	Trans-portation policies (12 pts.)	Building energy efficiency policies (9 pts.)	State government initiatives (6 pts.)	Appliance efficiency standards (3 pts.)	**TOTAL SCORE (50 pts.)**	Change in rank from 2019	Change in score from 2019
1	California	16	10.5	7.5	6	3	43	1	–0.5
2	Massachusetts	19.5	10	7	6	0	42.5	–1	–2
3	Vermont	17.5	8.5	6	6	2	40	0	-0.5
4	Rhode Island	19.5	8	6	6	0	39.5	–1	–1
5	New York	13.5	10.5	6.5	5.5	0.5	36.5	0	–0.5
6	Maryland	13.5	9.5	6	5.5	0	34.5	1	0
7	Connecticut	12.5	8.5	6.5	6	0	33.5	–1	–3
8	District of Columbia	9.5	11	8.5	4	0	33	3	4
9	Minnesota	13	7	6.5	5.5	0	32	–1	–0.5
9	Oregon	11	8.5	7	5.5	0	32	0	0
11	Colorado	9.5	7.5	6	5.5	2	30.5	3	3.5
11	Washington	7.5	8.5	7.5	5	2	30.5	–1	–1
13	Michigan	13	5.5	6.5	3.5	0	28.5	0	0
14	Hawaii	11	6	7	2.5	1.5	28	2	2.5
15	Illinois	12	5	6	4	0	27	–4	–2
16	Maine	9	7.5	4.5	5.5	0	26.5	–1	0.5
17	New Jersey	8.5	7	6.5	3	0	25	0	1
18	New Hampshire	10	3.5	5.5	5.5	0	24.5	2	3.5
19	Pennsylvania	4	6.5	6.5	5	0	22	–1	–1.5
20	Delaware	3.5	6.5	5.5	6	0	21.5	1	1
21	Nevada	5	4	6.5	4.5	1	21	5	5.5
22	Utah	6.5	4.5	6	3.5	0	20.5	0	1
23	Arizona	8.5	5	4.5	2	0	20	–4	–1.5
24	New Mexico	6.5	3.5	4.5	4	0	18.5	9	4.5
25	Virginia	1.5	6	5.5	5	0	18	4	3
26	Wisconsin	7.5	2.5	3	4	0	17	–1	1
27	Florida	1.5	5	6	4	0	16.5	–3	0
27	North Carolina	3	4.5	5	4	0	16.5	–1	1
29	Idaho	6	1	5.5	2	0	14.5	1	0
29	Montana	3.5	2.5	5.5	3	0	14.5	7	2
29	Tennessee	1	5	3.5	5	0	14.5	1	0
29	Texas	1	3.5	6.5	3.5	0	14.5	–3	–1
33	Arkansas	7	0	3	3.5	0	13.5	0	–0.5
33	Kentucky	1.5	3	5	4	0	13.5	5	2.5
33	Missouri	2.5	3	4	4	0	13.5	–3	–1
36	Iowa	4	3.5	4	1	0	12.5	–13	–6
37	Indiana	4	3	3	1.5	0	11.5	3	1
37	Ohio	4	0.5	3.5	3.5	0	11.5	–4	–2.5
37	Oklahoma	4	3.5	1.5	2.5	0	11.5	0	–0.5
40	South Carolina	2	2.5	2.5	4	0	11	0	0.5
41	Nebraska	0.5	2	6	2	0	10.5	2	1
42	Georgia	2	1.5	4.5	2	0	10	–4	–1
43	Alaska	1	3.5	1.5	3.5	0	9.5	–3	–1
44	Alabama	0	0.5	5.5	3	0	9	–1	–0.5
45	Louisiana	0.5	3	2	2.5	0	8	3	1.5
45	South Dakota	2	2	3.5	0.5	0	8	1	1
47	Kansas	0.5	2	3.5	1	0	7	–1	0
48	Mississippi	2	0.5	0.5	2.5	0	5.5	–3	–2.5
48	North Dakota	0	2	3	0.5	0	5.5	2	0.5
48	West Virginia	–1	1	4	1.5	0	5.5	0	–1
51	Wyoming	1	0.5	0	2.5	0	4	0	–0.5

REGIONAL HIGHLIGHTS

For the first time, the *2020 State Scorecard* ranks states not only nationally but also regionally, making it possible to compare states that have shared geographies and similar climatic conditions. States can assess how their progress on energy efficiency compares to that of their neighbors. Table ES3 shows the state rankings broken down by region.

Table ES3. Regional rankings in the *2020 State Scorecard*

Regional rank	State	Utility and public benefits programs & policies (20 pts.)	Trans-portation policies (12 pts.)	Building energy efficiency policies (9 pts.)	State government initiatives (6 pts.)	Appliance efficiency standards (3 pts.)	**TOTAL SCORE (50 pts.)**	Change in national rank from 2019	Change in score from 2019
Midwest									
1	Minnesota	13	7	6.5	5.5	0	32	–1	–0.5
2	Michigan	13	5.5	6.5	3.5	0	28.5	0	0
3	Illinois	12	5	6	4	0	27	–4	–2
4	Wisconsin	7.5	2.5	3	4	0	17	–1	1
5	Missouri	2.5	3	4	4	0	13.5	–3	–1
6	Iowa	4	3.5	4	1	0	12.5	–13	–6
7	Indiana	4	3	3	1.5	0	11.5	3	1
7	Ohio	4	0.5	3.5	3.5	0	11.5	–4	–2.5
9	Nebraska	0.5	2	6	2	0	10.5	2	1
10	South Dakota	2	2	3.5	0.5	0	8	1	1
11	Kansas	0.5	2	3.5	1	0	7	–1	0
12	North Dakota	0	2	3	0.5	0	5.5	2	0.5
Northeast									
1	Massachusetts	19.5	10	7	6	0	42.5	–1	–2
2	Vermont	17.5	8.5	6	6	2	40	0	-0.5
3	Rhode Island	19.5	8	6	6	0	39.5	–1	–1
4	New York	13.5	10.5	6.5	5.5	0.5	36.5	0	-0.5
5	Maryland	13.5	9.5	6	5.5	0	34.5	1	0
6	Connecticut	12.5	8.5	6.5	6	0	33.5	–1	–3
7	District of Columbia	9.5	11	8.5	4	0	33	3	4
8	Maine	9	7.5	4.5	5.5	0	26.5	–1	0.5
9	New Jersey	8.5	7	6.5	3	0	25	0	1
10	New Hampshire	10	3.5	5.5	5.5	0	24.5	2	3.5
11	Pennsylvania	4	6.5	6.5	5	0	22	–1	–1.5
12	Delaware	3.5	6.5	5.5	6	0	21.5	1	1
South									
1	Virginia	1.5	6	5.5	5	0	18	4	3
2	Florida	1.5	5	6	4	0	16.5	–3	0
2	North Carolina	3	4.5	5	4	0	16.5	–1	1
4	Tennessee	1	5	3.5	5	0	14.5	1	0
4	Texas	1	3.5	6.5	3.5	0	14.5	–3	–1
6	Arkansas	7	0	3	3.5	0	13.5	0	–0.5
6	Kentucky	1.5	3	5	4	0	13.5	5	2.5
8	Oklahoma	4	3.5	1.5	2.5	0	11.5	0	–0.5
9	South Carolina	2	2.5	2.5	4	0	11	0	0.5
10	Georgia	2	1.5	4.5	2	0	10	–4	–1
11	Alabama	0	0.5	5.5	3	0	9	–1	–0.5
12	Louisiana	0.5	3	2	2.5	0	8	3	1.5
13	West Virginia	–1	1	4	1.5	0	5.5	0	–1
13	Mississippi	2	0.5	0.5	2.5	0	5.5	–3	–2.5
Southwest									
1	Colorado	9.5	7.5	6	5.5	2	30.5	3	3.5
2	Nevada	5	4	6.5	4.5	1	21	5	5.5

Regional rank	State	Utility and public benefits programs & policies (20 pts.)	Trans-portation policies (12 pts.)	Building energy efficiency policies (9 pts.)	State government initiatives (6 pts.)	Appliance efficiency standards (3 pts.)	**TOTAL SCORE (50 pts.)**	Change in national rank from 2019	Change in score from 2019
3	Utah	6.5	4.5	6	3.5	0	20.5	0	1
4	Arizona	8.5	5	4.5	2	0	20	–4	–1.5
5	New Mexico	6.5	3.5	4.5	4	0	18.5	9	4.5
6	Wyoming	1	0.5	0	2.5	0	4	0	–0.5
				West					
1	California	16	10.5	7.5	6	3	43	1	–0.5
2	Oregon	11	8.5	7	5.5	0	32	0	0
3	Washington	7.5	8.5	7.5	5	2	30.5	–1	–1
4	Hawaii	11	6	7	2.5	1.5	28	2	2.5
5	Idaho	6	1	5.5	2	0	14.5	1	0
5	Montana	3.5	2.5	5.5	3	0	14.5	7	2
7	Alaska	1	3.5	1.5	3.5	0	9.5	–3	–1

This year's regional leaders are Minnesota (Midwest), Massachusetts (Northeast), Virginia (South), Colorado (Southwest), and California (West). In addition to these leaders, we have identified each region's "state to watch," where many promising new policy developments are emerging.

MIDWEST

Leading state: Minnesota ranked first in the region, driven by strong energy savings goals established under the state's 2007 Next Generation Energy Act. Minnesota continues to explore opportunities to advance efficiency in ways that promote building electrification and encourage adoption of electric vehicles. For example, in 2019, Governor Tim Walz called for the creation of Minnesota's Clean Car program, which would adopt California's tailpipe and ZEV standards; plans are ongoing to complete the approval process by the end of 2020.

State to watch: In Michigan, recently approved utility integrated resource plans have set Consumers Energy and DTE Energy, the state's two largest utilities, on paths to achieve savings even higher than those set in the state's statutory goals. With the recent creation of the Michigan Office of Future Mobility and the Council on Mobility and Electrification, the state is setting the stage to further vehicle electrification and sustainable transportation policies. In October 2019, the governor and the state's Public Service Commission launched a multiyear stakeholder initiative and proceeding called MI Power Grid, which will work on new technologies, pilots, and utility business models in order to optimize the transition to a clean energy grid.

NORTHEAST

Leading state: Driven by the strength of a robust policy framework under the state's 2008 Green Communities Act, Massachusetts continues to deliver nation-leading levels of utility savings alongside strong building energy codes that include provisions for solar readiness. In recent years the state has taken major steps to better align energy efficiency with its climate goals. These steps include incentives for homeowners who switch from oil and propane furnaces to electric heat pumps, measures to reduce winter and summer peak

demand, and the creation of a Clean Peak Standard, which gives credits for clean energy delivered during hours of peak demand.

State to watch: New Jersey marked a critical milestone in its efforts to scale up energy efficiency and deliver on robust energy savings goals established under its 2018 Clean Energy Act. The state's Board of Public Utilities issued an order establishing a framework of programs, including five-year targets that ramp up electric and gas savings to some of the highest levels in the nation. This order also seeks to ensure that low-income customers have equitable access to energy efficiency programs by calling for specific provisions and enhanced incentives that serve their communities. These programs, planned for June of 2021, will work in parallel with Governor Phil Murphy's recently released economy-wide Energy Master Plan (EMP), which lays out a pathway to 100% clean energy by 2050.

SOUTH

Leading state: Virginia was among the top energy stories of 2020, creating its first-ever clean energy standard and becoming the first state in the Southeast with a 100% clean electricity goal. The Virginia Clean Economy Act also established an energy efficiency resource standard that sets multiyear electric savings targets for utilities and includes important measures to support low-income customers and reduce energy burdens. The governor also signed HB 981, making Virginia the first southern state to join RGGI, with proceeds going toward energy efficiency, renewable energy, and climate mitigation measures.

State to watch: Although North Carolina ranks about midway down the *Scorecard* (tied for 27th), its utilities report some of the highest levels of electric savings in the Southeast. The state is also exploring new opportunities to strengthen both its energy efficiency programs and its adoption of electric vehicles. In 2019, in partnership with the Nicholas Institute at Duke University, the state released the North Carolina Energy Efficiency Roadmap to help achieve its energy savings potential and the goals of its Clean Energy Plan.

Southwest

Leading state: Utility savings continue to climb higher in Colorado in response to the strong efficiency goals set by Xcel Energy, the state's largest utility. State policymakers have been busy advancing plans that will address statewide climate goals signed last year, which target a 90% reduction in GHGs by 2050 (HB19-1261). These efforts have included new appliance and water efficiency standards, measures to strengthen local building energy codes, and plans to scale up utility investments to promote in EV infrastructure and adoption. In September, Governor Jared Polis released a draft GHG Pollution Reduction Roadmap with near-term actions to meet the state's 2030 and 2050 climate goals.

State to watch: Arizona and its utilities have been regional leaders in energy efficiency, delivering among the strongest levels of savings in the Southwest. However, the state is at an important turning point with its utility efficiency programs: in November 2020, the Arizona Corporation Commission decided to extend and expand the state's current energy efficiency resource standard (EERS) and set a 100% carbon-free electricity standard. The final vote to adopt these new rules is expected in 2021.

WEST

Leading state: California's enduring leadership on building energy codes, vehicle emissions, and appliance standards continues to set the pace in advancing energy efficiency on a variety of fronts at the national level and among other states who model their own policies after California's example. More than a dozen states have adopted California's low-emissions vehicle regulations, and 11 other states have adopted its zero-emissions vehicle program. A September Executive Order signed by Governor Gavin Newsom called for phasing out the sale of gasoline-powered vehicles by 2035, the most ambitious clean-car policy in the United States. In addition, the state's energy code is one of the most aggressive in the country and has been a powerful vehicle for advancing energy efficiency standards for building equipment.

State to watch: Washington made headlines in 2019 by passing an ambitious slate of climate legislation, including a law requiring that 100% of the state's electricity come from clean energy sources by 2045. Electric utilities have set biennial savings targets for the past 10 years, and in 2019 the state passed legislation (HB 1257)—expected to take effect in 2022—to also develop natural gas savings targets. The state legislature passed HB 1257 in 2019, the first statewide adoption of an energy performance standard for large commercial buildings (set to take effect in 2021). In 2019 lawmakers passed HB 1444, a comprehensive set of energy and water efficiency standards, including federal appliance and light bulb standards to protect against rollbacks.

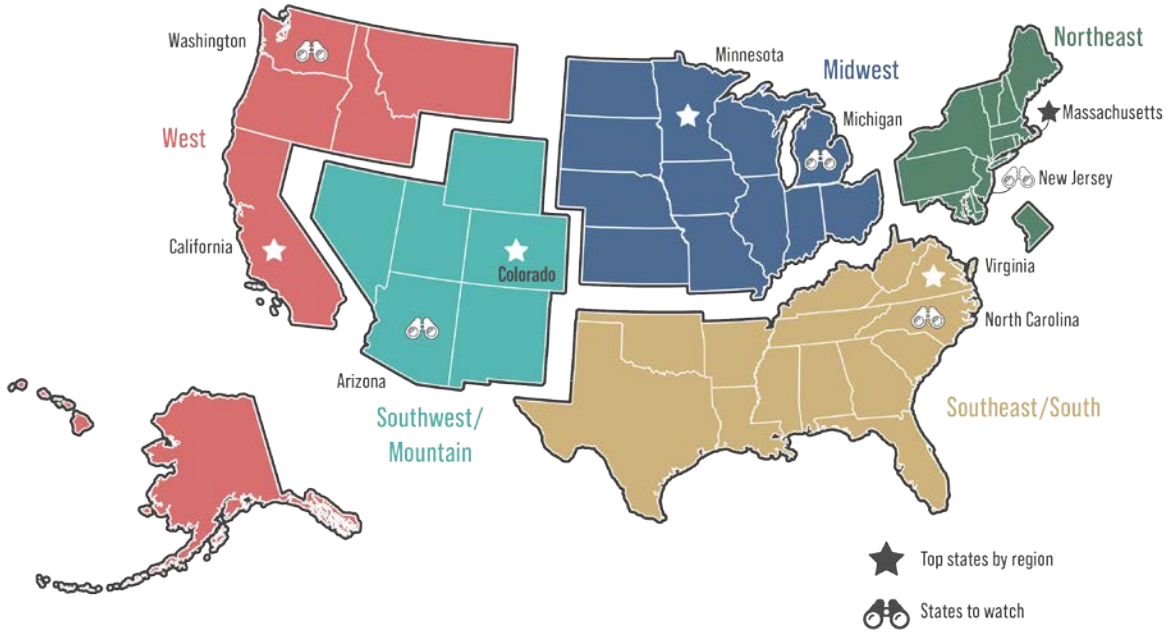

Figure ES2. *2020 State Scorecard* regional rankings

LOOKING AHEAD: EQUITY IN STATE AND UTILITY PLANNING AND PROGRAMS

An integral area of focus for ACEEE is the advancement of social equity principles in clean energy and efficiency planning, policy, and program design. Historically, energy efficiency initiatives have typically failed to adequately serve and represent marginalized groups,

particularly neighborhoods whose residents are predominantly Black, Indigenous, and/or people of color, as well as low-income customers, immigrants, and people with disabilities. These individuals often face disproportionately high energy burdens, meaning they spend a larger percentage of their income on energy bills than do their counterparts.[5] Furthermore, their underrepresentation within clean energy policymaking and planning means that many of the benefits of these policies do not equitably reach all communities.

While the *State Scorecard*'s current scoring methodology considers multiple state policies to address low-income household access to and participation in energy efficiency programs, ACEEE is committed to highlighting and encouraging broader efforts to embed equity in clean energy policymaking. This year we continue to award a point for supportive low-income utility efforts in Chapter 2 (utility policies) and a half-point for policies to address equitable access to public transportation in Chapter 3 (Transportation). Still, states can do much more to ensure that policy and program outcomes are equitable. These efforts are perhaps more important now than ever as states and local communities wrestle with the impact of the COVID-19 pandemic, which has been especially devastating for communities of color. The benefits of energy efficiency, including job creation, reduced energy bills, and healthy homes, will be critical to a successful economic recovery.

In addition to increasing investments in and access to clean energy in historically underinvested low-income communities and communities of color, emerging state efforts are underway also to address equity in community engagement, decision making, and workforce development initiatives. Examples include conducting state-level needs assessments and barrier analyses and establishing internal protocols and metrics to evaluate the equity of policy outcomes. Policymakers and stakeholders can also work to address gaps in worker skills and offer trainings, job placement, and job access strategies to help bring marginalized groups into the clean energy workforce.[6]

To gather information on state efforts to better address the needs of historically overlooked customers, this year's *Scorecard* data collection effort included new questions related to equity in energy planning, decision making, and clean energy job training. While we have yet to formally integrate these data and principles within our scoring framework, we have included this information in a new section in ACEEE's State and Local Policy Database titled "Equity Metrics and Workforce Development."[7] We hope this information can serve as an important resource for policymakers, utilities, and clean energy and community advocates seeking to identify leading examples and help equitably extend the benefits of energy efficiency to all households.

[5] A. Drehobl, L. Ross, and R. Ayala. 2020. *How High Are Household Energy Burdens? An Assessment of National and Metropolitan Energy Burdens across the U.S.* (Washington, DC: ACEEE, 2020).

[6] M. Shoemaker and D. Ribeiro. 2018. *Through the Local Government Lens: Developing the Energy Efficiency Workforce*. (Washington, DC: ACEEE, 2018); M., Shoemaker, R. Ayala, and D. York. 2020. *Expanding Opportunity through Energy Efficiency Jobs: Strategies to Ensure a More Resilient, Diverse Workforce*. (Washington, DC: ACEEE, 2020).

[7] See database.aceee.org/state/equity-workforce.

STRATEGIES FOR IMPROVING ENERGY EFFICIENCY

A variety of policy tools and program designs are available to state officials to scale up energy savings across multiple use sectors, in turn delivering immense carbon savings to help meet U.S. climate goals. These programs also provide an important opportunity to support economic recovery from COVID-19 by helping to reduce home and business energy bills, generate employment, and lessen the need for imported 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 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. They serve as an enabling framework for cost-effective investment, savings, and program activity. As states address evolving priorities such as decarbonization, cost, equity, and grid value, regulators in places like Massachusetts and New York are adjusting targets to incorporate multiple goals (e.g., fuel-neutral savings) that better align efficiency programs with electrification and GHG reduction objectives.

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

Adopt California tailpipe emissions standards and set quantitative targets for reducing vehicle miles traveled (VMT). Transportation consumes almost 30% of the total energy used in the United States and therefore offers an important opportunity to reduce carbon emissions.[8] At the state level, a comprehensive approach to transportation energy efficiency must address both individual vehicles and the entire transportation system. A variety of state-level policy options are available to improve transportation system efficiency. These include codifying targets for reducing VMT and integrating land use and transportation planning to create communities where people have access to multiple modes of travel and need not rely on owning personal vehicles. While federal fuel economy standards are expected to go a long way toward reducing fuel consumption, standards for model years 2022–2025 face an uncertain future following the April 2020 release of federal rollbacks. 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 customers, especially households overburdened by energy costs. Historically marginalized groups have been underserved and underrepresented in

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

clean energy planning and policymaking. States can foster equity in key decision-making processes by ensuring these efforts are inclusive and designed with all communities in mind. These 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 to 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 and public utility commissions (PUCs) can also include goals specific to the low-income sector, either within an EERS or as a stand-alone minimum acceptable threshold, to ensure investments are targeted toward these customers.

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

Adopt updated, energy-efficient building energy codes, improve code compliance, and involve efficiency program administrators in code support. Buildings use more than 40% of the total energy consumed in the United States, making them an essential target for cutting energy waste and emissions.[9] Routinely updating and strengthening building energy codes for new construction is one way to ensure a minimum level of energy efficiency for new residential and commercial buildings. Additional strategies such as energy performance standards for existing buildings, benchmarking and transparency policies, and financing tools to encourage deep retrofits are also critical for improving efficiency in the existing building stock and reducing building carbon emissions.

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

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

[9] U.S. Energy Information Administration. "How Much Energy Is Consumed in U.S. Buildings," June 15, 2020. eia.gov/tools/faqs/faq.php?id=86&t=1.

implementation of financing programs. A growing number of states are seeking new ways to maximize the impact of public funds and invigorate energy efficiency by attracting private capital through emerging financing models such as Property Assessed Clean Energy programs and green banks.

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

Adopt cost-effective efficiency standards for appliances, equipment, lighting, and plumbing products. State appliance standards are a proven policy that lowers utility bills for customers and businesses, reduces pollution, and helps spur national standards. Even when standards are not adopted at the federal level, adoption by just a few states can be enough to impact national markets. The Appliance Standards Awareness Project has recently 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.[10]

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

[10] 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: Weston Berg

The *State Energy Efficiency Scorecard*, now in its 14th edition, ranks states on their policy and program efforts. 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.

Although prices for renewable electricity continue to decline, energy efficiency remains our nation's least-cost energy resource while delivering a variety of other benefits such as grid reliability and resilience. States reported utility spending on energy efficiency amounting to roughly $8.4 billion in 2019. Electricity savings levels remained fairly consistent with those reported last year, totaling about 26.9 million megawatt-hours (MWh), enough to power almost 2.6 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 infrastructure, zero-energy buildings, and in some cases electrification of space and water heating.

While 2020 savings were not yet available for this report, future data will undoubtedly show the damaging impact that the COVID-19 pandemic had on programs this year, disrupting progress at all levels of policy and causing significant job losses across the clean energy industry. In the months prior to the first impacts of the pandemic, energy efficiency proved to be a strong job creator, supporting at least 2.4 million jobs across the nation. By the summer, however, the pandemic had caused the loss of 400,000 efficiency jobs and created uncertainty across the industry.

Despite these challenges, states from coast to coast made progress on energy efficiency. As regulators and program administrators worked to redirect resources to those hardest hit, work continued on a number of important clean energy bills and rulemakings, including important efficiency-related policy achievements in New Jersey, Virginia, New York, and Massachusetts. Moreover, as the nation remains mired in a global health crisis and its economic impacts, a number of states are recognizing the important role energy efficiency can play in leading the recovery 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 seven chapters. This chapter discusses our scoring methodology (including changes made since last year), presents the overall results of our analysis, and introduces several strategies states can use to improve their energy efficiency. It also spotlights leading states, most-improved states, and policy trends underlying the rankings.

Subsequent chapters present detailed results for five 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 deals with state government initiatives, including financial incentives, lead-by-example policies, and energy efficiency–focused research and development (R&D). Chapter 6 discusses appliance and equipment efficiency standards.

The final chapter summarizes major policy highlights and setbacks occurring since the release of the last *Scorecard* and describes data limitations we encountered in our research. We also describe developing trends in energy efficiency we hope to address with new metrics in future *Scorecard*s.

SCORING

States are the testing grounds for policies and regulations. To reflect the enormous diversity of the United States, we chose metrics flexible enough to capture the range of policy and program options that states use to encourage energy efficiency. The policies and programs evaluated in the *State Scorecard* aim to reduce end-use energy consumption, set long-term commitments for energy efficiency, and establish mandatory performance codes and standards. They also help to accelerate the 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 five primary policy areas in which they are pursuing energy efficiency:

- Utility and public benefits programs and policies[1]
- Transportation policies
- Building energy efficiency policies
- State government–led initiatives around energy efficiency
- Appliance and equipment standards

We allocated points among the policy areas to reflect the relative magnitude of energy savings possible through the measures scored. We relied on our analysis of scholarly work and the judgment of ACEEE staff and outside experts about the impact of state policies on energy efficiency in the sectors we covered. A variety of cross-sector potential studies have informed our understanding of the energy savings available in each policy area and have led to ongoing refinements in our scoring methodology (Geller et al. 2007; Neubauer et al. 2009, 2011; Eldridge, Elliott, and Vaidyanathan 2010; Molina et al. 2011; Hayes et al. 2014).

Of the 50 total points possible, we allocated 20 points (40%) to utility and public benefits program and policy metrics, 12 points (24%) to transportation policies and programs, 9 points (18%) to building energy efficiency policies, 6 points (12%) to state-led initiatives (such as lead-by-example programs and state-sponsored incentives), and 3 points (6%) to state appliance and equipment standards.

Within 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

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

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 2020. However, some performance-based scoring categories, such as those in Chapter 2 (utility programs), are informed by the latest available data from 2019 program years.

Table 1 outlines the scoring.

Table 1. Scoring by policy area and metrics

Policy areas and metrics	Maximum score	% of total points
Utility and public benefits programs and policies	20	40%
Incremental savings from electricity efficiency programs	7	14%
Incremental savings from natural gas and fuels efficiency programs	3	6%
Spending on electricity efficiency programs	2.5	5%
Spending on natural gas efficiency programs	1.5	3%
Large-customer opt-out programs*	(–1)	NA
Energy efficiency resource standards (EERS)	3	6%
Performance incentives and fixed-cost recovery	2	4%
Support of low-income energy efficiency programs	1	2%
Transportation policies	12	24%
GHG tailpipe emissions standards	1.5	3%
Electric vehicle (EV) registrations	1	2%
EV fees	1	2%
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%
Complete streets policies	0.5	1%
Transit funding	1	2%
Transit legislation	0.5	1%
Freight system efficiency goals	1	2%
Equitable transportation policies	1	2%
Building energy efficiency policies	9	18%
Level of code stringency	4	8%
Code compliance study	1	2%
Code enforcement activities	1	2%

Policy areas and metrics	Maximum score	% of total points
Energy transparency policies	1	2%
Residential energy labeling	0.5	1%
Existing buildings standards	1	2%
Zero-energy buildings	0.5	1%
State government initiatives	6	12%
Financial incentives	2.5	5%
Lead-by-example efforts in state facilities and fleets	2	4%
Carbon pricing	1.5	3%
Appliance and equipment efficiency standards	3	6%
Maximum total score	50	100%

* We deducted 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. We do not envision that the allocation of points will forever remain the same; rather, we will continue to adjust our methodology to reflect the current energy efficiency policy and program environment. Point allocations can change both within and across policy categories. This year we shifted points to both the transportation and buildings chapters to accommodate new metrics recognizing state progress on electric vehicle adoption and zero-energy buildings, as well as to credit states adopting efficiency standards for existing buildings. As part of this shift, we removed the chapter dedicated to policies addressing combined heat and power (CHP) technologies. This removal is no way intended to diminish the important carbon benefits of CHP, especially with regard to the efficient use of natural gas. We note that CHP savings reported by utility programs continue to be counted in Chapter 2 of the *Scorecard*. In the long run, CHP remains an important tool for displacing fossil fuel emissions; however, its value in reducing emissions varies by state, depending on the grid mix in each. We give further detail on these changes later in this chapter and discuss them in more depth in the relevant policy chapters.

Changes in future editions of the *Scorecard* could include further revisions to point allocations and the addition or subtraction of entire categories of scoring. In making these changes, we seek to faithfully represent states' evolving efforts to realize the potential for energy efficiency in the systems and sectors of their economies.

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. Thirty-five state commissions responded.

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

We received responses from energy offices in 38 states. In addition, 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).[2] We also asked them to review and provide comments on a draft version of this *Scorecard* prior to publication. We used publicly available data and responses from prior years to evaluate states that did not respond to this year's data request or requests for review.

Best-Practice Policy and Performance Metrics

The scoring framework described above is our best attempt to represent our more than 32 efficiency metrics as a quantitative score. Converting spending data, energy savings data, and policy adoption metrics spanning five policy areas into one score clearly involves some simplification. Quantitative energy savings performance metrics are confined mostly to programs run by utilities and statewide or third-party administrators using ratepayer funds. These programs are subject to strict evaluation, measurement, and verification 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 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 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, electric vehicle (EV) registrations, reductions in vehicle miles traveled (VMT), and a recently introduced metric for number of publicly available electric vehicle charging stations all represent measurable results of transportation policies. We include a full discussion of the policy and performance metrics in each chapter.

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) generally fall outside the scope of this report. 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* (Ribeiro et al. 2020) 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

[2] Available at database.aceee.org.

(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 outside of customer-funded or government-sponsored energy efficiency initiatives, codes, or standards. We do 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. In cases in which this information was made available, we have included it in Appendix L.

THIS YEAR'S CHANGES IN SCORING METHODOLOGY

We updated our scoring methodology in several policy areas this year to reflect the changing policy landscape. Specifically, we recognize increasing efforts by states to support vehicle electrification and promote zero-energy buildings as strategies to improve efficiency and reduce emissions. We should note also that our methodology development and data collection for this report occurred in the winter and spring of 2020 as the initial impacts of the COVID-19 pandemic were still being understood. As a result, our scoring assessment does not directly address changes to efficiency policies or programs or stimulus efforts that states may have made to adapt or strengthen programs in response to the crisis.

Past *Scorecard*s have considered state EV registration rates and have awarded points to the 12 states currently administering California's Zero-Emission Vehicle (ZEV) program. This year we have added two additional EV-related scoring categories to Chapter 3 to capture policies that help accelerate the adoption of electric vehicles. One new metric tracks the number of publicly available charging stations per capita. While states can prioritize various channels and policies to increase investment in EV charging infrastructure, we hope that by using an outcome-based count of available chargers we can provide an objective assessment of state success in this area. The other new scoring category considers the stringency of EV fees assessed by states in an effort to recoup lost gasoline-tax revenues. While it makes sense for all vehicle owners to contribute to the maintenance of the roads they drive on, we deducted points for states with inordinately high surcharges that disincentivize EV uptake.

We have also updated our chapter on buildings policies, with two new metrics that credit states leading the way in targeting energy waste in existing buildings and paving the way for zero-energy buildings (ZEBs). While building energy codes address efficiency in new construction, a number of jurisdictions, particularly at the city level, have set energy performance standards to drive change in the existing building stock. In 2019 Washington State became the first to adopt such a standard at the state level as part of its Clean Buildings Act and is thus the first to earn a point in this important new *Scorecard* metric. Also, a growing number of states, through codes and other incentives, are prioritizing construction of ZEBs—buildings that produce at least as much energy as they consume—as a strategy to rapidly reduce emissions. Using data from the New Buildings Institute, our

other new metric is based on the number of verified and emerging ZEBs constructed in each state. To accommodate these changes, we removed a previous metric that credited states for requiring code officials to complete energy efficiency–related training and certification.

In addition, this year we removed our chapter on CHP-supportive policies. While CHP serves an important energy-saving role, especially in industrial applications, by recovering heat that would be wasted otherwise, our decision was based on feedback from states, some of which noted that the future role of CHP as a clean energy resource has grown more complex and variable depending on local grid energy mixes. The chapter's removal will also avoid penalizing states in which higher levels of zero-emission resources make CHP less attractive as a policy priority. We note, however, that savings from CHP are already counted to some degree in Chapter 2, to the extent that they are captured in utility savings reporting.

In Chapter 6, which evaluates state government–led initiatives, we refined our carbon metric, first introduced last year to recognize states aligning energy efficiency programs with statewide climate and emissions goals. Last year's *Scorecard* credited those states supporting energy efficiency programs through proceeds from carbon pricing policies (primarily through the Regional Greenhouse Gas Initiative and California's cap-and-trade program). We have built on this with two new metrics, one crediting states that are actively tracking greenhouse gas (GHG) emissions avoided through energy efficiency programs, the other crediting those that consider the avoided carbon benefits of efficiency in assessing the cost effectiveness of utility energy savings programs. To accommodate these additions, we retired a previous metric tracking state-sponsored R&D programs with a focus on energy efficiency because most states were earning points and it was no longer a useful differentiator. However, we do continue to include this information in ACEEE's State and Local Policy Database (ACEEE 2020b).

2020 STATE ENERGY EFFICIENCY SCORECARD *RESULTS*

We present the results of the *State Scorecard* in figure 1 and describe them more fully in table 2. In this section, we also highlight some key changes in state rankings, discuss which states are making notable new commitments to energy efficiency, and provide recommendations for states wanting to increase their energy efficiency.

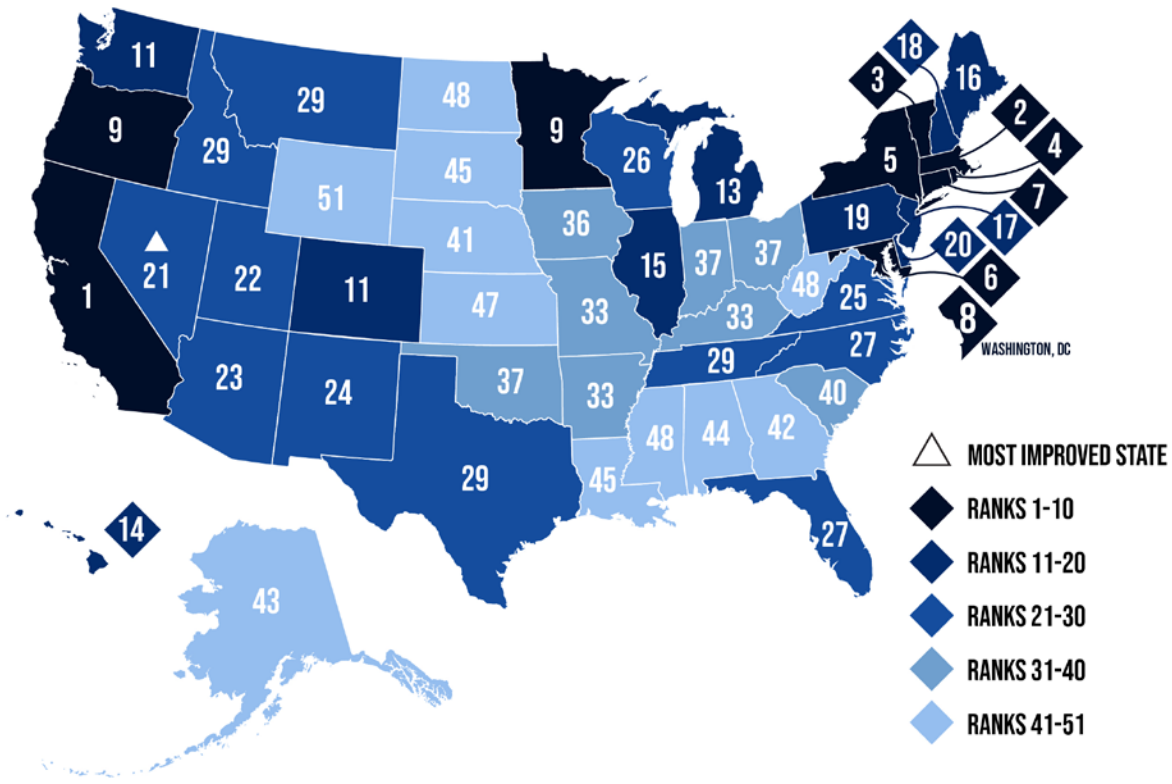

Figure 1. *2020 State Scorecard* rankings

Table 2. Summary of state scores in the *2020 State Scorecard*

Rank	State	Utility and public benefits programs & policies (20 pts.)	Trans-portation policies (12 pts.)	Building energy efficiency policies (9 pts.)	State government initiatives (6 pts.)	Appliance efficiency standards (3 pts.)	**TOTAL SCORE (50 pts.)**	Change in rank from 2019	Change in score from 2019
1	California	16	10.5	7.5	6	3	43	1	–0.5
2	Massachusetts	19.5	10	7	6	0	42.5	–1	–2
3	Vermont	17.5	8.5	6	6	2	40	0	–0.5
4	Rhode Island	19.5	8	6	6	0	39.5	–1	–1
5	New York	13.5	10.5	6.5	5.5	0.5	36.5	0	–0.5
6	Maryland	13.5	9.5	6	5.5	0	34.5	1	0
7	Connecticut	12.5	8.5	6.5	6	0	33.5	–1	–3
8	District of Columbia	9.5	11	8.5	4	0	33	3	4
9	Minnesota	13	7	6.5	5.5	0	32	–1	–0.5
9	Oregon	11	8.5	7	5.5	0	32	0	0
11	Colorado	9.5	7.5	6	5.5	2	30.5	3	3.5
11	Washington	7.5	8.5	7.5	5	2	30.5	–1	–1
13	Michigan	13	5.5	6.5	3.5	0	28.5	0	0
14	Hawaii	11	6	7	2.5	1.5	28	2	2.5
15	Illinois	12	5	6	4	0	27	–4	–2
16	Maine	9	7.5	4.5	5.5	0	26.5	–1	0.5
17	New Jersey	8.5	7	6.5	3	0	25	0	1
18	New Hampshire	10	3.5	5.5	5.5	0	24.5	2	3.5
19	Pennsylvania	4	6.5	6.5	5	0	22	–1	–1.5
20	Delaware	3.5	6.5	5.5	6	0	21.5	1	1
21	Nevada	5	4	6.5	4.5	1	21	5	5.5
22	Utah	6.5	4.5	6	3.5	0	20.5	0	1
23	Arizona	8.5	5	4.5	2	0	20	–4	–1.5
24	New Mexico	6.5	3.5	4.5	4	0	18.5	9	4.5
25	Virginia	1.5	6	5.5	5	0	18	4	3
26	Wisconsin	7.5	2.5	3	4	0	17	–1	1
27	Florida	1.5	5	6	4	0	16.5	–3	0
27	North Carolina	3	4.5	5	4	0	16.5	–1	1
29	Idaho	6	1	5.5	2	0	14.5	1	0
29	Montana	3.5	2.5	5.5	3	0	14.5	7	2
29	Tennessee	1	5	3.5	5	0	14.5	1	0
29	Texas	1	3.5	6.5	3.5	0	14.5	–3	–1
33	Arkansas	7	0	3	3.5	0	13.5	0	–0.5
33	Kentucky	1.5	3	5	4	0	13.5	5	2.5
33	Missouri	2.5	3	4	4	0	13.5	–3	–1
36	Iowa	4	3.5	4	1	0	12.5	–13	-6
37	Indiana	4	3	3	1.5	0	11.5	3	1
37	Ohio	4	0.5	3.5	3.5	0	11.5	–4	–2.5
37	Oklahoma	4	3.5	1.5	2.5	0	11.5	0	–0.5
40	South Carolina	2	2.5	2.5	4	0	11	0	0.5
41	Nebraska	0.5	2	6	2	0	10.5	2	1
42	Georgia	2	1.5	4.5	2	0	10	–4	–1
43	Alaska	1	3.5	1.5	3.5	0	9.5	–3	–1
44	Alabama	0	0.5	5.5	3	0	9	–1	–0.5
45	Louisiana	0.5	3	2	2.5	0	8	3	1.5
45	South Dakota	2	2	3.5	0.5	0	8	1	1
47	Kansas	0.5	2	3.5	1	0	7	–1	0
48	Mississippi	2	0.5	0.5	2.5	0	5.5	–3	–2.5
48	North Dakota	0	2	3	0.5	0	5.5	2	0.5
48	West Virginia	–1	1	4	1.5	0	5.5	0	–1
51	Wyoming	1	0.5	0	2.5	0	4	0	–0.5

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. Relatively few points separate states' total scores in the middle tiers: just 6.5 points in the third tier and 2.5 points in the fourth. These middle tiers also have a significant number of states tied in the rankings. For example, in the third tier, Idaho, Montana, Tennessee, and Texas are tied for 29th. Small improvements in energy efficiency will likely have a significant effect on the rankings of states in the middle tiers. Conversely, idling states will easily fall behind as other states in this large group ramp up their efficiency efforts.

The top tier exhibits more variation in scoring, stretching across an 11-point range. California, Massachusetts, and Vermont were the only states scoring 40 or more points this year. Others in the top tier are also well-established high scorers. Generally speaking, the highest-ranking states have all made broad, long-term commitments to energy efficiency, 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.

2020 Leading States

California returned to first place this year, its fifth time taking the top spot since the *Scorecard*'s inception in 2007 and a feat it last accomplished in 2016, when it tied with Massachusetts. For its part, the Bay State followed just a half-point behind to take second place. Massachusetts continues to lead on multiple fronts, including with advanced efforts to integrate efficiency with state electrification and decarbonization strategies, currently seen in only a handful of states.

California's enduring leadership on building energy codes, vehicle emissions, and appliance standards continues to set the pace in advancing energy efficiency on a variety of fronts—not just within the state's borders but at the national level. Other states have modeled their own policies after California's example, with more than a dozen states adopting its low-emissions vehicle regulations and 11 implementing its zero-emission vehicle program. Together with California, these states have created an important unified front against ongoing federal efforts to revoke states' ability to set stricter vehicle standards. California's other pivotal achievements this year included expanded investment in high-efficiency heat pump water heaters (HPWHs), along with updates to the state's building energy code to award compliance credits to builders for adoption of smart HPWHs in recognition of their unique benefits toward slashing emissions and providing demand flexibility. The state also continued to maintain progress on important appliance standards, notably expanding the scope of its strong light bulb standards last November in the face of federal efforts to reverse course on similar national standards.

Driven by the strength of a robust policy framework under the state's 2008 Green Communities Act, **Massachusetts** continues to deliver nation-leading levels of utility savings alongside comprehensive programs and policies to strengthen efficiency in the buildings and transportation sectors. Among these policies are incentives for electric vehicles and strong building energy codes based on the 2018 International Energy Conservation Code (IECC), including strengthening amendments for solar readiness. In

recent years the state has taken major steps to better align energy efficiency with emissions reduction goals under its Global Warming Solutions Act. For instance, it has made policy revisions to enable strategic electrification through measures that switch homeowners from oil and propane furnaces to electric heat pumps, and it has launched incentives to reduce winter and summer peak demand. Other major policy advances this year include instituting a Clean Peak Standard, crediting clean energy delivered during hours of peak demand.

Vermont continued its now seven-year streak in the *Scorecard* top five. The state's energy efficiency resource standard is among the strongest in the nation, consistently delivering utility savings exceeding 2% of sales. Vermont is also among the states that have passed legislation (H 410) putting national appliance and light bulb standards into state law in order to protect against federal rollbacks. In addition, H 410, signed in 2018, established efficiency standards for 16 appliances not covered at the federal level, which are expected to cumulatively save consumers $210 million by 2035 and help meet the state's carbon emissions goals. The Green Mountain State has also maintained progress on buildings efficiency, adopting the 2018 IECC and ASHRAE Standard 90.1-2016 as part of an update to its residential and commercial building energy standards, which took effect this year.

Rhode Island ranks fourth this year, thanks to the success of its nation-leading utility savings targets and a mandate to procure all cost-effective energy efficiency.[3] Building decarbonization has been a growing priority for the state in recent years, with the introduction of voluntary stretch codes for construction and renovation projects in 2018 and ongoing support of zero-energy buildings. The state is also targeting energy efficiency among delivered-fuels customers, an often overlooked sector, and this year released a heating sector transformation report identifying solutions to reduce emissions through renewable fuels and a transition to electric ground source or air source heat pumps.[4] The state has also leveraged utility-led efficiency programs as a means to enhance the workforce through targeted training and recruitment opportunities, helping to increase the state's clean energy workforce by 25% since 2015. Rhode Island has also collaborated with Northeast Energy Efficiency Partnerships to increase the visibility of home energy data. In addition, the state leads by example with clear energy goals established for state agencies.

New York rounds out the top five for the second straight year. The state's utilities and energy community worked to update policies and programs to meet ambitious goals to achieve a net-zero carbon economy under the 2019 Climate Leadership and Community Protection Act (CLCPA). In January the state's Public Service Commission issued an order setting ambitious energy efficiency and building decarbonization targets in pursuit of the state goal to achieve 185 TBtus of savings by 2025. The state's efficiency goals are notable for being among the first in a next generation of fuel-neutral energy efficiency resource standards that integrate beneficial electrification and include a separate heat pump target.

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[3] "All cost-effective" requirements call on utilities to determine and invest in the maximum amount of cost-effective efficiency feasible. States use a variety of methods and assumptions for determining cost effectiveness, which will influence calculations of potential savings.

[4] Delivered fuels include fuel oil, kerosene, propane, and wood. Also referred to as "unregulated fuels," these are commonly not subject to utility energy efficiency rules, and savings associated with delivered fuels have historically not been tracked in most cases.

Also going into effect this year was NYStretch Energy Code 2020—the state's first voluntary, locally adoptable stretch code, providing savings of roughly 11% over the state's base code. Other recent achievements include the release of a new state freight plan with efficiency performance measures, as well as the signing of a bill in late 2019 strengthening efficiency standards for faucets, showerheads, and other plumbing fixtures.

States rounding out the top 10 are Maryland, Connecticut, the District of Columbia, Minnesota, and Oregon. 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.

Table 3 shows the number of years that states have been in the top 5 and top 10 spots in the *State Scorecard* rankings since their inception in 2007.

Table 3. Leading states in the *State Scorecard*, by years at the top

State	Years in top 5	Years in top 10
California	14	14
Massachusetts	13	14
Vermont	12	14
Oregon	10	14
New York	9	14
Connecticut	6	14
Rhode Island	8	13
Washington	1	13
Minnesota	0	13
Maryland	0	10
Illinois	0	2
Maine	0	2
New Jersey	0	2
District of Columbia	0	1
Wisconsin	0	1

Since the first edition of the *State Scorecard,* eight states have occupied the top 5 spots, and 14 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 14 years, followed by Massachusetts for 13 years and Vermont for 12. New Jersey, Washington, Wisconsin, Illinois, and Maine have all placed in the top 10 in the past, but none scored high enough to rank in the top tier this year.

Changes in Results Compared with *The 2019 State Energy Efficiency Scorecard*

Overall, 20 states and the District of Columbia had higher total scores and 23 states had lower total scores this year compared with last year's *Scorecard*. Seven states had no change in score.[5] Table 4 shows point gains and losses in greater detail.

Table 4. Number of states gaining or losing points compared with 2019, by policy area

Policy category	States gaining points		No change		States losing points	
Utility and public benefits	14	27%	22	43%	15	29%
Transportation*	41	80%	3	6%	7	14%
Building energy codes	21	41%	21	41%	9	18%
State government initiatives	14	27%	21	41%	16	31%
Appliance standards	2	4%	47	92%	2	4%
Total score	21	41%	7	14%	23	45%

Percentages may not total 100 due to rounding. *Due to an adjustment to the scoring methodology that reallocated points from the discontinued CHP chapter to transportation and buildings policies, a relatively high number of states saw significant point gains in these categories.

The fact that 23 states lost points this year should not necessarily be interpreted as a sign that they are losing ground. Given the number of metrics in the *State Scorecard* and states' varying efforts, movement should be expected. The landscape for energy efficiency is in constant flux, and changes in state scores reflect a variety of factors. These include adjustments to our *Scorecard* methodology this year to reflect emerging state policies such as those supporting expansion of electric vehicle charging infrastructure, zero-energy construction, and alignment of efficiency policies with broader state decarbonization goals.

Leaving aside methodology, the number of states losing points this year does not indicate a lack of nationwide progress. On the contrary, several states, including Massachusetts, New Jersey, New Mexico, New York, and Virginia, have renewed, extended, or strengthened energy efficiency targets to help lay the groundwork for future savings. As mentioned earlier, savings from electric efficiency programs administered in 2019 totaled approximately 26.9 million MWh, equivalent to about 0.70% of total retail electricity sales in the United States. And this does not include ongoing savings from energy efficiency measures installed in earlier years that continue to save energy. Those savings amounted to more than 270 million MWh in 2019, approximately 7% of electricity consumption. More information on state scores for utility programs is included in Chapter 2.

Most-Improved States

Relative to last year, this year's most-improved state was **Nevada**. Also showing major improvement were New Mexico, Colorado, New Hampshire, the District of Columbia, and Virginia. All of these states added at least 3 points to their scores to move up in the rankings. Table 5 shows changes in points and rank compared with last year for these states.

[5] The *State Scorecard* looks at all 50 states and the District of Columbia, which is treated as a state under DOE Program Rule 10 CFR Part 420–State Energy Program.

Table 5. Changes from 2019 for most-improved states

	Change in score	Change in rank	2020 ranking	2019 ranking
Nevada	+5.5	+5	21	26
New Mexico	+4.5	+9	24	33
District of Columbia	+4	+4	8	11
Colorado	+3.5	+3	11	14
New Hampshire	+3.5	+2	18	20
Virginia	+3	+4	25	29

Following 2017 state legislation mandating energy efficiency savings targets, **Nevada** has advanced energy efficiency on multiple policy fronts. The governor also signed AB54 last year, adopting federal standards into law in order to protect against the current presidential administration's efforts to roll back energy-saving light bulb standards. The state has adopted the 2018 IECC for residential and commercial buildings, and it works with local governments to increase adoption and compliance. In June the state's environmental agency announced plans to adopt California's vehicle emission standards and Zero-Emission Vehicle (ZEV) mandate. The state also passed legislation in 2019 setting a goal for 100% carbon-free electricity by 2050.

The **District of Columbia** maintains a diverse suite of strong energy efficiency policies that helped propel it into the *Scorecard*'s top 10 this year. In 2019 the District passed the Clean Energy DC (CEDC) Act, the most ambitious renewable portfolio standard in the nation, with a commitment to transition to 100% renewable energy by 2032. The bill also expanded building benchmarking, created energy performance standards for existing buildings, and added funding to the District's new green bank. DC is also working to produce a Transportation Electrification Roadmap per the CEDC to shift its transportation sector from traditional fossil fuels to high-efficiency zero-emission vehicles and align with the District's overarching goal of becoming carbon neutral by 2050.

New Mexico moved forward on a number of important efficiency initiatives in the wake of a pivotal 2019 in which lawmakers signed the Energy Transition Act, committing public utilities to a zero-carbon electricity goal by 2045. Utilities are also strengthening efficiency programs in response to HB-291, which set a new 2025 target to achieve savings of 5% relative to 2020 sales, raised the cap on efficiency spending, and enabled decoupling, in effect removing the disincentive for utilities to save energy. Additionally, an executive order issued by the governor last year moved the state to replace its long-outdated energy codes for new construction with the latest 2018 IECC model codes, turning the corner for buildings sector efficiency. The governor has also called for the state's adoption of stronger fuel economy standards in 2020. And 2019 legislation requires public utilities to submit electric vehicle infrastructure plans by 2021.

Colorado continues to deliver strong levels of utility energy savings in response to more ambitious efficiency goals for Xcel Energy in recent years. Last year the state took a major step forward in strengthening efficiency in new construction with the adoption of HB 19-1260. The law requires local governments to adopt and enforce, at a minimum, one of the three most recent versions of International Code Council energy codes upon updating any other building code. Colorado has also adopted strict vehicle emissions standards aligned with those of California, joining 13 other states that have already done so and helping Colorado move toward its target of cutting greenhouse gas (GHG) emissions 26% by 2025. The state also has comprehensive appliance standards, which include protection against a federal rollback of lighting standards.

In **New Hampshire**, utility-sector savings have gradually ramped up in recent years since the state established its first energy efficiency resource standard in 2016. New Hampshire is also a member of the Regional Greenhouse Gas Initiative (RGGI), the regional cap-and-trade program designed to reduce emissions, and has directed roughly half of its RGGI auction proceeds toward energy efficiency since 2009. As of November 2020, utilities have also proposed significantly higher savings goals for 2021–2023, which could be approved by state regulators in December.

In **Virginia**, the governor's signing of the Virginia Clean Economy Act (VCEA) was a major contributor to the state's 3-point improvement. The VCEA is among the top energy stories of 2020, creating the commonwealth's first clean energy standard and making it the first state in the Southeast with a 100% clean electricity goal. The VCEA also established an energy efficiency resource standard that sets multiyear electric savings targets for utilities. To support low-income customers, it includes measures to reduce energy burdens and also establishes a Percentage of Income Payment Program (PIPP), which caps the monthly electric payment of low-income participants at 6% of income for those with gas heat or 10% for those with electric heat (Virginia General Assembly 2020). The governor also signed HB 981 to make Virginia the first southern state to join RGGI, with proceeds going toward energy efficiency, renewable energy, and climate mitigation measures. As the state's utilities design and administer new customer demand-side offerings to meet VCEA goals, we anticipate the state's *Scorecard* performance will continue to improve alongside the accrual of future savings.

States Losing Ground

Twenty-one states fell in the rankings this year due to factors such as greater progress by other states and changes to the scoring methodology in several categories, including the shifting of points toward the buildings and transportation categories. This loss of ground indicates the complex relationship between changes in total score and changes in rank. Of the 23 states that lost points, 16 fell in the rankings, 6 did not change, and 1 state, California, improved to first place despite a half-point loss. The fall in rank of several states may appear incommensurate with their relatively minor loss of points relative to last year. But given the number of metrics covered in the *State Scorecard* and states' differing efforts, relative movement among the states should be expected. As mentioned earlier, the difference among states' total scores, particularly in the middle tiers of the *State Scorecard*, is small; as a result, idling states can easily fall behind in the rankings as others ramp up efforts to become more energy efficient.

Iowa lost 6 points, falling 13 positions to 36th place, the steepest point loss and fall in rankings in 2020. Previously ranked 15th as recently as 2016, the Hawkeye State felt the impact of 2018 legislation that imposes a stifling spending cap on demand-side investment and allows customers to opt out of paying for programs that fail to pass the Ratepayer Impact Measure, a cost-effectiveness test that fails to account for societal savings benefits. The result was a steep drop-off in utility-reported electric and gas savings in 2019, moving Iowa into the bottom half of the *Scorecard*.

In general, we see three trends among the states losing ground in the *State Scorecard.* First, many of those falling behind are not increasing energy savings year after year 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.

Second, 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 savings achieved by utilities.

Finally, a handful of states, particularly Iowa and Ohio, have passed damaging legislation that has weakened or rolled back energy efficiency programs. For example, Ohio's HB 6, signed in 2019, effectively ended the state's energy efficiency resource standard and prohibits utility cost recovery for efficiency programs. This has led to the anticipated termination of energy efficiency programs statewide by the end of 2020, with the exception of some low-income weatherization programs. Ohio fell four places in this year's rankings, from 33rd to 37th place.

STRATEGIES FOR IMPROVING ENERGY EFFICIENCY

A variety of policy tools and program designs are available to state officials to strengthen efforts to save energy across multiple use sectors. The following list highlights examples of best practices by state policymakers seeking to improve energy efficiency performance by energy utilities, in the buildings and transportation sectors, and through appliance standards. We also highlight best practices that reduce legal and market barriers to investing in energy efficiency and expand participation in programs that achieve savings.

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

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

Adopt California tailpipe emissions standards and set quantitative targets for reducing VMT. Transportation consumes almost 30% of the total energy used in the United States (EPA 2020b). At the state level, a comprehensive approach to transportation energy efficiency must address both individual vehicles and the entire transportation system. A variety of state-level policy options are available to improve transportation system efficiency. These include codifying targets for reducing VMT and integrating land use and transportation planning to create sustainable communities with access to multiple modes of travel. While federal fuel economy standards are expected to go a long way toward reducing fuel consumption, standards for model years 2022–2025 face an uncertain future following the April 2020 release of federal rollbacks. States that adopt California's tailpipe emissions standards will lead the way toward clean, fuel-efficient vehicles.

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

Ensure energy efficiency and clean energy investments and opportunities are inclusive and that benefits accrue to all customers, especially households overburdened by energy costs. Historically marginalized groups have been underserved and underrepresented in clean energy planning and policymaking. States can foster equity in key decision-making processes by ensuring these efforts are inclusive and designed with all communities in mind. These 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 to 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 and public utility commissions (PUCs) can also include goals specific to the low-income sector, either within an EERS or as a stand-alone minimum acceptable threshold, to ensure investments are targeted toward these customers.

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

Adopt updated, more stringent building energy codes, improve code compliance, and involve efficiency program administrators in code support. Buildings use more than 40% of the total energy consumed in the United States, making them an essential target for energy savings. Adopting mandatory building energy codes is one way to ensure a minimum level of energy efficiency for new residential and commercial buildings. Strategies such as energy performance standards, benchmarking and transparency policies, and financing tools to encourage deep retrofits are also critical for addressing efficiency in the existing building stock.

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

Expand state government–led initiatives and make them visible. States can establish sustainable funding sources for energy efficiency incentive programs, invest in energy efficiency–related R&D and demonstration centers, and lead by example by incorporating

energy efficiency into government operations. In the latter area, they can reduce energy use in public buildings and fleets and use energy savings performance contracts (ESPCs) 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 program to promote energy efficiency in homes and buildings, expanding lender and customer participation has been an ongoing challenge. States can increase stakeholder awareness and pass legislation to address legal barriers to the implementation of financing programs. A growing number of states are seeking new ways to maximize the impact of public funds and invigorate energy efficiency by attracting private capital through emerging financing models such as PACE programs and green banks.

Examples: Colorado, Connecticut, Minnesota, Missouri, New York, 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 when standards are not adopted at the federal level, adoption by just a few states can be enough to impact national markets. The Appliance Standards Awareness Project has recently 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.[6]

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

[6] 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 2. Utility and Public Benefits Programs and Policies

Author: Weston Berg

INTRODUCTION

The utility sector is critical to implementing energy efficiency. Electric and natural gas utilities and independent statewide program administrators deliver a substantial share of electricity and natural gas efficiency programs in the United States.[17] These programs, funded by utility customers through utility rates and statewide public benefits funds, encourage customers to use efficient technologies and thereby reduce their energy waste. Energy efficiency is a resource—just as power plants, wind turbines, and solar panels are.

Utilities and administrators have been delivering energy efficiency programs and market transformation initiatives to customers for decades in some states, often driven by regulations from state utility commissions setting specific savings targets for residential, commercial, industrial, and income-qualified customers. And as a growing number of states have adopted increasingly ambitious clean energy goals, many are deploying energy efficiency integrated with controls as an important demand response and grid optimization resource to complement and facilitate the growing integration of renewable energy. ACEEE has also found that by scaling up energy efficiency across multiple end-use sectors, the United States can cut energy use and greenhouse gas emissions in half by 2050 (Ungar and Nadel 2019).

Utilities and administrators implement energy efficiency programs in all 50 states and the District of Columbia. Program approaches include financial incentives, such as rebates and loans; technical services, such as audits, retrofits, and training for architects, engineers, and building owners; behavioral strategies; and educational campaigns about the benefits of energy efficiency improvements. Utilities and administrators also continue to develop new and creative ways of delivering energy efficiency to their customers, including some customer segments that have been more difficult to serve, such as small businesses and multifamily housing occupants.

METHODOLOGY

For this chapter, we gathered statewide data on the following:

- Utility energy sales (electricity and natural gas) to customers in 2018 and 2019
- Utility revenues from retail energy sales in 2018 and 2019
- Number of residential natural gas customers in 2018
- Budgets for electricity and natural gas energy efficiency programs in 2019 and 2020
- Actual spending for electricity and natural gas energy efficiency programs in 2018 and 2019

[17] Other major programs, run by state governments, are discussed in Chapter 6. In addition, the U.S. Department of Energy (DOE) Weatherization Assistance Program (WAP), started in 1976, provides weatherization services to approximately 35,000 homes every year using DOE funds. More than $200 million was dedicated annually to the program in both FY 2016 and FY 2017, though these are not considered within the *State Scorecard* given the report's state-level policy scope.

- Incremental net and gross electricity and natural gas energy efficiency program savings in 2018 and 2019[18]
- Incremental net and gross energy savings of unregulated fuels including fuel oil, kerosene, wood, and propane, where available, in 2018 and 2019
- Policies and regulations to encourage utility investment in energy efficiency
- Utility policies and programs related to large customers, including self-direct and opt-out provisions
- Policies and levels of spending related to utility investment in low-income energy efficiency programs
- Data access policies and provisions[19]

We sourced our data from information requests completed by state utility commissions and from the EIA (EIA 2020a, 2020c, 2020d). We also gathered information from regional efficiency groups.[20] We sent the data we gathered, along with last year's *State Scorecard* data, to state utility commissions and independent administrators for review. Table 6 shows overall scores for utility programs and policies. Tables 8, 10, 12, and 14 provide data on electricity and natural gas efficiency program savings and spending in the most recent years for which data were available.

SCORING AND RESULTS

This chapter reviews and ranks the states on the basis of their performance in implementing utility-sector efficiency programs and enabling policies that are evidence of a commitment to energy efficiency. The eight utility scoring metrics are

- Incremental electricity program savings as a percentage of retail sales (7 points)[21]
- Incremental natural gas and unregulated fuels program savings as a percentage of residential and commercial sales (3 points)
- Electricity program spending as a percentage of statewide electric utility revenues (2.5 points)
- Natural gas program spending per residential gas customer (1.5 points)

[18] 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).

[19] We used this information from state responses to present best practices, not to develop scores.

[20] The six regional energy efficiency organizations (REEOs) are the Midwest Energy Efficiency Alliance (MEEA), Northeast Energy Efficiency Partnerships (NEEP), Northwest Energy Efficiency Alliance (NEEA), Southeast Energy Efficiency Alliance (SEEA), South-Central Partnership for Energy Efficiency as a Resource (SPEER), and Southwest Energy Efficiency Project (SWEEP). The REEOs work through funded partnerships with the U.S. DOE and with various stakeholders, such as utilities and advocacy groups, to provide technical assistance to states and municipalities in support of efficiency policy development, program design, and program implementation.

[21] ACEEE defines incremental savings as new savings from programs implemented in a given year. Incremental savings are distinct from cumulative 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.

- Opt-out provisions for large customers (–1 point)
- EERS for utilities and statewide program administrators (3 points)
- Utility business models that encourage energy efficiency, including performance incentives and revenue decoupling (2 points)
- Policies and utility funding in support of low-income energy efficiency programs (1 point)

In this category, a state could earn up to 20 points, or 40% of the 50 total points possible in the *State Scorecard*. We set this point allocation because the savings potential of utility and public benefits programs is approximately 40% of the total energy savings potential of all policy areas scored. Studies suggest that electricity programs typically achieve at least three times the primary energy savings of natural gas programs (Geller et al. 2007; Elliott et al. 2007a, 2007b; Eldridge et al. 2009). Utility-sector potential studies generally indicate significant untapped possible savings for natural gas efficiency programs (GDS 2013; Mosenthal et al. 2014; Nadel 2017; Minnesota DOC 2018). Therefore, we allocated 9.5 points to metrics for electricity programs measuring annual savings and spending and 4.5 points to metrics for natural gas and unregulated fuels programs measuring annual savings and spending. In an effort to recognize state policies and programs aimed at strengthening energy efficiency for low-income households—a sector that has historically experienced underinvestment due to policies of systemic social and economic exclusion—we introduced in the *2017 State Scorecard* a 1-point scoring category to capture these state efforts.

Hawaii consumes almost no natural gas (EIA 2019c), so it aims energy efficiency efforts at electricity only. To avoid penalizing the state for this, we awarded Hawaii points for natural gas efficiency spending, savings, and regulatory structures equivalent to the proportion of points it earned for corresponding electricity programs and policies.

We continue our practice of reporting programs' incremental energy savings (savings from measures installed in a given year) rather than their total annual energy savings (those achieved in a year from measures installed that year and in prior years) or cumulative savings. We report incremental savings in the *State Scorecard* for two reasons. First, basing our scoring on total annual savings or cumulative energy savings would involve levels of complexity that are beyond the scope of the *State Scorecard*, including identifying the start year for the cumulative series and accurately accounting for the life of energy efficiency measures and the persistence of savings. Second, the *State Scorecard* aims to provide a snapshot of states' current energy efficiency programs, and incremental savings give a clearer picture of recent efforts.

There are some other possible metrics we did not use for 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 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.

Note that scores are for states as a whole and therefore may not be representative of the specific efforts of each utility within a state. A single utility or a small set of utilities may do very well in terms of energy efficiency programs and associated metrics (spending and savings), but when all utilities in a state are viewed cumulatively, such efforts can be masked in the *State Scorecard* by other utilities with lower performance. For more information on the energy savings performance of individual utilities, refer to *The 2020 Utility Energy Efficiency Scorecard* (Relf, Cooper, and Gold 2020), published by ACEEE.

Table 6 lists states' overall utility scores. Explanations of each metric follow.

Table 6. Summary of state scores for utility and public benefits programs and policies

State	2019 electricity program savings (7 pts.)	2019 natural gas and fuels program savings (3 pts.)	2019 electricity EE spending (2.5 pts.)	2019 gas program spending (1.5 pts.)	2020 opt-out provision (–1 pt.)	2020–2025 energy efficiency resource standard (3 pts.)	2020 performance incentives and fixed-cost recovery (2 pts.)	2019 low-income energy efficiency programs (1 pt.)	2020 total score (20 pts.)
Massachusetts	7	2.5	2.5	1.5	0	3	2	1	19.5
Rhode Island	7	2.5	2.5	1.5	0	3	2	1	19.5
Vermont	7	1	2.5	1.5	0	2.5	2	1	17.5
California	6	3	1.5	1	0	1.5	2	1	16
Maryland	7	0.5	1.5	0.5	0	2	1	1	13.5
New York	4	1.5	1.5	1	0	2.5	2	1	13.5
Michigan	4.5	2.5	1	1	0	1.5	1.5	1	13
Minnesota	3.5	2.5	1	1	0	2	2	1	13
Connecticut	4	1	1.5	1.5	0	1.5	2	1	12.5
Illinois	5	1.5	1.5	0.5	–1	2.5	1	1	12
Hawaii	4	2	0.5	0.5	0	1	2	1	11
Oregon	3.5	1.5	1.5	1	0	1.5	1	1	11
New Hampshire	3	0.5	1	1.5	0	1.5	1.5	1	10
Colorado	3	1	1	0.5	0	2	1.5	0.5	9.5
District of Columbia	4	2	0.5	0.5	0	0	1.5	1	9.5
Maine	3.5	0.5	1	1	0	1.5	0.5	1	9
Arizona	3	1	0.5	0	0	2.5	1	0.5	8.5
New Jersey	2	0.5	0.5	1	0	2	1.5	1	8.5
Washington	3	0.5	1	0.5	0	1	1	0.5	7.5
Wisconsin	2	1.5	0.5	0.5	0	1	1	1	7.5

State	2019 electricity program savings (7 pts.)	2019 natural gas and fuels program savings (3 pts.)	2019 electricity EE spending (2.5 pts.)	2019 gas program spending (1.5 pts.)	2020 opt-out provision (–1 pt.)	2020–2025 energy efficiency resource standard (3 pts.)	2020 performance incentives and fixed-cost recovery (2 pts.)	2019 low-income energy efficiency programs (1 pt.)	2020 total score (20 pts.)
Arkansas	2	1.5	0.5	0.5	–1	1.5	1.5	0.5	7
New Mexico	1.5	0.5	0.5	0.5	0	1	1.5	1	6.5
Utah	2	2	0.5	0.5	0	0	1	0.5	6.5
Idaho	3	0	1.5	0.5	0	0	0.5	0.5	6
Nevada	2	0	0.5	0	0	1	0.5	1	5
Indiana	2	0.5	0.5	0.5	–1	0	1	0.5	4
Iowa	2	0.5	0.5	0.5	–1	1	0	0.5	4
Ohio	3	0	0.5	0	–1	0	1	0.5	4
Oklahoma	1	0.5	0.5	0.5	–1	0	1.5	1	4
Pennsylvania	2	0	0.5	0	0	0.5	0	1	4
Delaware	0.5	0.5	0.5	1	0	0	0	1	3.5
Montana	1.5	0	0.5	0.5	0	0	0	1	3.5
North Carolina	2	0	0.5	0	–1	0	1	0.5	3
Missouri	2	0	0.5	0	–1	0	0.5	0.5	2.5
Georgia	0.5	0	0	0	0	0	1	0.5	2
Mississippi	0	0.5	0	0.5	0	0	0.5	0.5	2
South Carolina	1.5	0	0.5	0	–1	0	0.5	0.5	2
South Dakota	0.5	0	0	0	0	0	1.5	0	2
Florida	0	0	0	1	0	0	0	0.5	1.5
Kentucky	0.5	0	0	0	–1	0	1.5	0.5	1.5
Virginia	0	0	0	0	–1	1	0.5	1	1.5
Alaska	0	0	0	0	0	0	0	1	1
Tennessee	0	0	0	0	0	0	0.5	0.5	1
Texas	0.5	0	0	0	–1	0	0.5	1	1
Wyoming	0.5	0	0	0	0	0	0.5	0	1
Kansas	0	0	0	0	0	0	0	0.5	0.5
Louisiana	0	0	0	0	0	0	0.5	0	0.5
Nebraska	0.5	0	0	0	0	0	0	0	0.5
Alabama	0	0	0	0	0	0	0	0	0
North Dakota	0	0	0	0	0	0	0	0	0
West Virginia	0	0	0	0	–1	0	0	0	–1

DISCUSSION

History of Utility and Public Benefits Programs and Policies

The structure and delivery of customer-funded electric energy efficiency programs have changed dramatically over the past three decades, mostly in conjunction with electric industry restructuring efforts.[22] In the 1980s and 1990s, such programs were almost exclusively the domain of utilities, but efforts in the mid-1990s to restructure and deregulate the electric utilities led numerous states to implement public benefits charges as a new source of funding for efficiency. These public benefits approaches established new structures under which utilities—or, in some states, separate efficiency utilities or other third parties—were tasked with administering and delivering energy efficiency, renewable energy, and low-income programs.[23]

Despite such public benefits programs, restructuring still resulted in a precipitous decline in funding for energy efficiency programs in the late 1990s, primarily due to regulatory uncertainty and the expected loss of cost-recovery mechanisms for those programs.[24] Generally, utilities did not see customer-funded energy efficiency programs as being compatible with competitive retail markets.

After restructuring efforts slowed in some states, utility commissions renewed their focus on energy efficiency programs. From their low point in 1998, annual investments in electricity programs had 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 2019 total spending for electric efficiency increased about 2.9% to $6.84 billion. Adding natural gas program spending of $1.53 billion, we estimate total efficiency program spending of approximately $8.37 billion in 2019 (see figure 2), an increase of about 3.8% compared with 2018.

[22] By *customer-funded energy efficiency programs*—also known as *ratepayer-funded energy efficiency programs*—we mean energy efficiency programs funded through charges wrapped into customer rates or appearing as some type of fee on customer utility bills. This includes both utility-administered programs and public benefits programs administered by other entities. We do not include data on separately funded low-income programs, load management programs, or energy efficiency R&D.

[23] States that have established nonutility administration of efficiency programs include Delaware, District of Columbia, Hawaii, Maine, New Jersey, New York, Oregon, Vermont, and Wisconsin.

[24] Under traditional regulatory structures, utilities do not have an economic incentive to help their customers become more energy efficient because their revenues and profits decline in line with falling energy sales resulting from energy efficiency programs. To address this disincentive, state regulators allow utilities to recover, at a minimum, the costs of running energy efficiency programs through charges on customer bills. For more on this issue, see York and Kushler (2011).

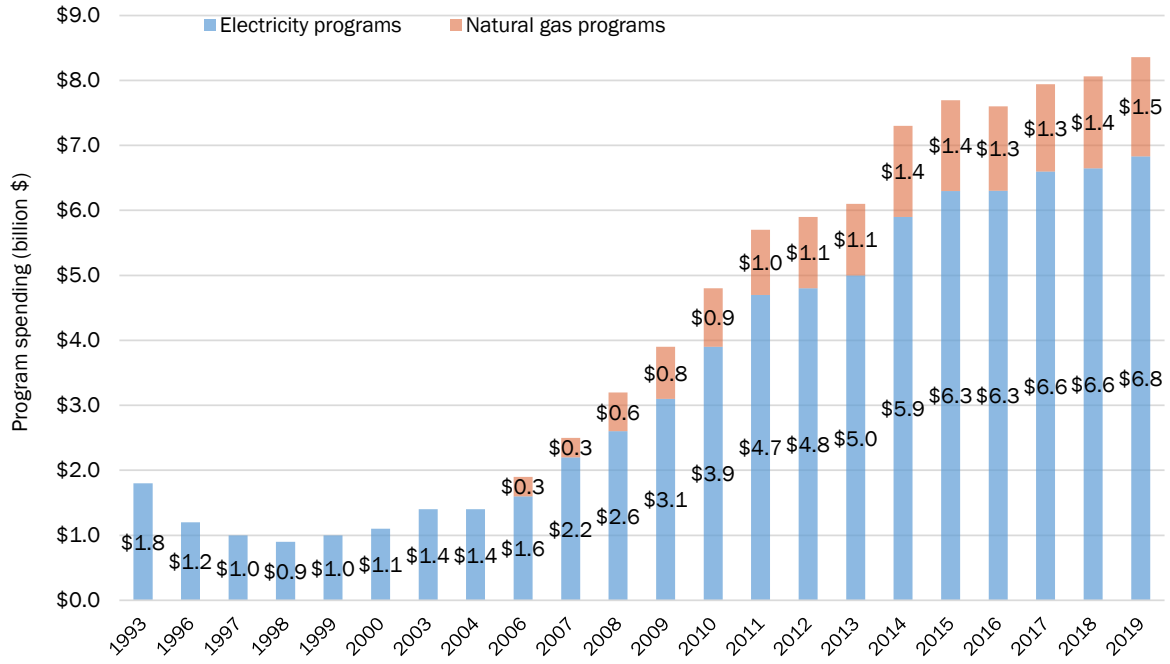

Figure 2. Annual electric and natural gas energy efficiency program spending. Natural gas spending is not available for the years 1993–2004. *Sources:* Nadel, Kubo, and Geller 2000; York and Kushler 2002, 2005; Eldridge et al. 2007, 2008, 2009; CEE 2012, 2013, 2014, 2015, 2016, 2017, 2018; Gilleo et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

Nationwide reported savings from utility and public benefits electricity programs in 2019 totaled 0.70% of sales, or 26.9 million MWh, a 0.75% decrease from 2018. 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 almost 273 million MWh in 2019: the 26.9 million MWh of incremental savings plus savings still accruing from measures implemented in prior years.[25] These large-scale savings are equivalent to approximately 7.07% of 2019 electricity consumption.

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

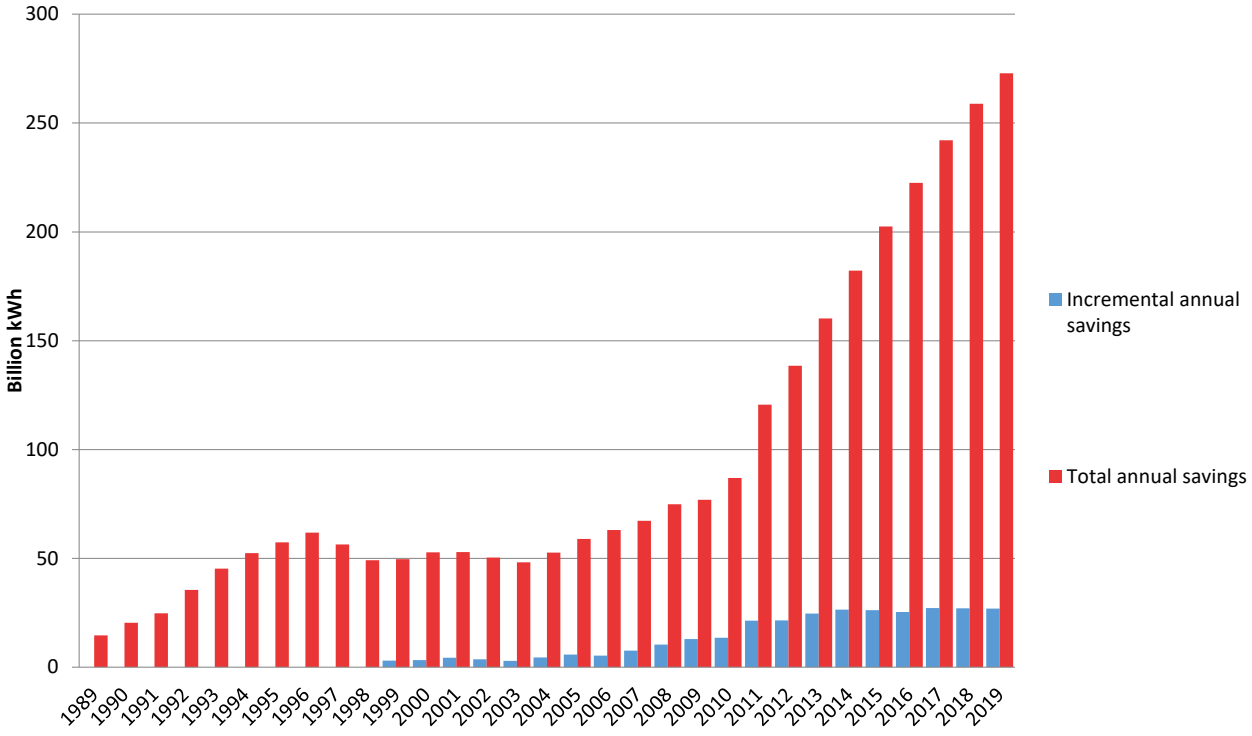

Figure 3. Electric savings from utility-sector energy efficiency programs, by year

Regional Highlights from State Utility Policies and Programs

Though COVID-19 hampered efforts in many states to enact clean energy rules and legislation, there remained numerous examples of important utility reforms advanced or achieved by lawmakers and regulators amid the pandemic.

NORTHEAST

Home to many of the *Scorecard*'s leading states, the Northeast continued to see progress in advancing efficiency in the utility sector. In New Jersey, following months of work by stakeholders, the utilities commission, and staff, the Board of Public Utilities produced an order in June setting ambitious goals to ramp up annual savings to 2.15% of electric use and 1.1% of gas use; these exceed even the respective 2% and 0.75% electric and gas goals initially called for in the state's 2018 Clean Energy Act. The order also transitions the utilities to a more central role in program delivery, establishes a performance-based recovery mechanism to encourage utilities to maximize customer savings, and strengthens stakeholder engagement processes with an added focus on equity and workforce development, all signaling a new era for efficiency in New Jersey.

In January the New York Public Service Commission also issued a major new efficiency order. It calls for the achievement of 185 TBtus of savings by 2025 per the state's Climate Leadership and Community Protection Act (CLCPA), translating to nation-leading annual goals of 3% electric savings and 1.3% natural gas savings. The order also includes a 3.6 TBtu carve-out target for savings from heat pumps, alongside a $454 million combined budget with $30

million set aside for low-to-moderate-income heat pump adoption. Shortly afterward, Con Edison announced a $1.5 billion initiative tripling efficiency investments in 2025 with a focus on heat pump deployment.

There is a growing movement among a number of states to better integrate fuel switching and electrification within efficiency portfolios, and Massachusetts continued to pursue policy designs at the leading edge of this trend. In the Bay State these efforts have been spurred in part by 2018 legislation redefining energy efficiency to include strategic electrification, aligning with the state's decarbonization goals. The current 2019–2021 efficiency plan now reflects a more holistic approach to measuring overall energy use, including an all-fuel efficiency savings metric in MMBtu with a focus on fuel switching. In March 2020, a study was completed to refine the methodology for calculating all-fuel energy savings; this will likely be further reviewed as part of the 2022–2024 planning process (Molina et al. 2020). Later in the year, the state also instituted a first-of-its-kind Clean Peak Energy Standard that provides incentives to promote the use of clean energy during periods of peak electricity demand.

MIDWEST

As across much of the United States, legislative sessions in the Midwest convened on a limited basis during 2020. While lawmakers in Illinois and Minnesota sought to advance significant clean energy bills early in the year, these efforts stalled amid competing legislative priorities, though efforts are ongoing for revival in future sessions. These included proposed bills in Minnesota that would transition the state to carbon-free electricity by 2050, raise efficiency targets, and expand efficiency portfolios to allow the inclusion of beneficial electrification and load management measures. Similarly, in Illinois, the proposed Clean Energy Jobs Act would greatly expand efficiency programs and standards across the state and set a strengthened goal of 100% renewable energy by 2050. Though the bill was not called to a vote in earlier legislative sessions, in August the governor announced plans to restart working group discussions with an eye toward potentially adopting the legislation later in the year.

Promising efforts were also underway in Michigan, where the governor and Public Service Commission launched MI Power Grid in October 2019. The multiyear stakeholder initiative will undertake work on new technologies, pilots, and utility businesses models in order to optimize the transition to a clean energy grid (State of Michigan 2019). In addition, state energy reforms passed in 2016 continue to push Michigan's regulated utilities to strengthen long-term planning, with an emphasis on clean energy and efficiency. Both major utilities, Consumers Energy and DTE, recently adopted integrated resource plans scaling up efficiency savings to 2% of annual electricity sales by 2021, far exceeding the 1% minimum statutory savings goals.

SOUTHEAST

A major victory for efficiency in the Southeast came out of Virginia this year, where lawmakers passed the Virginia Clean Economy Act. In addition to putting the state on a path to 100% clean electricity, the bill establishes the state's first-ever energy efficiency resource standard, making it one of only two states in the region, alongside Arkansas, with a mandatory EERS. Virginia's EERS stipulates that by 2025, Dominion must achieve at least 5% energy efficiency savings and that Appalachian Power Company must reach 2% savings. This

translates to an average statewide incremental annual goal of 1.2% savings each year. The bill also sets up a process to strengthen the EERS after 2025, with the State Corporation Commission adjusting savings targets every three years thereafter. Importantly, utilities will have to prove they are achieving those targets before they are permitted to build new fossil fuel plants.

While state commitments to ramp up clean energy have been less of a priority across the rest of the Southeast region, some utilities, such as Dominion Energy, Duke Energy, and Southern Company, have stepped up recently to announce net-zero carbon emissions goals to be achieved by midcentury. These pledges, while a positive sign, will need to be matched by tangible long-term resource planning decisions that phase out fossil fuels and shift toward renewable sources in the very near future. In September Duke filed its integrated resource plan (IRP) for the next 15 years in the Carolinas. It shows a promising increased emphasis on efficiency as part of its pathway to net zero, although much uncertainty remains (Duke Energy 2020).

WEST

In a year of record-breaking wildfires, California's 100% zero-carbon electricity goals took on added urgency as regulators looked for ways to accelerate action. In late 2019, months after the state PUC's issuance of updated 10-year utility savings targets, the California Energy Commission released its *2019 California Energy Efficiency Action Plan*, charting progress toward statewide SB 350 goals to double efficiency by 2030 (Kenney, Bird, and Rosales 2019). While the CEC currently anticipates a shortfall in meeting ambitious 2030 targets due to a variety of factors, it also makes supplemental recommendations for increasing program participation and stimulating new market activity. These recommendations include expanding funding beyond ratepayer portfolios, strengthening collection and sharing of energy data, and better understanding and incorporating demand flexibility into building and appliance standards, to name just a few.

In Colorado, following a wave of important clean energy legislation signed in 2019—including a 90% economy-wide GHG reduction goal—the state PUC got to work on related legislated calls to reform utility distribution system planning and business models. These efforts have included an investigation into a performance-based regulation (PBR) model to potentially include performance metrics and corresponding financial incentives aligned with public benefits goals like safety, cost efficiency, and emissions reductions (Colorado Energy Office 2019). The PUC plans to submit a report on its findings and recommendations to the legislature in November 2020.

Other states pursuing new PBR frameworks to better align utility investments with state energy goals include Hawaii and Nevada. The Hawaii PUC concluded Phase 1 of its PBR proceeding in 2019 by issuing an order establishing a new utility regulatory framework; Phase 2, focusing on development of revenue adjustment mechanisms and performance incentives, is expected to produce a PUC order by the end of 2020 (Hawaii PUC 2019). Similarly, Nevada took important steps to implement SB 300, signed in 2019, which requires the utilities commission to adopt regulations enabling utilities to seek approval of alternative ratemaking plans intended to promote renewable energy, energy efficiency, and other flexible grid resources. During the summer the commission issued a series of concept papers building

toward a framework for development of goals and outcomes and outlining future work to be undertaken by stakeholders (State of Nevada Public Utilities Commission 2020).

In Arizona, the state Corporation Commission (ACC) laid the groundwork this year for a new clean energy future with a 4–1 vote approving a 100% carbon-free electricity standard. It was also a pivotal year for energy efficiency, with the ACC approving a new demand-side management (DSM) plan for the Arizona Public Service Company (APS) that restores funding for a number of energy efficiency programs. In addition, the new carbon-free standard approved in November includes an important extension and expansion of the state's existing EERS—which was scheduled to expire this year—ushering in a new era of utility energy savings programs. The vote kicks off a rulemaking and hearing process and will require a final vote by the new commission next year. The coming months will be critical as the utilities and regulators determine which direction to take in the next iteration of efficiency programs.

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. Utilities estimate program energy savings, which are then subject to internal or third-party evaluation, measurement, and verification (EM&V) and are typically reported to the public utility commission on a semiannual or annual basis.

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). 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 consider electric and natural gas savings separately for the purposes of this report, our research has found that a handful of states—particularly those with aggressive clean energy and GHG reduction goals—have begun considering savings on a combined fuel-neutral basis. 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 in regions with a relatively high penetration of renewable energy resources. This approach to accounting is still in its infancy, but as more states prioritize beneficial electrification as a decarbonization

strategy, we expect to see this practice become more commonplace and will adjust our *Scorecard* methodology as appropriate.[26]

SCORES FOR INCREMENTAL SAVINGS IN 2019 FROM ELECTRIC EFFICIENCY PROGRAMS

We report 2019 statewide net energy efficiency savings as a percentage of 2018 retail electricity sales, scoring the states on a scale of 0 to 7. We relied primarily on states to provide these data. Thirty-five states and the District of Columbia completed some or all of our data request form. Where no data for 2019 were available, we used the most recent savings data obtainable, either state-reported 2018 savings from the *2019 State Scorecard* or information from the EIA (2020b).

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 7 lists the scoring for each level of savings.

Table 7. Scoring of utility and public benefits electricity savings

2019 savings as % of sales	Score
2% or greater	7
1.86–1.99%	6.5
1.72–1.85%	6
1.58–1.71%	5.5
1.44–1.57%	5
1.30–1.43%	4.5
1.16–1.29%	4
1.02–1.15%	3.5
0.88–1.01%	3
0.74–0.87%	2.5
0.60–0.73%	2
0.46–0.59%	1.5
0.32–0.45%	1
0.18–0.31%	0.5
Less than 0.18%	0

Table 8 shows state results and scores. Nationwide reported savings from utility and public benefits electricity programs in 2019 totaled 26.92 million MWh, equivalent to 0.70% of sales.

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

This is approximately 0.8% less than the 27.13 million MWh (0.73% of sales) reported last year.

Table 8. 2019 net incremental electricity savings by state

State	2019 net incremental savings (MWh)	% of 2018 retail sales	Score (7 pts.)
Rhode Island	190,159	2.51%	7
Massachusetts	1,199,409	2.25%	7
Maryland	1,327,930	2.14%	7
Vermont	117,289	2.12%	7
California†	4,447,063	1.74%	6
Illinois	2,061,135	1.44%	5
Michigan	1,474,105	1.41%	4.5
New York	1,939,971	1.29%	4
District of Columbia	139,560	1.23%	4
Connecticut	349,772	1.21%	4
Hawaii†	110,774	1.19%	4
Minnesota†	729,734	1.06%	3.5
Oregon†	523,590	1.06%	3.5
Maine†	127,786	1.03%	3.5
Washington†*	880,976	0.98%	3
Arizona†*	763,855	0.97%	3
Colorado†‡	535,056	0.95%	3
Ohio†*	1,447,594	0.95%	3
New Hampshire†*	103,111	0.93%	3
Idaho†	210,216	0.88%	3
Nevada†	277,469	0.73%	2
Pennsylvania	1,068,377	0.72%	2
Iowa†‡	360,095	0.70%	2
Utah	201,850	0.65%	2
North Carolina	890,940	0.64%	2
Wisconsin	455,118	0.64%	2
Missouri†*	515,242	0.63%	2
Arkansas	311,006	0.63%	2
Indiana†*	650,482	0.62%	2
New Jersey†	469,560	0.62%	2
New Mexico	134,209	0.56%	1.5
Montana†	82,161	0.55%	1.5
South Carolina†*	426,283	0.52%	1.5
Oklahoma*	288,417	0.45%	1
Nebraska†‡	74,428	0.24%	0.5
South Dakota†	30,359	0.24%	0.5
Georgia†	322,918	0.23%	0.5
Wyoming†	38,484	0.23%	0.5
Texas†	826,884	0.19%	0.5
Delaware	22,447	0.19%	0.5
Kentucky†*	135,912	0.18%	0.5
Mississippi	79,460	0.16%	0
West Virginia	52,221	0.16%	0
Louisiana†‡	118,281	0.13%	0
Virginia†*	133,322	0.11%	0
Florida†	251,346	0.11%	0
Tennessee	16,727	0.02%	0
North Dakota†	3,002	0.01%	0
Alabama†*	8,647	0.01%	0
Alaska†*	247	0.00%	0
Kansas†*	265	0.00%	0
U.S. total	**26,925,246**	**0.70%**	
Median	**277,469**	**0.64%**	

Savings data are from public service commission staff as listed in Appendix A, unless noted otherwise. Sales data are from EIA Form 861 (2020b).
* For states where we were unable to obtain savings data from commission staff, we relied on 2019 adjusted gross savings data from EIA-861 (2020). † At least a portion of savings were reported as gross. We adjusted the gross portion by a net-to-gross factor of 0.825 to make it comparable to net savings figures reported by other states. ‡ Includes both state-reported IOU data and some portion of EIA-reported savings for municipal utilities and co-ops.

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. This is particularly true of a state's treatment of free ridership (savings attributed to a program that would have occurred even in the absence of the program) and spillover (savings *not* attributed to a program that would *not* have occurred without it). States report energy savings as either net or gross, with net savings accounting for free riders and free drivers, and gross savings not accounting for these.[27] 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, Kushler 2020). This finding points to several important caveats regarding the electric program savings data. A number of states do not estimate or report net savings. In these cases, we applied a standard factor of 0.825 to convert gross savings to net savings (a net-to-gross ratio).[28] Doing so allows a more straightforward comparison with states that report net electricity savings. It also should be noted that different states and utilities may define net savings in different ways and adopt different calculation methods.

SCORES FOR INCREMENTAL SAVINGS IN 2019 FROM NATURAL GAS AND UNREGULATED FUELS EFFICIENCY PROGRAMS

Utilities are increasing the number and size of natural gas programs in their portfolios. However, data on savings resulting from these programs are still limited. In this category we awarded points to states that were able to track savings from their natural gas and unregulated fuels efficiency programs and realized savings of at least 0.17% of sales in the residential and commercial sectors. We relied on data from state utility commissions. Table 9 lists scoring criteria for natural gas and unregulated fuels program savings. We awarded a maximum of 3 points to states reporting savings of at least 1.00% of sales.

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.

[27] 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.

[28] We based the 0.825 net-to-gross factor used this year on the median net-to-gross ratio calculated from those jurisdictions that reported figures for both net and gross savings in this year's data request. These were Colorado, Connecticut, Delaware, District of Columbia, Illinois, Maryland, Missouri, Montana, Nevada, New York, North Carolina, Pennsylvania, Oklahoma, Oregon, Tennessee, Utah, West Virginia, and Wisconsin. We applied this conversion factor to all states reporting only gross savings. We determined savings to be gross on the basis of responses to our survey of public utility commissions.

To integrate unregulated fuels, we collected 2019 savings data on fuel oil, kerosene, propane, and wood from public service commissions and added these to the natural gas savings reported for each state. Similarly, we obtained consumption data by state for each fuel type from the EIA and combined this with natural gas energy sales for residential and commercial customers. We converted all energy units to MMBtus and divided savings by sales to create the common metric.

Table 9. Scoring of natural gas and unregulated fuel program savings

Savings as % of sales	Score
1.00% or greater	3
0.84–0.99%	2.5
0.67–0.83%	2.0
0.50–0.66%	1.5
0.34–0.49%	1
0.17–0.33%	0.5
Less than 0.17%	0

Table 10 shows states' scores for natural gas and unregulated fuel program savings.[29]

[29] 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 0.846 based on states that reported figures for both net and gross natural gas savings in this year's data request. These were Connecticut, Delaware, District of Columbia, Maryland, Massachusetts, Montana, Oklahoma, Oregon, Pennsylvania, and Wisconsin.

Table 10. State scores for 2019 natural gas and fuel efficiency program savings

State	2019 net incremental fuel savings (MMBtu)*	% of commercial and residential retail sales**	Score (3 pts.)
California	8,330,145	1.05%	3
Massachusetts†	3,364,493	0.91%	2.5
Rhode Island†	503,186	0.91%	2.5
Michigan	5,731,629	0.90%	2.5
Minnesota	2,832,660	0.84%	2.5
Utah	960,000	0.76%	2
District of Columbia	239,000	0.72%	2
Hawaii**	—	—	2
Illinois	4,330,000	0.58%	1.5
Wisconsin	1,829,486	0.55%	1.5
New York†	5,725,989	0.53%	1.5
Oregon	590,418	0.51%	1.5
Arkansas	560,000	0.50%	1.5
Arizona*	344,501	0.40%	1
Colorado	849,314	0.38%	1
Connecticut†	701,650	0.35%	1
Vermont†	195,036	0.34%	1
Maryland	686,791	0.33%	0.5
New Hampshire†*	255,487	0.30%	0.5
Maine†	297,040	0.30%	0.5
Iowa	477,761	0.28%	0.5
Oklahoma	370,000	0.27%	0.5
Delaware	98,788	0.27%	0.5
Indiana*	718,893	0.26%	0.5
Washington*	507,600	0.25%	0.5
New Jersey	1,137,484	0.24%	0.5
Mississippi	110,868	0.19%	0.5
New Mexico	150,000	0.18%	0.5
North Carolina	160,000	0.08%	0
Idaho	44,900	0.06%	0
South Dakota	22,830	0.06%	0
Florida	64,947	0.06%	0
Montana	43,708	0.06%	0
Pennsylvania	226,060	0.04%	0
Alabama	—	0.00%	0
Alaska	—	0.00%	0
Georgia	—	0.00%	0
Kansas	—	0.00%	0
Kentucky	—	0.00%	0
Louisiana	—	0.00%	0
Missouri	—	0.00%	0
Nebraska	—	0.00%	0
Nevada	—	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	**42,460,661**	**0.38%**	
Median	**160,000**	**0.19%**	

Savings data were reported by contacts at public utility commissions as listed in Appendix A, unless otherwise noted. All sales data are from EIA Form 176 (EIA 2020d) and EIA's State Energy Data System (SEDS) (EIA 2019e). * States for which we did not have 2019 savings data were scored on 2018 state-reported savings. ** Hawaii uses very limited natural gas and therefore earned points commensurate with its electric efficiency savings scores. † At least a portion of natural gas savings were reported as gross; we adjusted the gross portion by a net-to-gross factor of 0.846 to make it comparable to net savings figures reported by other states. ‡ These states reported some level of unregulated fuel savings.

Electricity and Natural Gas Efficiency Program Funding

In this category, we scored states on 2019 electricity and natural gas efficiency program spending for customer-funded energy efficiency programs. These programs are funded through charges included on utility customers' bills.[30] 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.[31] Where RGGI funds were channeled to energy efficiency initiatives implemented by state governments, we included them in Chapter 6, "State Government–Led Initiatives."

For states that did not provide data for 2019 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 2018 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 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. Tables 12 and 14 below report electricity and natural gas efficiency program spending, respectively.

SCORES FOR ELECTRIC PROGRAM SPENDING

States could receive up to 2.5 points for their energy efficiency spending as a percentage of 2018 electric utility revenues, with the threshold for the maximum achievable points set at 5.0% of revenues.[32] For every 1.05 percentage points less than 5%, a state's score decreased by 0.5 points. Table 11 lists the scoring bins for each spending level.

[30] 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.

[31] 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.

[32] Statewide revenues are from EIA Form 861 (EIA 2020b). We measure spending as a percentage of revenues to normalize the level of energy efficiency spending. Blending utility revenues from all customer classes gives a more accurate measure of utilities' overall spending on energy efficiency than does expressing budgets per capita, which might skew the data for utilities that have a few very large customers. Statewide electric energy efficiency spending per capita is presented in Appendix B.

Table 11. Scoring of electric efficiency program spending

2019 spending as % of revenues	Score
5.00% or greater	2.5
3.95–4.99%	2
2.90–3.94%	1.5
1.85–2.89%	1
0.80–1.84%	0.5
Less than 0.80%	0

Table 12 shows state-by-state results and scores for this category.

Table 12. 2019 electric efficiency program spending by state

State	2019 elec. spending ($ million)	% of statewide elec. revenues	Score (2.5 pts.)
Rhode Island	104.1	7.58%	2.5
Vermont	55.2	6.59%	2.5
Massachusetts	620.4	6.29%	2.5
Maryland	275.6	3.84%	1.5
Oregon	161.5	3.70%	1.5
California	1516.4	3.58%	1.5
Illinois	433.8	3.17%	1.5
Idaho	61.4	3.16%	1.5
Connecticut	161.4	3.04%	1.5
New York	645.2	2.90%	1.5
Maine	45.9	2.76%	1
Washington*	190.7	2.65%	1
New Hampshire*	48.6	2.59%	1
Minnesota	157.0	2.20%	1
Michigan	250.7	2.10%	1
Colorado	108.0	1.91%	1
Utah	47.1	1.84%	0.5
Arkansas	68.0	1.76%	0.5
Iowa*	75.6	1.65%	0.5
Hawaii	42.0	1.54%	0.5
Delaware	17.9	1.44%	0.5
New Mexico	31.7	1.41%	0.5
Nevada	45.3	1.38%	0.5
Oklahoma	68.6	1.31%	0.5
Pennsylvania	197.5	1.31%	0.5
New Jersey	123.0	1.22%	0.5
Ohio*	175.0	1.15%	0.5
North Carolina	145.8	1.14%	0.5
District of Columbia	15.4	1.13%	0.5
Montana	14.4	1.09%	0.5
Indiana*	107.3	1.06%	0.5
Missouri	85.8	1.05%	0.5
Wisconsin	79.0	1.05%	0.5
Arizona*	86.2	1.01%	0.5
South Carolina*	64.0	0.81%	0.5
Wyoming	10.2	0.75%	0
Texas	196.2	0.55%	0
Florida	105.4	0.43%	0
Georgia	57.0	0.42%	0
Kentucky*	27.2	0.42%	0
Mississippi	17.1	0.37%	0
South Dakota	4.7	0.37%	0
Louisiana	24.6	0.34%	0
Virginia*	31.7	0.28%	0
West Virginia	7.6	0.26%	0
Nebraska	7.1	0.25%	0
Tennessee	19.2	0.19%	0
Alabama*	7.7	0.09%	0
North Dakota*	0.2	0.01%	0
Kansas*	0.3	0.01%	0
Alaska*	0.0	0.00%	0
U.S. total	**6,841.6**	**1.68%**	
Median	**64.0**	**1.22%**	

2018 statewide revenues are from EIA Form 861 (EIA 2020b). Spending data are from public service commission staff as listed in Appendix A.
* Where 2019 spending was not available from states, we substituted 2019 spending as reported by EIA-861 (EIA 2020d).

SCORES FOR NATURAL GAS PROGRAM SPENDING

We scored states on natural gas efficiency program spending by awarding up to 1.5 points based on 2019 program spending data gathered from a survey of state utility commissions and independent statewide administrators. To directly compare spending data among the states, we normalized spending by the number of residential natural gas customers in each state in 2018, as reported by EIA (2020e).[33] Table 13 shows scoring bins for natural gas program spending. As in last year's *State Scorecard*, states posting spending of at least $50 per customer were awarded the maximum number of points.

Table 13. Scoring of natural gas utility and public benefits spending

2019 gas spending per customer	Score
$50 or greater	1.5
$27.50–49.99	1
$5.00–27.49	0.5
Less than $5.00	0

After a significant uptick in 2014, natural gas program spending levels have remained relatively flat in recent years. In 2019, spending totaled $1.5 billion, comparable to 2018 levels. Natural gas efficiency spending remains significantly lower than spending for electricity energy efficiency programs. Table 14 shows states' scores.

[33] We used spending per residential customer for natural gas because reliable natural gas revenue data are sparse, and use of per capita data unfairly penalizes states that offer natural gas service to only a portion of their population (such as Vermont). State data on the number of residential customers are from EIA (2020e).

Table 14. 2019 natural gas efficiency program spending by state

State	2019 gas spending ($ million)	$ per 2018 residential customer	Score (1.5 pts.)
Massachusetts	279.5	$182.35	1.5
Rhode Island	30.1	$123.59	1.5
Connecticut	44.9	$80.58	1.5
New Hampshire*	7.9	$73.20	1.5
Vermont	3.1	$66.85	1.5
Minnesota	65.7	$42.56	1
New York	177.4	$39.22	1
Oregon	28.7	$38.14	1
Maine	1.3	$37.28	1
Florida	26.7	$35.14	1
California	385.5	$34.96	1
Delaware	6.0	$33.87	1
New Jersey	89.5	$31.77	1
Michigan	96.0	$29.12	1
Arkansas	14.7	$26.51	0.5
Utah	23.6	$24.83	0.5
District of Columbia	3.8	$24.72	0.5
Washington*	27.3	$22.86	0.5
Iowa	20.1	$21.59	0.5
Illinois	75.9	$19.34	0.5
Oklahoma	16.6	$17.54	0.5
Wisconsin	20.0	$11.27	0.5
Colorado	20.0	$11.23	0.5
Idaho	4.3	$10.65	0.5
New Mexico	6.0	$10.12	0.5
Montana	2.4	$8.62	0.5
Indiana*	13.6	$7.77	0.5
Maryland	7.7	$6.67	0.5
Mississippi	2.3	$5.06	0.5
Arizona*	5.5	$4.35	0
Pennsylvania	11.4	$4.06	0
South Dakota	0.8	$4.04	0
Missouri	5.6	$3.97	0
North Carolina	2.0	$1.56	0
Nevada	1.2	$1.38	0
Alabama	0.0	$0.00	0
Alaska	0.0	$0.00	0
Georgia	0.0	$0.00	0
Hawaii**	0.0	$0.00	0.5
Kansas	0.0	$0.00	0
Kentucky	0.0	$0.00	0
Louisiana	0.0	$0.00	0
Nebraska	0.0	$0.00	0
North Dakota	0.0	$0.00	0
Ohio	0.0	$0.00	0
South Carolina	0.0	$0.00	0
Tennessee	0.0	$0.00	0
Texas	0.0	$0.00	0
Virginia	0.0	$0.00	0
West Virginia	0.0	$0.00	0
Wyoming	0.0	$0.00	0
U.S. total	**1,526.8**		
Median	**5.5**		

Spending data are from public service commission staff as listed in Appendix A, unless noted otherwise. * Where 2019 spending data were not available, we substituted 2018 spending as reported by public service commission staff. ** Hawaii was awarded points commensurate with points received for electricity spending.

Opt-Out Provisions for Large Customers

As we have since the *2014 State Scorecard*, we provide an assessment of opt-out and self-direct provisions for large customers. In many cases large customers seek to opt out of utility energy efficiency programs, asserting that they have already captured all the energy efficiency that is cost effective. However, this is seldom the case (Chittum 2011). Opt-out differs from self-direct in that customers who opt out do not have to pay into energy efficiency funds at all; self-direct allows some customers to spend their efficiency fees internally, within their own business operations. Some state policies go beyond opt-out to fully exempt customers from participating in utility energy efficiency programs. In these cases, the customers are excluded and may not opt in.

Opt-out and exemption policies have several negative consequences. 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 have opted 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. While the ideal solution is for utilities to offer programs that respond to the needs of these large consumers, ACEEE's research suggests that this does not always happen (Chittum 2011). When it does not, we suggest giving these customers the option of self-directing their energy efficiency program dollars.[34] This option provides a path for including large-customer energy efficiency in the state's portfolio of savings. We provide examples of self-direct programs in Appendix C.

SCORES FOR LARGE-CUSTOMER OPT-OUT PROVISIONS

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.[35]

We did not subtract points for self-direct programs. When implemented properly, these programs can effectively meet the needs of large customers. Self-direct programs vary from state to state, with some requiring more stringent measurement and verification of energy savings than others (Chittum 2011). In the future, we may examine these programs with a more critical eye and subtract points from states that lack strong evaluation and measurement. Table 15 shows states with opt-out programs.

[34] Self-direct programs allow some customers, usually large industrial or commercial ones, to channel energy efficiency fees usually paid on utility bills directly into energy efficiency investments in their own facilities instead of into a broader, aggregated pool of funds. These programs should be designed to include comparable methods to verify and measure investments and energy savings. For more information, see aceee.org/sector/state-policy/toolkit/industrial-self-direct.

[35] By default, most large gas customers already are opted out because they take wholesale delivery (frequently directly from transmission) and are thus outside the purview of state government. We did not subtract points in these cases.

Table 15. 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 that 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 specifically exempts large customers under recent electric savings targets passed in SB 2814. These exemptions remove an estimated 10% of ComEd's and 25% of Ameren's load from programs. The exemption weakens participation even more than an opt-out policy in that these electric utility customers cannot participate in programs even if they wish to. Under 220 ILCS 5 8-104(m) there was also a self-direct/opt-out for certain large natural gas customers. However, this sunsets in 2020 per 220 ILCS 5 8-104(n).	–1
Indiana	Opt-out applies to the five 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.	–1
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 only 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 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.	–1
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

State	Opt-out description	Score
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., sub-transmission 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-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.	–1
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 (2020) replaces a previous automatic opt-out for industrial customers above 500 kW with a process enabling industrial 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."	–1
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, and thus these customers are 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.

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 2016 and 2017 (Gold et al. 2019). There are 27 states with EERS policies establishing specific energy savings targets that utilities and program administrators must meet through customer energy efficiency programs. This is one more than the 26 reported in the *2019 State Scorecard*, following the April 2020 signing of the Virginia Clean Economy Act, making the state the second in the Southeast—alongside Arkansas—with mandatory multiyear savings targets.

EERS policies set multiyear targets for electricity or natural gas savings, such as 1% or 2% incremental savings per year or 20% cumulative savings by 2025.[36] They differ from state to state, but 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

- 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.[37] ACEEE considers states with such requirements to have EERS policies in place once these policies have met all the 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

[36] *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.

[37] 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. New Hampshire's EERS sets forth a long-term goal of achieving all cost-effective efficiency, which is anticipated to be met through planning and goal-setting in future implementation cycles.

commitment to energy efficiency as a resource, building essential customer engagement as well as the workforce and market infrastructure necessary to sustain the high savings levels.[38]

States are increasingly seeking strategies to meet GHG reduction goals, for example through grid decarbonization and the electrification of buildings and vehicles. These efforts bring opportunities to adapt EERS policies to encourage resource-specific savings while also promoting technologies that may increase grid demand but result in net reductions in emissions. Redesigning goals and establishing new targets can help meet multiple policy objectives in these cases. Examples include establishing peak demand targets and fuel-neutral goals. These remove prohibitions on fuel switching to provide more flexibility and enable energy efficiency from beneficial electrification.

SCORES FOR ENERGY EFFICIENCY RESOURCE STANDARDS

A state could earn up to 3 points for its EERS policy. As table 16 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.

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 17). Most of the states with these policies in place 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 take the cost cap into account, rather than on the higher legislative targets.

In an effort to distinguish states pushing the boundaries of innovation in energy efficiency with ambitious goals, in 2017 we raised the threshold for the highest number of points to energy savings targets of 2.5% of sales or greater. Multiple states have proved that long-term savings of more than 2% are feasible and cost effective.

Table 16. Scoring of energy savings targets

Electricity savings target	Score
2.5% or greater	2.5
2–2.49%	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
EERS includes natural gas	+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

[38] 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 et al. 2019).

Utilities called for electric savings targets of 1.1% beginning in 2022 and ramping up to 1.45%, 1.8%, and 2.15% in each subsequent year, translating to an average incremental savings target of 1.6% over that time span.

States with pending targets had to be on a clear path toward 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 among major stakeholders on targets.

Leadership, sustainable funding sources, and institutional support are required for states to achieve their long-term energy savings targets. Several states currently have (or in the past have had) EERS-like structures in place but have lacked one or more of these enabling elements and thus have undercut the achievement of their savings goals. Florida, for example, sets relatively low voluntary goals and does not earn points in this category.[39] 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).

At the same time, some states, such as Maine, have fallen short of EERS targets. 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. We may change our scoring methodology in the future to reduce points allocated if a state does not hit savings targets.

EERS policies can vary widely with regard to the portion of statewide sales that they regulate. In several states, such as 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 currently account for this variation in EERS coverage, we may revise our methodology to do so in the future. Table 17 lists scores, and Appendix D includes full policy details.

Table 17. State scores for energy efficiency resource standards

State	% of sales covered within EERS policy	Approximate average annual electric savings target for 2020–2025	Cost cap	Natural gas	Score (3 pts.)
Massachusetts	85%	2.7%		•	3
Rhode Island	99%	2.5%		•	3
Vermont	98%	2.4%		•	2.5
Arizona†	56%	2.1%		•	2.5
New York†	100%	2.0%		•	2.5
Illinois	89%	2.0%	•	•	2.5
Colorado	56%	1.7%		•	2

[39] 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 sales covered within EERS policy	Approximate average annual electric savings target for 2020–2025	Cost cap	Natural gas	Score (3 pts.)
New Jersey	100%	1.6%		•	2
Maryland†	97%	1.6%			1.5
California†	73%	1.4%		•	1.5
New Hampshire	100%	1.3%		•	1.5
Arkansas	50%	1.2%		•	1.5
Minnesota†	97%	1.2%		•	1.5
Oregon†	61%	1.2%		•	1.5
Connecticut	93%	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
New Mexico	69%	1.0%			1
Iowa†	75%	0.9%	•	•	1
Washington†	83%	0.9%		•	1
Wisconsin	100%	0.7%	•	•	1
Pennsylvania	96%	0.6%	•		0.5
North Carolina	100%	0.4%			0
Texas†	74%	0.2%	•		0

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. See Appendix D for details and sources.

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

Under traditional regulatory structures, utilities do not have an economic incentive to promote energy efficiency. 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 amount of 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 and 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 other two 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 what is known as 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.[40] 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 other 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 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 19 shows, a number of states have enacted mechanisms that align utility incentives with energy efficiency.[41]

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 performance incentive mechanisms 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 18 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 2020b).

[40] 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. For this reason, the *Scorecard* does not recognize SFV in its scoring methodology in this section.

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

Table 18. Scoring of utility financial incentives

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 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.	0
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, 29 states offer a performance incentive for at least one major electric utility, and 17 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-two states have addressed disincentives for investment in energy efficiency for electric utilities. Of these, 15 have a lost revenue adjustment mechanism and 17 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 25 have a decoupling mechanism. Table 19 outlines these policies.

Table 19. Utility efforts to address lost revenues and financial incentives

	Decoupling or LRAM			Performance incentives			
State	Electric	Natural gas	Score (1 pt.)	Electric	Natural gas	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 York	Yes	Yes	1	Yes	Yes	1	2
Rhode Island	Yes	Yes	1	Yes	Yes	1	2

State	Decoupling or LRAM			Performance incentives			Total score (2 pts.)
	Electric	Natural gas	Score (1 pt.)	Electric	Natural gas	Score (1 pt.)	
Vermont	Yes	Yes	1	Yes	Yes	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	1	1.5
Kentucky	Yes†	Yes†	0.5	Yes	Yes	1	1.5
Michigan	No	Yes	0.5	Yes	Yes	1	1.5
New Hampshire	Yes†	Yes*	0.5	Yes	Yes	1	1.5
New Jersey	Yes[b]	Yes	1	Yes	No	0.5	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	Yes*	No	0.5	No	Yes	1	1
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
Louisiana	Yes†	No	0	Yes	No	0.5	0.5
Maine	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	No	No	0	No	No	0	0
Delaware	No	No	0	No	No	0	0
Florida	No	No	0	No	No	0	0

State	Decoupling or LRAM			Performance incentives			Total score (2 pts.)
	Electric	Natural gas	Score (1 pt.)	Electric	Natural gas	Score (1 pt.)	
Iowa	No	No	0	No	No	0	0
Kansas	Yes†	No	0	No	No	0	0
Montana	No	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 mechanism 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] New Jersey allows for LRAM or limited decoupling, through a Conservation Incentive Program (CIP), a weather-normalized, symmetrical decoupling mechanism that includes a variable margin test and a supply capacity cost reduction test (as approved for PSE&G).**

Utility Low-Income Energy Efficiency Programs

Low-income communities have historically experienced policies of systemic racial discrimination, which has led to disenfranchisement from income and wealth-building opportunities, especially for Black, Indigenous, and Hispanic communities. These policies also impact housing affordability, with research finding that low-income households tend to live in less efficient housing while devoting a greater proportion of their income to utility bills than do higher-income households (Bednar, Reames, and Keoleian 2017). ACEEE research finds that low-income, Black, Native American, and Hispanic people, as well as older adults, renters, and those residing in older buildings, spent a greater proportion of their income on energy bills (Drehobl, Ross, and Ayala 2020). Nationally, 67% of low-income households spend more than 6% of their income on their energy bills, compared with 25% of all households nationally (Drehobl, Ross, and Ayala 2020).

The legacy of historic and current systemic economic and social exclusion has led to a variety of factors that exacerbate home energy burdens. Some of these factors include racial segregation, high unemployment, high poverty rates, poor housing conditions, high rates of certain health conditions, lower educational opportunity, and barriers to accessing financing and investment (Jargowsky 2015; Cashin 2004). In addition, research has found that these factors also show up in the energy sector, as lower-income households and communities of color are more likely to live in older, poorly insulated homes with older, inefficient heating systems (Cluett, Amann, and Ou 2016). In addition, people living in rental properties may lack control over heating and/or cooling systems and appliances, which makes it difficult to influence decisions that might improve the efficiency of their homes.

ACEEE research has found that low-income weatherization and energy efficiency retrofits can reduce household energy burden by 25% on average (Drehobl, Ross, and Ayala 2020). Beyond simply lowering energy bills—thereby providing families with more disposable income for other necessities beyond energy—efficiency upgrades can also improve health and comfort. In fact, in its evaluation of the Weatherization Assistance Program, DOE found that the value of nonenergy benefits greatly exceeded the value of energy savings (Tonn et al. 2014).

Efforts to improve the reach of energy efficiency programs that serve income-qualified customers face several unique barriers and challenges. A 2019 study found that 11 large investor-owned utilities across six states had distributional disparities in low-income investments, meaning that they did not spend energy efficiency dollars in proportion to the size of low-income customer populations (Reames, Stacey, and Zimmerman 2019). Additionally, a 2018 report found that only 6% of U.S. energy efficiency spending in 2015 was dedicated to low-income programs (EDF 2018). Low-income households may face prohibitive up-front costs for energy efficiency investments and therefore benefit from low-income-focused programs that address this. Another barrier for low-income customers—who are more likely to be renters—is the so-called split incentive between renters and landlords. Simply put, there is a lack of motivation for landlords to invest in efficiency upgrades when they do not themselves pay for utilities. To help overcome these challenges, regulators can play a key role in encouraging or requiring utilities to carefully consider and expand the role of income-qualified energy efficiency programs within their portfolios.

In recognition of the efforts undertaken by states to strengthen utility-led low-income energy efficiency programs, we added an additional scoring metric beginning with the *2017 State Scorecard* to highlight examples of effective policy drivers that we continue to score, including:

- The adoption of state legislation, regulations, or commission orders establishing a savings goal or minimum required level of spending on low-income energy efficiency programs
- The development of cost-effectiveness rules that account for the additional benefits that energy efficiency delivers to income-qualified customers, such as NEB quantification, adders, or exemption of these programs from cost-effectiveness testing.

States can utilize a variety of policy mechanisms to ensure that levels of investment in or savings from income-qualified energy efficiency programs meet a minimum threshold. In the case of Pennsylvania, the public utility commission has 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 cases, however, low-income program requirements take the form of a legislative spending set-aside, through either the creation of a separate fund that receives a minimum annual contribution from ratepayers or a requirement that utilities spend a minimum amount or percentage of their revenues on low-income programs. For example, the Future Energy Jobs Act (SB 2814) passed in Illinois in December 2016 directed ComEd and Ameren Illinois to invest $25 million and $8.35 million per year, respectively, on low-income energy efficiency measures. Similarly, in August 2016, New Hampshire's public utilities commission, in an approved settlement agreement establishing a statewide EERS, increased the minimum low-income share of the overall energy efficiency budget from 15.5% to 17%. Minnesota legislation requires municipal gas and electric utilities to spend at least 0.2% of their gross operating revenue from residential customers on income-qualified programs, and investor-owned natural gas utilities must spend 0.4% of their gross operating revenue from residential customers on such programs. In other states, such as Connecticut and Michigan, utilities are simply required to see that budgets allocated to low-income programs are proportional to the revenues they expect to collect from that sector. Descriptions of state rules and regulations

establishing minimum levels of investment in low-income energy efficiency can be found in Appendix M.

Our scoring metric also recognizes public utility commissions that encourage investment in low-income energy efficiency programs by adapting cost-effectiveness screening and testing to give added consideration to the multiple important nonenergy benefits these programs produce, such as health and safety improvements. In some states, such as Illinois, Iowa, and Michigan, regulations clearly state that low-income programs are exempt from cost-effectiveness tests; in other states these exemptions may be granted in practice without being clearly stated or codified. Given the variation in policies and practices treating the cost effectiveness of income-qualified programs, some of which are established implicitly rather than explicitly within commission orders, we have tried to exercise flexibility in assigning points within this category.

Other approaches taken by program administrators to accommodate the higher costs and unique benefits of low-income programs include lowering the cost-effectiveness threshold for such programs or incorporating a percentage adder to approximate the nonenergy benefits that may otherwise be lost in a given cost–benefit calculation (as in Colorado and Vermont). In other cases, states have established methods to measure and calculate specific nonenergy benefits for inclusion in program screening. Still other states take a hybrid approach, utilizing an adder as well as incorporating NEBs that are easy to measure. Descriptions of each state's utility cost-effectiveness rules specific to low-income programs can be found in Appendix N.

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.

A state could earn up to 1 point in this category. To earn full credit, a state must have a legislative or regulatory requirement establishing minimum spending and/or savings levels for efficiency programs aimed specifically at low-income households, as well as established cost-effectiveness screening practices that accommodate or recognize the multiple nonenergy benefits of low-income energy efficiency programs. Alternatively, a state could earn full credit by demonstrating that utility spending for such programs equaled or exceeded $13 per income-qualified resident, based on the number of state residents below 200% of the federal poverty level according to the U.S. Census Bureau and Bureau of Labor Statistics.

States could earn 0.5 points if they had in place at least one of the two aforementioned policy instruments, or if they demonstrated that spending on low-income programs equaled or exceeded $6.50 per income-qualified resident.

Table 20 describes the scoring methodology.

Table 20. Scoring of support of low-income energy efficiency programs

Scoring criteria for low-income energy efficiency programs	Score
Legislative/regulatory requirements have established minimum spending or savings levels for low-income energy efficiency programs, *and* utility cost-effectiveness rules or exceptions have been established to provide flexibility for low-income programs. or Levels of spending on low-income energy efficiency equal or exceed $13 per income-qualified resident.	1
Legislative/regulatory requirements have established minimum spending or savings levels for low-income energy efficiency programs, *or* utility cost-effectiveness rules or exceptions have been established to provide flexibility for low-income programs. or Levels of spending on low-income energy efficiency are between $6.50 and $12.99 per income-qualified resident.	0.5

Table 21 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 the *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 Weatherization Assistance Program (WAP) grant allocations. However, where utility or state funds have been deployed to support or supplement WAP programs or projects, we do include these in table 21.

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. In order to credit these efforts within 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 21.

Table 21. State scores for support of low-income energy efficiency programs

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	2019 utility spending on low-income programs	2019 state spending on low-income programs per income-qualified resident*	Score (1 pt.)
Massachusetts	Yes[a]	Yes[d]	$130,302,412	$90.49	1
Rhode Island	No	Yes[d]	$19,829,994†	$75.98	1
Vermont	Yes[a]	Yes[g]	$10,300,000†	$72.54	1
Connecticut	Yes[abc]	Yes[e]	$31,144,990	$38.93	1
California	Yes[c]	Yes[f]	$415,883,884	$34.64	1
New Hampshire	Yes[a]	Yes[e]	$7,615,050‡	$32.54	1
Hawaii	No	No	$9,000,000	$30.10	1
Pennsylvania	Yes[bc]	Yes[e]	$92,176,986	$27.78	1
Illinois	Yes[a]	Yes[e]	$85,341,000	$26.95	1
Alaska	No	No	$4,700,000†	$23.04	1
Maryland	No	Yes[e]	$25,431,357†	$21.09	1
District of Columbia	Yes[a]	Yes[g]	$4,037,174†	$19.99	1
Montana	Yes[a]	Yes[e]	$5,298,163†	$16.87	1
Maine	Yes[a]	Yes[d]	$5,318,643†	$15.69	1
New Jersey	No	Yes[e,g]	$28,020,341	$15.29	1
Michigan	Yes[a]	Yes[e]	$37,835,679	$14.39	1
Minnesota	Yes[a]	Yes[e]	$17,732,767	$14.31	1
Oregon	Yes[a]	Yes[e]	$14,350,187	$13.09	1
Delaware	Yes[a]	Yes[d]	$2,568,774†	$11.62	1
New York	Yes[a]	Yes[e]	$62,757,043	$11.09	1
Oklahoma	Yes[a]	Yes[f]	$9,190,764	$7.41	1
Nevada	Yes[a]	Yes[e]	$4,719,105†	$5.15	1
New Mexico	Yes[a]	Yes[g]	$2,655,991	$3.15	1
Texas	Yes[a]	Yes[e]	-	-	1
Virginia	Yes[a]	Yes[e]	-	-	1
Wisconsin	Yes[a]	Yes[e]	-	-	1
Missouri	No	Yes[e]	$15,117,217	$8.91	0.5
Colorado	No	Yes[g]	$11,284,525†	$8.84	0.5
Iowa	No	Yes[e]	$4,595,799	$6.23	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	2019 utility spending on low-income programs	2019 state spending on low-income programs per income-qualified resident*	Score (1 pt.)
Idaho	No	Yes[g]	$3,297,658	$6.08	0.5
Utah	No	Yes[g]	$4,093,339†	$5.77	0.5
Washington	No	Yes[e]	$7,500,000†	$4.50	0.5
Tennessee	No	Yes[e]	$9,225,752	$4.48	0.5
North Carolina	No	Yes[e]	$6,822,616	$1.97	0.5
Florida	No	Yes[e]	$7,215,685	$1.05	0.5
Georgia	No	Yes[e]	$2,959,612	$0.82	0.5
Arizona	No	Yes[e]	-	-	0.5
Arkansas	No	Yes[e]	-	-	0.5
Indiana	No	Yes[e]	-	-	0.5
Kansas	No	Yes[e]	-	-	0.5
Kentucky	No	Yes[e]	-	-	0.5
Mississippi	No	Yes[e]	-	-	0.5
Ohio	No	Yes[e]	-	-	0.5
South Carolina	No	Yes[e]	-	-	0.5
West Virginia	No	No	$712,183	$1.14	0
Nebraska	No	No	$342,784†	$0.72	0
Louisiana	No	No	$1,065,933	$0.63	0
Wyoming	No	No	$16,023	$0.10	0
Alabama	No	No	-	-	0
North Dakota	No	No	-	-	0
South Dakota	No	No	-	-	0

* 2018 low-income population based on number of residents below 200% of the federal poverty level, according to U.S. Census Bureau and Bureau of Labor Statistics 2019 Current Population Survey (CPS) Annual Social and Economic (ASEC) Supplement. † At least a portion of spending includes non-ratepayer/state-subsidized program funds. ‡ 2018 ratepayer funds. [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] Multiplicative adder is applied to approximate low-income NEBs.

Leading and Trending States: Low-Income Energy Efficiency Programs

Virginia. The state has taken significant steps in recent years to strengthen efficiency offerings for low-income customers, including provisions in the 2018 Grid Transformation & Security Act (GTSA), which called upon the state's investor-owned utilities to greatly ramp up overall efficiency spending and established minimum funding levels for programs benefiting low-income customers. The Virginia Clean Economy Act, signed in April 2020, includes additional measures to reduce the low-income energy burden, including raising minimum funding levels from 5% to 15% for programs for low-income, elderly, or disabled individuals as well as veterans. The VCEA also establishes a percentage of income payment program (PIPP) to cap monthly electric utility payments for such ratepayers at 6% or 10% (for those with electric heat). Other environmental justice measures call for considering low-income areas, areas near fossil fuel infrastructure, and historically disadvantaged communities when planning new renewable projects, energy programs, and job training.

New York. In mid-2020, the New York State Energy Research and Development Authority (NYSERDA) and the state's investor-owned utilities (IOUs) introduced a new framework that will invest $880 million through 2025 to improve access to energy efficiency and clean energy solutions for low-to-moderate-income (LMI) households and affordable multifamily buildings. The plan will help to provide an enhanced and more coordinated and consistent approach to LMI services across the state. The framework will more than double the number of these households and buildings receiving energy efficiency services and increase the outreach, education, and community-based support programs for efficiency improvements. The initiative will also expand ongoing efforts to advance buildings electrification via research and analysis of institutional barriers for LMI communities. The plan will support the state's Climate Leadership and Community Protection Act while ensuring that its goals are reached in a just and equitable manner (New York Office of the Governor 2020).

Colorado. Xcel Energy's Low-Income Program provides a range of weatherization services and other energy efficiency measures for income-qualified customers through a multipronged approach and partnership with several nonprofit organizations. As administrator, Xcel Energy performs engineering analysis to determine cost effectiveness and approve rebates. The utility works with Energy Outreach Colorado (EOC), an independent nonprofit created by the state. EOC leverages multiple funding sources to create and expand low-income energy assistance programs. For example, Xcel and EOC developed a single-family program serving households making up to 80% of area median income to reach previously ineligible participants. Since 2009 the partnership among Xcel, EOC, and other participants has served 38,000 households, leveraged $5 million in outside funding, and saved 45 GWh and 5 million therms.

District of Columbia. The DC Council's adoption of the Clean and Affordable Energy Act of 2008 authorized the DC Sustainable Energy Utility (DCSEU) to establish a separate Energy Assistance Trust Fund (EATF). The EATF was to be used solely to fund low-income programs in the amount of $3.3 million annually. For the 2017–2021 program cycle, the low-income spending requirement was raised to 20% of expenditures ($3.9 million), with the addition of an annual low-income goal to save 46,556 MMBtus in electricity and natural gas. DCSEU's Low-Income Multifamily Custom Program, which began in October 2017, has already shown success, providing improvements to 20 properties comprising 1,770 housing units in its first year while building a strong network of key multifamily stakeholders (Samarripas and York 2019).

Massachusetts. According to Massachusetts's 2008 Green Communities Act, a minimum of 10% of electric utility budgets and 20% of gas utility budgets must serve income-qualified residents. These programs are delivered by the Low-Income Energy Affordability Network (LEAN), an association of community action agencies. LEAN coordinates administration of government- and utility-funded energy efficiency services to income-qualified customers, leveraging multiple funding sources and standardizing various program rules and eligibility requirements. LEAN also regularly hosts meetings in which utilities and nonprofit agencies discuss program and funding consistency and review potential new measures.

State policies enabling fuel switching and beneficial electrification in buildings

The past several years have seen a surge in states setting or strengthening clean energy goals, with almost half of the states now pledging to reduce greenhouse gas emissions and more than a dozen aiming for 100% carbon-free or net-zero electricity (NRDC 2020). To meet these goals, program administrators in several states are promoting electrification of space and water heating as an important building decarbonization tool. Policies of this type enable incentives for technologies like air and ground source heat pumps to displace direct fossil fuel use and can reduce emissions by shifting end uses onto the electric grid as it grows cleaner alongside a higher penetration of renewable energy sources.

While regulators in a handful of states have taken proactive steps to create or clarify rules and guidelines surrounding fuel switching, striking a balance among policy levers addressing energy efficiency in order to reduce power sector emissions, strategic electrification is a still-emerging field. Typically state energy efficiency policies address fuel types in isolation without considering the net societal and participant benefits of fuel-switching technologies. Sometimes fuel-switching programs are expressly prohibited by state rules; in other states, uncertainty or lack of state guidance has also impeded electrification efforts.

ACEEE research has begun to track the details of the current state policy landscape as it pertains to fuel switching in order to inform efforts by regulators and program administrators to design fuel-switching programs that are beneficial—i.e., that transition from higher-cost, higher-emitting fuel sources for heating to lower-cost, lower-emitting fuel sources (ACEEE 2020c). Generally we have found that state policies fall into five categories:

- Fuel switching is addressed through guidelines or fuel-neutral goals. Note that a state in this category may have set goals but may not yet have adjusted other factors like cost-effectiveness testing and potential studies.
- Supportive policies are in in place, with additional specific guidance or rules pending.
- There is no policy, but utilities or program administrators have received approval for fuel switching or substitution programs in certain cases.
- Fuel switching or substitution is prohibited or discouraged.
- No fuel-switching or substitution policies or programs are in place.

Table 22 below captures our current classification of state fuel switching policies, or lack thereof, as of July 2020. In on our ongoing effort to align the *State Scorecard* with emerging best practices, we are exploring ways to introduce a new scoring metric that recognizes the work of leading states to harmonize energy efficiency rules with electrification in a way that maximizes their public benefit by reducing costs and meeting climate goals. As one can see, more than half of states have no relevant policy in place, while 11 explicitly prohibit or discourage fuel-switching measures. For the few leading states—mostly located in the

Northeast—more details can be found in ACEEE's April 2020 policy brief on state fuel switching rules, which we plan to update as new practices emerge.[42]

Table 22. Fuel-switching policy status by state

Policy status	West	Midwest	South	Northeast
Fuel switching is addressed through guidelines or fuel-neutral goals (5 states)	Alaska, California		Tennessee	Massachusetts, Vermont
Supportive policies are in place, with additional specific guidance or rules pending (5 states)	Colorado			Connecticut, Maine, New Jersey, New York
No policy, but utilities have received approval for fuel substitution programs in certain cases (8 states and DC)		Illinois, Michigan, Wisconsin	Alabama, Georgia	Delaware, District of Columbia, New Hampshire, Rhode Island
Fuel switching or substitution is prohibited or discouraged (11 states)	Arizona, Washington	Kansas, Minnesota, Oklahoma	Arkansas, Louisiana, South Carolina, Texas, West Virginia	Pennsylvania
No policy is in place (21 states)	Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Wyoming	Indiana, Iowa, Missouri, Nebraska, North Dakota, Ohio, South Dakota	Florida, Kentucky, Mississippi, North Carolina, Virginia	Maryland

[42] The brief can be found at aceee.org/policy-brief/2020/04/state-policies-and-rules-enable-beneficial-electrification-buildings-through.

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 28% of economy-wide GHG emissions (EPA 2020b). 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. Starting with the Energy Independence and Security Act of 2007, the federal government has addressed vehicle energy use through joint GHG and fuel economy standards for light- and heavy-duty vehicles. However, the federal government has recently rolled back federal light-duty standards, putting a spotlight on the role of states in maintaining progress on fuel efficiency. 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 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 accommodate recent trends in state policy, we have added two new metrics this year that reflect action on the deployment of electric vehicles. We now score states on whether or not they have additional registration or road fees for EVs in place, and on the number of available charging locations per capita.

SCORING AND RESULTS

At the national level, the current administration's recent rollback of the light-duty fuel economy and GHG standards calls for a 1.5% nominal annual increase in fuel efficiency instead of the 4-5% improvement that would have taken effect for model year 2021–2026 vehicles. As a result, the states' role in ensuring continued progress toward high-efficiency vehicles is all the more critical.[43]

We awarded states that have adopted California's vehicle-emissions standards 1 point. Washington State is the most recent state to adopt these standards, and Nevada, New Mexico, and Minnesota have signaled their intention to adopt. Given the efficiency gains achievable through vehicle electrification, we gave states that also adopted California's light-duty Zero-Emission Vehicle (ZEV) program 0.5 points. States with more than 30 registered EVs per 100,000 people qualified for an additional 0.5 points, and those with more than 70 EVs per 100,000 earned 1 full additional point. Similarly, states with 15 public charging stations per 100,000 people earned 1 point, and those with more than eight public charging locations per 100,000 people earned 0.5 points. The only chargers we counted were non-brand-specific L2 and DCFC chargers with CHAdeMO, CCS, or J1772 compatibility that were installed and publicly

[43] 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.

available for use as of October 25, 2020.[44] We also evaluated state fees for electric vehicles and awarded 1 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 from the average individual driver. States where the EV fee is from 101% to 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 the way in improving the efficiency of transportation systems more broadly. This includes taking steps to promote the use of less energy-intensive transportation modes. States that have a dedicated revenue stream for 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. For details, see Appendix H. States also received points based on the magnitude of their transit spending. Per capita spending of $100 or more received 1 point, while expenditures of $20 or more but below $100 per capita received 0.5 points.

Policies that promote compact development and ensure the accessibility of major destinations are essential to reducing transportation energy use in the long term. States with smart growth statutes earned 1 point. Twenty-three states earned points in this category. These statutes include the creation of zoning overlay districts, such as the New Hampshire RSA 9-B program, as well as various other incentives to encourage development patterns that reduce the need to drive.

States that adopted reduction targets for vehicle miles traveled (VMT) or transportation-specific GHG reduction goals statewide 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 (2007–2016, 2008–2017, and 2009–2018) 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 but below 5% earned 0.5 points. One state, New York, as well as the District of Columbia, earned the full point for this metric. We also awarded 0.5 points to states with complete streets statutes, which ensure adequate attention to the needs of pedestrians and cyclists in all road projects.

Regarding freight system efficiency, we changed our methodology this year so that states could earn 0.5 points if the objectives of their freight plans specifically include reducing GHG emissions or energy consumption or shifting modes to more efficient forms of freight movement. They could earn an additional 0.5 points if their freight plans included 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 and an additional 0.5 points if they use

[44] 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 considered scoring for this year's scorecard.

distance from transit facilities as a criterion for awarding federal low-income tax credits to qualifying property owners.

Table 23 shows state scores for transportation policies. ACEEE recognizes that due to variations in states' 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. Additional details on incentives for the purchase of high-efficiency vehicles, state transit funding, and transportation legislation are included in Appendixes G, H, and I.

Table 23. Transportation policies by state

State	GHG tailpipe emissions standards and ZEV program (1.5 pts.) [1]	EV registrations per 100,000 people (1 pt.) [2]	EV fees[3] (1 pt.)	EVSE[4] (1 pt.)	High-efficiency consumer incentives[5] (0.5 pts.)	VMT targets (1 pt.) [6]	Average % change in VMT per capita (1 pt.) [7]	Integration of transportation and land-use planning (1 pt.) [8]	Complete streets legislation (0.5 pt.) [9]	Transit funding (1 pt.) [10]	Dedicated transit revenue stream statutes (0.5 pts.) [11]	Freight system efficiency goals (1 pt.) [12]	Equitable access (1 pt.) [13]	Total score (12 pts.)
District of Columbia	1.5	1	1	1	0.5	1	1	1	0.5	1	0	0.5	1	11
California	1.5	1	1	1	0.5	1	0	1	0.5	0.5	0.5	1	1	10.5
New York	1.5	1	1	0.5	0.5	1	1	1	0.5	1	0.5	0.5	0.5	10.5
Massachusetts	1.5	1	1	0.5	0.5	1	0	1	0.5	1	0.5	0.5	1	10
Maryland	1.5	1	1	0.5	0	1	0	1	0.5	1	0.5	0.5	1	9.5
Connecticut	1.5	1	1	0.5	0.5	0	0	1	0.5	1	0	0.5	1	8.5
Oregon	1.5	1	1	0.5	0.5	1	0	1	0.5	0	0.5	0.5	0.5	8.5
Vermont	1.5	1	1	1	0.5	1	0.5	1	0.5	0	0	0.5	0	8.5
Washington	1.5	1	1	0.5	0.5	1	0.5	1	0.5	0	0.5	0	0.5	8.5
Rhode Island	1.5	1	1	0.5	0	0	0.5	1	0.5	0.5	0	0.5	1	8
Colorado	1.5	1	1	1	0.5	0	0.5	0	0.5	0	0.5	0.5	0.5	7.5
Maine	1.5	1	1	0.5	0.5	0	0	1	0.5	0	0.5	0.5	0.5	7.5
Minnesota	0.5	1	1	0	0	1	0.5	0	0.5	0.5	0.5	0.5	1	7
New Jersey	1.5	1	1	0	0.5	0	0	1	0.5	0.5	0	0.5	0.5	7
Delaware	1	1	1	0	0.5	0	0	1	0.5	1	0	0.5	0	6.5
Pennsylvania	1	1	1	0	0.5	0	0.5	0	0.5	1	0.5	0.5	0	6.5
Hawaii	0	1	1	1	0	0	0	1	0.5	0	0.5	0.5	0.5	6
Virginia	0	1	1	0	0.5	0	0.5	1	0.5	0.5	0.5	0	0.5	6
Michigan	0	1	1	0	0	0	0	1	0.5	0.5	0.5	0.5	0.5	5.5
Arizona	0	1	1	0	0.5	0	0.5	1	0	0	0	0.5	0.5	5

State	GHG tailpipe emissions standards and ZEV program (1.5 pts.) [1]	EV registrations per 100,000 people (1 pt.) [2]	EV fees[3] (1 pt.)	EVSE[4] (1 pt.)	High-efficiency consumer incentives[5] (0.5 pts.)	VMT targets (1 pt.) [6]	Average % change in VMT per capita (1 pt.) [7]	Integration of transportation and land-use planning (1 pt.) [8]	Complete streets legislation (0.5 pt.) [9]	Transit funding (1 pt.) [10]	Dedicated transit revenue stream statutes (0.5 pts.) [11]	Freight system efficiency goals (1 pt.) [12]	Equitable access (1 pt.) [13]	Total score (12 pts.)
Florida	0	1	1	0	0	0	0.5	0	0.5	0	0.5	0.5	1	5
Illinois	0	1	0	0	0	0	0	1	0.5	1	0.5	0.5	0.5	5
Tennessee	0	1	1	0	0	0	0	1	0.5	0	0.5	0.5	0.5	5
North Carolina	0	1	1	0	0	0	0	1	0.5	0	0.5	0.5	0	4.5
Utah	0	1	1	0.5	0.5	0	0	0	0.5	0	0.5	0.5	0	4.5
Nevada	0.5	1	1	0	0	0	0	0	0.5	0	0	0.5	0.5	4
Alaska	0	1	1	0	0	0	0.5	0	0	1	0	0	0	3.5
Iowa	0	0.5	1	0	0	0	0	1	0	0	0.5	0.5	0	3.5
New Hampshire	0	1	1	0	0	0	0	1	0	0	0	0.5	0	3.5
New Mexico	0.5	1	1	0	0	0	0	0	0	0	0	0.5	0.5	3.5
Texas	0	1	1	0	0.5	0	0	0	0.5	0	0	0.5	0	3.5
Oklahoma	0	1	1	0	0.5	0	0.5	0	0	0	0	0.5	0	3.5
Indiana	0	1	0	0	0	0	0	0	0.5	0	0.5	0.5	0.5	3
Kentucky	0	0.5	1	0	0	0	0	0	0	0	0	0.5	1	3
Louisiana	0	0.5	1	0	0.5	0	0	0	0.5	0	0	0.5	0	3
Missouri	0	1	0	0	0	0	0	0	0.5	0	0	0.5	1	3
Montana	0	1	1	0	0	0	0	0	0	0	0	0.5	0	2.5
South Carolina	0	0.5	1	0	0	0	0	0	0.5	0	0	0.5	0	2.5
Wisconsin	0	1	1	0	0	0	0	0	0	0	0	0.5	0	2.5
Kansas	0	1	0	0	0	0	0	0	0	0	0.5	0.5	0	2
Nebraska	0	0.5	1	0	0	0	0	0	0	0	0	0.5	0	2

State	GHG tailpipe emissions standards and ZEV program (1.5 pts.) [1]	EV registrations per 100,000 people (1 pt.) [2]	EV fees[3] (1 pt.)	EVSE[4] (1 pt.)	High-efficiency consumer incentives[5] (0.5 pts.)	VMT targets (1 pt.) [6]	Average % change in VMT per capita (1 pt.) [7]	Integration of transportation and land-use planning (1 pt.) [8]	Complete streets legislation (0.5 pt.) [9]	Transit funding (1 pt.) [10]	Dedicated transit revenue stream statutes (0.5 pts.) [11]	Freight system efficiency goals (1 pt.) [12]	Equitable access (1 pt.) [13]	Total score (12 pts.)
North Dakota	0	0.5	0	0	0	0	0	1	0	0	0	0.5	0	2
South Dakota	0	0.5	1	0	0	0	0.5	0	0	0	0	0	0	2
Georgia	0	1	–1	0	0	0	0	0	0.5	0	0.5	0	0.5	1.5
Idaho	0	1	0	0	0	0	0	0	0	0	0	0	0	1
West Virginia	0	0	0	0	0	0	0	0	0.5	0	0.5	0	0	1
Alabama	0	0.5	–1	0	0	0	0	0	0	0	0.5	0.5	0	0.5
Mississippi	0	0	–1	0	0	0	0.5	0	0.5	0	0	0.5	0	0.5
Ohio	0	1	–1	0	0	0	0	0	0	0	0	0.5	0	0.5
Wyoming	0	0.5	–1	0	0	0	0.5	0	0	0	0	0.5	0	0.5
Arkansas	0	0	–1	0	0	0	0	0	0	0	0.5	0.5	0	0

Sources: [1] Lutsy and Slowik 2019. [2] IHS Automotive Polk 2020; state data requests. [3] DOE 2020b. [4] DOE 2020b. [5] DOE 2020a. [6] State legislation. [7] FHWA 2020. [8] State legislation. [9] NCSC 2018. [10] AASHTO 2020. [11] State legislation. [12] State freight plans. [13] State legislation.

DISCUSSION

Tailpipe Emissions Standards and the Zero-Emission Vehicle Program

The U.S. Department of Transportation (DOT) has regulated the fuel economy of automobiles since 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 law in the United States 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 to increase 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 the California Air Resources Board (CARB) have had harmonized standards for fuel economy and GHG emissions. In 2010 the agencies set new GHG and fuel economy standards for model years 2012 through 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, and 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. As the state challenges the decision, other states' adoption and support of California's standards will be critical in maintaining California's authority and progress toward clean, fuel-efficient vehicles. California has also updated its Zero-Emission Vehicle (ZEV) program, requiring a more ambitious increase in sales of 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 regarding the number and type of ZEVs they must produce and deliver for sale (C2ES 2017).

Fourteen states and the District of Columbia now use California's GHG regulations: Colorado, Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington (Lutsy and Slowik 2019). (Arizona and Florida also adopted California's standards but repealed them in 2012.) Washington is the most recent state to adopt these standards, finalizing its rule in March 2020. Nevada, New Mexico, and Minnesota are

planning to adopt California's standards. Twelve of these states and the District of Columbia have adopted California's ZEV requirements as well.

Electric Vehicle and Charging Infrastructure Deployment

As more EVs become available to drivers and electric vehicles become a critical part of state strategy to address transportation GHG emissions, states can help remove the barriers to their widespread 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. The numbers of EV registrations and publicly available charging stations per capita in a given state are indicative of the success of a state's policies to increase the uptake of electric vehicles. Due to feedback we have received, we are considering using the number of charging ports instead of the number of charging stations in the next *State Scorecard*.

State EV Fees

Projections anticipate a steep increase in the rate of EV penetration across the country. As electric vehicle 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, Maine, 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 the maintenance of the roads they drive on, there are several issues that these surcharges bring 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 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 much more than the average gasoline vehicle in the United States at 15,000 miles a year and gets a mere 20 miles per gallon—and therefore pays more than $270 annually in gasoline taxes (Stradling 2019). Finally, EV fees in many states do not take into consideration 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 in the *State Scorecard* we did not credit policies that promote their purchase. 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 growth in total VMT 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 2019a). 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:

- 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

Complete Streets Policies

Complete streets policies focus on street connectivity and aim to create safe, easy access to roads for all pedestrians, bicyclists, motorists, and public transportation users. Such policies foster increased use of alternatives to driving and thus can contribute to reducing fuel consumption. According to the National Complete Streets Coalition, modest increases in biking and walking could save 2.4 billion gallons of fuel annually across the country (NCSC 2012). A complete streets policy directs states' transportation agencies to evaluate and incorporate complete streets principles and tasks transportation planners with ensuring that all roadway infrastructure projects allow for equitable access to and use of those roadways.

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, in 2018 Alabama established a trust fund under the Alabama Public Transportation Act to increase public transportation options in the state.

Freight

Many states have freight transportation plans in place. The federal Fixing America's Surface Transportation (FAST) Act, adopted in 2015, superseded the Moving Ahead for Progress in the 21st Century (MAP-21) Act. FAST requires states to develop short- and long-range freight plans in order to receive federal funds for freight projects. Final plans were required by December 2017. Additionally, FAST created a separate pot of money for intermodal and rail freight projects. Each state is allowed to set aside up to 10% of federally awarded funds for eligible non-highway projects (114th Congress 2015). Pursuant to FAST, states must also include multimodal strategies in their freight plans.

These plans can be strengthened by 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 cities have sprawled and jobs have moved away from urban cores in the United States, 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 a number of 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.

Chapter 4. Building Energy Efficiency Policies

Author: Chris Perry

INTRODUCTION

Buildings consume 75% of the electricity and 40% of the total energy used in the United States and account for 36% of all U.S. carbon dioxide emissions (EIA 2020c).[45] This makes buildings an essential target for energy savings. Because buildings have long life spans and retrofits are often complex or costly, encouraging building efficiency measures during design and construction is one of the most effective ways to reduce building energy consumption. Mandatory building energy codes require a minimum level of energy efficiency for new residential and commercial buildings as well as major alterations and additions. Benchmarking and transparency policies also promote efficiency by informing building owners about their energy consumption. Policies encouraging energy rating and labeling of homes can help to further transform the market by enabling prospective buyers to make informed decisions about the true long-term energy costs they would be taking on.

Building Energy Code Adoption

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

Most commercial building codes are based on ASHRAE 90.1 standards, jointly developed by ASHRAE (formerly the American Society of Heating, Refrigerating and Air-Conditioning Engineers) and the Illuminating Engineering Society (IES). The IECC commercial building code tends to adopt many of the prescriptive and performance requirements of the ASHRAE 90.1 code to ensure continuity between the two codes.

With the publication of each new edition of the IECC and ASHRAE standards, DOE issues determinations on the codes that ascertain their relative impact compared with older standards and establish, if justified, the latest iteration as the base code that all states must comply with. Within two years of the final determination, states are required to send letters either certifying their adoption, requesting an extension, or explaining their decision not to comply.[46] Some states, such as Maryland, Massachusetts, and Illinois, are required by statute to adopt the most recent version of the IECC within 12–18 months of publication.

In 2019 the ICC undertook the process of updating a number of its codes, including the 2021 residential and commercial IECC. Early in 2019, the ICC solicited proposal changes from the public, and in the summer and fall of 2019 it held hearings on these potential updates to the IECC for the 2021 version. The ICC held an online vote among its members in November

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

[46] Federal statute requirements are relatively weak, which helps explain why code adoption across different states is so varied.

and released the results in December 2019. Voting results showed the ICC membership overwhelmingly supported energy-efficient updates to the code.

The residential code will include a new flexible savings mechanism. This provision will allow builders to choose energy efficiency upgrades that work best for them to reduce energy use by 5%, with improvements ranging from better insulation to more efficient air conditioners and water heaters. In addition, an optional zero-energy appendix will provide a simple pathway for leading cities and states to require much higher levels of performance than in the standard IECC. Local governments also overwhelmingly voted to include provisions for electric vehicle and electric appliance readiness as well as increased water heater efficiency, though these were unfortunately removed by the ICC Board of Directors upon appeal (ICC 2020). However, they may still be able to adopt these proposals as amendments to their state or local code.

The code is expected to be released in early 2021 and will be available for immediate adoption by cities and states. ACEEE and other advocacy groups conservatively estimate that the code will improve energy efficiency by 10% over the 2018 IECC (ACEEE 2020a). However, a DOE determination will provide a more accurate estimate.

Additionally, in October 2019, ASHRAE released its updated 90.1-2019 commercial building code. The latest version of 90.1 includes new provisions to improve envelope efficiency, reduce air leakage, increase lighting controls, and improve pump efficiency. Preliminary estimates are that the 2019 code is 5% more energy efficient than the 2016 version; however, a DOE determination will provide a more accurate estimate. Determinations are typically released one to two years following the publication of a code.

A number of states have adopted the latest available version of the residential code, the 2018 IECC, including Delaware, New Mexico, Vermont, New York, Nebraska, New Jersey, Illinois, Massachusetts, Maryland, and Nevada. Meanwhile Colorado, a home-rule state, passed HB 19-1260, requiring local jurisdictions to adopt one of the three most recent versions of the IECC. The majority of these states have adopted ASHRAE 90.1-2016 (or equivalent); however, with 90.1-2019 published at the end of 2019, some states are expected to begin reviewing and adopting this code.

Early building energy codes used a prescriptive approach, requiring compliance with a specific portfolio of building specifications and efficiency measures. However, over the past two decades, performance-based compliance options have been incorporated into codes, allowing builders flexibility to chart their own course as long as the building meets a minimum standard of modeled energy performance. For residential buildings, an additional type of performance path called the Energy Rating Index was introduced in the 2015 IECC. This path involves target scores in a range of 0 to 100, where 100 represents the 2006 IECC and 0 represents a zero-energy building. The required score differs among climate zones.

At the same time, a number of states and communities have taken steps to move toward zero-energy standards for new and existing construction. A zero-energy building (ZEB) is one that produces at least as much energy as it uses, usually measured over the course of a year. This performance is achieved through energy efficiency and renewable energy technologies.

In recent years, the concept of zero energy (ZE) has increasingly taken hold among building designers and clean energy communities, prompting a growing pursuit of ZE-related targets and certifications, such as the American Institute of Architects' 2030 Challenge, the International Living Future Institute's Living Building Challenge, LEED Zero, and DOE's Zero Energy Ready Home program. States and localities have also developed more stringent building energy codes. Examples include the District of Columbia's zero-energy building code path, Oregon's executive order that requires zero-energy-ready home equivalence by 2023 (Oregon Office of the Governor 2017), Washington State's goal for a 70% reduction in energy consumption in new residential and construction by 2030, and city- and county-led efforts in Idaho and Colorado. Beyond mandating that all new homes be superefficient, California also requires rooftop PV for new construction. For the past decade the emphasis has been on advancing zero-net-energy buildings. The state is now pivoting to code requirements for low-GHG buildings, using metrics that will focus design and construction on decarbonization and demand flexibility to integrate with California's evolving clean energy grid (CEC 2020). Other active ZE plans are in place in Vermont, Rhode Island, the District of Columbia, New York, and Massachusetts. As building energy codes are amended to deepen energy savings and move states closer to ZE goals, interest is growing regarding outcome-based codes and the importance of calculating building energy savings.[47]

Building Energy Code Compliance

Robust implementation and enforcement are necessary to ensure that states will reap the benefits of adopted codes. A support network that includes DOE, the Pacific Northwest National Laboratory (PNNL), regional energy efficiency organizations (REEOs), and a variety of other local, regional, and national stakeholder groups provides technical training, educational resources, and advocacy to help states and communities reach their compliance goals.

DOE provides many resources to guide states in code compliance. In addition to funding compliance activities through grants, the agency provides technical assistance—such as model code adoption policies, compliance software, and training modules—through its Building Energy Codes Program. DOE recently completed the third phase of its single-family residential field study, which evaluated the code compliance of more than 4,500 homes across 25 states. The study concluded that the buildings industry is generally doing a good job complying with building energy codes; however, significant savings were still being left on the table. The study also found that, in many cases, these errors could be corrected through targeted education and training programs (Williams 2019). Additionally, DOE has funded studies on low-rise multifamily and commercial building codes compliance that are currently ongoing (Landry 2019; Cheslak 2019).

REEOs work closely and collaboratively within their regions and with one another to coordinate code-related activities that support adoption and compliance. They include the Northeast Energy Efficiency Partnerships (NEEP), the Southeast Energy Efficiency Alliance (SEEA), the Midwest Energy Efficiency Alliance (MEEA), the South-Central Partnership for

[47] While the focus of building energy codes historically has been to design energy-efficient buildings, outcome-based codes attempt to consider building operation and methods to measure ongoing energy use.

Energy Efficiency as a Resource (SPEER), the Southwest Energy Efficiency Project (SWEEP), and the Northwest Energy Efficiency Alliance (NEEA).[48] REEOs have played a vital role in helping to inform code adoption efforts, providing technical assistance, policy best practices, and analysis regarding cost effectiveness and potential energy savings of energy codes. Other pivotal REEO-led initiatives include increasing access to energy code training for builders, code officials, and architects and overseeing energy code stakeholder groups and collaboratives. The REEOs have also been key contributors to DOE's ongoing residential energy code field studies in Tennessee, Colorado, Arizona, Utah, Nevada, and many other states.

Other important stakeholders providing leadership and technical expertise on code adoption and enforcement include the National Association of State Energy Officials (NASEO) and the Responsible Energy Codes Alliance (RECA), among others.

In addition to participating in these regional and national efforts, states can take other actions to support code compliance. These include the following:

- Conducting a study—preferably every three to five years—to determine actual rates of energy code compliance, identify compliance patterns, and create protocols for measuring compliance and developing best-practice training programs
- Establishing a system, including programs and an evaluation methodology, that encourages utilities and other stakeholders to support code compliance and claim energy savings from doing so
- Offering training programs and/or adopting policies establishing minimum certification requirements for code enforcement officials, in order to increase the number and effectiveness of contractors and officials who implement codes and monitor and evaluate compliance. These programs and policies are most effective when based on data collected in compliance field studies. It is worth noting that professionals' participation in state-specific licensing, certification, and continuing education credit programs has been shown to be higher than their participation in national programs.

Utilities can promote compliance with state and local building codes in a number of ways. Many utilities across the country offer energy efficiency programs that target new construction. A handful of jurisdictions with EERS policies, including California, Massachusetts, Rhode Island, the District of Columbia, New York, and Arizona, have established programs that allow utilities to claim savings for code enhancement activities both for adoption and for compliance. Utilities can fund and administer training and certification programs, assist local jurisdictions with implementing tools that streamline enforcement, provide funding for purchasing diagnostic equipment, and help with compliance evaluation. For instance, Ameren Missouri offers a robust Residential Energy Code Support program for home builders, code officials, and other professionals. Utilities also can combine code compliance efforts with initiatives to improve energy efficiency beyond code requirements. To encourage utilities to participate, prudent regulatory

[48] These organizations cover all states except California, Hawaii, and Alaska.

mechanisms, such as program cost recovery or shared savings policies, must be in place to compensate them for their efforts.

Building Energy Use Transparency, Energy Performance Standards, and Home Energy Labeling

A significant challenge to improving efficiency in the housing sector has been a relatively low level of awareness and understanding among home buyers of the energy costs and energy-saving features of homes on the market. While miles-per-gallon stickers and Energy Guide labels have become dependable fixtures of the vehicle and home appliance markets, a lack of transparent energy use information has historically plagued the housing sector. Market signals are insufficient to direct consumers to the most efficient homes, leading to uninformed purchasing decisions and saddling home buyers with higher long-term costs than they had anticipated. This critical information gap has far-reaching ramifications that include not just bloated utility bills, but also the undervaluation of efficiency services, a concealment of vital knowledge about a home's maintenance and repair needs, and an excessive energy burden that may cause homeowners to forgo other important purchases.

Efficiency advocates and government agencies at all levels have worked to devise residential energy labeling programs and policies that inform home buyers and real estate stakeholders about a home's energy performance. Given differences in priorities among regions and stakeholders, a diverse patchwork of ratings with varying metrics and areas of focus has arisen to meet the challenge. Examples include:

- *Residential Energy Services Network (RESNET) Home Energy Rating System (HERS).*[49] Considered the industry standard, the HERS rating is required for a home to qualify for ENERGY STAR® certification, DOE Zero Energy Ready Home certification, and many energy efficiency programs that target new construction (Cluett and Amann 2013). ANSI/RESNET/ICC Standard 301-2014, known as the Energy Rating Index, is based on the HERS rating system; it is formally referenced as its own compliance path in the 2015, 2018, and 2021 IECC. The HERS allows builders flexibility in meeting code requirements and provides home sellers an opportunity to demonstrate the added energy-saving value of the home by including the score in real estate listings.
- *DOE Home Energy Score (HES).* Launched in 2012, HES has been used primarily for existing homes. HES rates homes on a 1–10 scale, with 10 being the most efficient, and provides guidance on recommended upgrades and how the upgrades will improve the home's score. The score has been incorporated into voluntary labeling initiatives in states including Alabama, Colorado, Connecticut, Massachusetts, and Oregon.[50] Starting in 2018, HES became mandatory in Portland, Oregon, at the time a property is listed for sale, with scores posted to the Multiple Listing Service.
- *Minneapolis Home Energy Score*. Minneapolis developed its own 0-to-100 rating covering a home's attic and wall insulation, heating system, and windows to meet

[49] RESNET is a national not-for-profit standard-setting membership organization accredited by the American National Standards Institute (ANSI) as a standards development organization.

[50] Many communities are also considering incorporating HES into their climate action plans as a way to spur retrofits.

its mandatory disclosure ordinance. Energy disclosure reports are now required on homes at the time of sale (Hudson 2020).

To help consumers navigate the varied and sometimes confusing landscape of residential energy labeling protocols, a number of state energy offices have partnered with organizations like NASEO and NEEP to strengthen the regional consistency of energy rating practices. These efforts include:

- *Energy Metrics to Promote Residential Energy Scorecards in States (EMPRESS).* An initiative led by state energy offices and supported by DOE and private partners, EMPRESS aims to coordinate and harmonize the software platforms for DOE's HES and RESNET's HERS ratings as well as to foster voluntary use of residential energy data by real estate market stakeholders and others (NASEO 2020). States involved in EMPRESS include Rhode Island, Massachusetts, Missouri, Arkansas, and Oregon.
- *Home Energy Labeling Information eXchange (HELIX).* Led by NEEP and supported by DOE, the six New England states and New York have together developed a database to help bridge the energy information gap between home sellers and the market. The system auto-populates real estate listings with verified independent home energy information from home energy labels, such as HES and HERS, solar PV data, and other available energy data (NEEP 2019). As of 2019, HELIX was available for all states to use as a policy management tool and to connect to local branches of the Multiple Listing Service.
- *Home Energy Information Accelerator.* One of 13 Better Buildings Accelerators launched by DOE since 2013, the Home Energy Information Accelerator is a collaboration among national, regional, state, and local leaders aimed at expanding the availability and use of reliable home energy information in residential real estate transactions, such as through listing services and other reports. Other goals include providing data standards and technical assistance.

Mandates for residential home energy labeling are more common in local jurisdictions than at the state level. However, voluntary state programs in Connecticut, Massachusetts, and Vermont have found success through a variety of policy levers, such as piggybacking labels onto existing energy efficiency programs. This can help increase exposure to consumers and build a case for more widespread implementation through demonstration of the increased market value associated with improved energy transparency (Faesy et al. 2014). By convening stakeholders and real estate interests to share perspectives, challenges, and opportunities through a consistent governance structure, states can help craft a successful labeling program that integrates with regional listing services and has the support of both home buyers and home sellers.

On the commercial side, a growing number of jurisdictions, including more than 25 cities, have established building energy benchmarking and transparency laws (IMT 2020). These require property owners, builders, or sellers to compile information about their buildings' energy use or energy efficiency characteristics and report these data to a central database and/or to prospective buyers at the time of sale. This information can then be used to evaluate building energy use patterns and identify energy efficiency opportunities. Several studies have demonstrated that benchmarking and transparency policies can be associated

with a 3–8% reduction in energy consumption or energy use intensity (EPA 2012; Mims et al. 2017).[51] Energy use transparency requirements are a fairly recent policy innovation. Commercial transparency policies are uncommon at the state level, with only California, Washington, the District of Columbia, and New Jersey requiring energy use disclosure upon sale or lease. Local governments are more likely to pursue these policies, but state governments can also use them to incentivize building stock upgrades.

Additionally, cities and a few states are starting to require Building Energy Performance Standards (BEPS). These standards, typically based on commercial buildings' energy use intensity (EUI), help to capture the ongoing energy consumption of existing buildings. This can help ensure that buildings are being operated efficiently, and if not, can identify adjustments and investments to improve energy performance. While these requirements are more prevalent in cities (e.g., New York City; Boulder, Colorado; and St. Louis), both Washington, DC, and Washington State have set BEPS requirements to be met starting in 2026 (Nadel and Hinge 2020).

Cities, states, and other jurisdictions are increasingly supplementing energy consumption metrics with carbon and GHG emissions metrics. For instance, New York City recently passed the landmark Climate Mobilization Act, which 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 bill includes sizable fines for failure to meet the requirements (New York City Council 2019).

GHG reduction goals go hand in hand with energy efficiency. As more jurisdictions start considering these new metrics, ACEEE intends to investigate the best methods for incorporating them into the *State Scorecard*.

METHODOLOGY

Our review of state building energy code stringency is based predominantly on publicly available information, such as that provided by the DOE Building Energy Codes Program, New Buildings Institute (NBI), RECA, and the national network of REEOs. It draws as well on the expert knowledge of individuals who are active in state building energy code policy and evaluation. We also relied on primary data collection to verify publicly available data, particularly for very recent or forthcoming code adoptions. We distributed a data request to energy offices and knowledgeable officials in each state, soliciting information on their efforts to measure and enforce code compliance.

While model codes are determined at the national level, states often amend these codes during the adoption process, thereby affecting the EUI of buildings constructed to that code. To more accurately capture the energy savings impact of these amendments, ACEEE worked with NBI to score building energy code stringency according to the modeled EUI of

[51] A study by the EPA showed that benchmarking energy use led to a 7% decrease in consumption across a sample of more than 35,000 buildings (EPA 2012). A Lawrence Berkeley National Laboratory (LBNL) review of state and local benchmarking and transparency studies found that most of the research indicated a 3–8% reduction in gross energy consumption or energy use intensity over a two- to four-year period of building and transparency policy implementation. The LBNL review, however, suggested that additional research be conducted to confirm energy impacts and determine causal relationships (Mims et al. 2017).

each code as measured by NBI's Zero Energy Performance Index (zEPI). A zEPI score of zero indicates a zero-energy building.[52]

SCORING AND RESULTS

States earned credit for residential and commercial building energy codes on the basis of two measures: the stringency of the codes and the level of activity to support code compliance. We also awarded points for efforts to improve the transparency of building energy use. This included awarding points for benchmarking and energy use transparency laws. Further, we continued to use a metric introduced in 2018 that tracks the number of home energy labels distributed annually as a percentage of new home construction, based on information received through our annual data request and from publicly available data from RESNET. We awarded points as follows:

- Code stringency
  - Residential energy code (2 points)
  - Commercial energy code (2 points)
- Code compliance
  - Compliance study (1 point)
  - Other compliance activities (1 point)
- Building energy use transparency
  - Residential and/or commercial benchmarking/transparency policies (1 point)
  - Existing building performance standards (1 point)
  - Zero-energy buildings (0.5 points)
  - Energy rating and labeling of homes (0.5 points)

As in past *Scorecards*, states could earn a maximum of 4 points for stringency. We also added metrics to recognize progress in two emerging areas: the adoption of building energy performance standards for existing buildings (so far only Washington State and the District of Columbia) and efforts to advance construction of ZEBs, which we measured using data on verified and emerging ZEBs from the New Buildings Institute. To accommodate these changes, we removed a previous metric that credited states for requiring code officials to complete energy efficiency–related training and certification.

Table 24 lists states' overall building energy code scores. Explanations of each metric follow.

[52] The zEPI system is based on a scale presented in a paper by Charles Eley, an energy efficiency advocate and New Buildings Institute fellow. The 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. To learn more about this scale, see Eley (2009). To learn more about the zEPI methodology, see newbuildings.org/code_policy/zepi/.

Table 24. State scores for building energy efficiency policies

State	Residential code stringency (2 pts.)	Commercial code stringency (2 pts.)	Compliance study (1 pt.)	Additional compliance activities (1 pt.)	Benchmarking and transparency (1 pt.)	Energy rating and labeling of homes (0.5 pts.)	Existing building standards (1 pt.)	Zero-energy buildings (0.5 pts.)	Total score (9 pts.)
District of Columbia	2	2	1	1	1	0	1	0.5	8.5
California	2	2	1	1	1	0	0	0.5	7.5
Washington	2	2	1	1	0.5	0	1	0	7.5
Hawaii	2	2	1	1	0.5	0	0	0.5	7
Massachusetts	2	2	1	1	0	0.5	0	0.5	7
Oregon	2	2	1	1	0	0.5	0	0.5	7
Connecticut	2	2	1	1	0	0.5	0	0	6.5
Michigan	2	2	1	1	0	0.5	0	0	6.5
Minnesota	2	2	1	1	0	0.5	0	0	6.5
Nevada	2	2	1	0.5	0	0.5	0	0.5	6.5
New Jersey	1.5	2	1	1	0.5	0.5	0	0	6.5
New York	2	2	1	1	0.5	0	0	0	6.5
Pennsylvania	2	2	1	1	0	0.5	0	0	6.5
Texas	2	2	1	1	0	0.5	0	0	6.5
Colorado	1.5	1.5	1	1	0	0.5	0	0.5	6
Florida	1.5	2	1	1	0	0.5	0	0	6
Illinois	2	2	1	1	0	0	0	0	6
Maryland	2	2	1	0.5	0	0.5	0	0	6
Nebraska	2	2	1	1	0	0	0	0	6
Rhode Island	1.5	2	1	1	0	0.5	0	0	6

State	Residential code stringency (2 pts.)	Commercial code stringency (2 pts.)	Compliance study (1 pt.)	Additional compliance activities (1 pt.)	Benchmarking and transparency (1 pt.)	Energy rating and labeling of homes (0.5 pts.)	Existing building standards (1 pt.)	Zero-energy buildings (0.5 pts.)	Total score (9 pts.)
Utah	1.5	2	1	1	0	0	0	0.5	6
Vermont	2	2	1	0.5	0	0	0	0.5	6
Alabama	1.5	2	1	1	0	0	0	0	5.5
Delaware	2	2	0	1	0	0.5	0	0	5.5
Idaho	1.5	2	1	1	0	0	0	0	5.5
Montana	2	1.5	1	1	0	0	0	0	5.5
New Hampshire	1.5	2	0	1	0	0.5	0	0.5	5.5
Virginia	1.5	2	1	0.5	0	0.5	0	0	5.5
Kentucky	1	1.5	1	0.5	0	0.5	0	0.5	5
North Carolina	1.5	2	1	0	0	0.5	0	0	5
Arizona	1	1	1	0.5	0	0.5	0	0.5	4.5
Georgia	1.5	2	1	0	0	0	0	0	4.5
Maine	1	1	0.5	1	0.5	0	0	0.5	4.5
New Mexico	2	2	0	0	0	0.5	0	0	4.5
Iowa	2	1.5	0	0	0	0.5	0	0	4
Missouri	1	1	1	1	0	0	0	0	4
West Virginia	1	2	1	0	0	0	0	0	4
Kansas	1	1	0	0.5	0.5	0.5	0	0	3.5
Ohio	1.5	1.5	0	0	0	0.5	0	0	3.5
South Dakota	1.5	1.5	0	0	0.5	0	0	0	3.5
Tennessee	1	1.5	1	0	0	0	0	0	3.5

State	Residential code stringency (2 pts.)	Commercial code stringency (2 pts.)	Compliance study (1 pt.)	Additional compliance activities (1 pt.)	Benchmarking and transparency (1 pt.)	Energy rating and labeling of homes (0.5 pts.)	Existing building standards (1 pt.)	Zero-energy buildings (0.5 pts.)	Total score (9 pts.)
Arkansas	1	1	1	0	0	0	0	0	3
Indiana	1.5	1	0	0	0	0.5	0	0	3
North Dakota	1.5	1.5	0	0	0	0	0	0	3
Wisconsin	1	2	0	0	0	0	0	0	3
South Carolina	1	1	0	0	0	0.5	0	0	2.5
Louisiana	1	1	0	0	0	0	0	0	2
Alaska	1	0	0	0	0.5	0	0	0	1.5
Oklahoma	1	0	0	0	0	0.5	0	0	1.5
Mississippi	0	0	0	0.5	0	0	0	0	0.5
Wyoming	0	0	0	0	0	0	0	0	0

Sources: Stringency scores are derived from data request responses (Appendix A), New Buildings Institute analysis of PNNL data, and discussions with code experts as of August 2020. Compliance and enforcement scores are based on information gathered in surveys of state building energy code contacts. See the ACEEE State and Local Policy Database for more information on state codes and compliance (ACEEE 2020b).

DISCUSSION

Stringency

We assigned each state 0 to 2 points for residential building energy codes and another 0 to 2 points for commercial building energy codes, with 2 being assigned to those with the lowest (i.e., most efficient) scores as measured by NBI's zEPI scale. We grouped the zEPI code impact scores into awarded point values generally according to their alignment with similar corresponding model codes.[53] For detailed information on building code stringency in each state, visit ACEEE's State and Local Policy Database. The zEPI Jurisdictional Score uses data from PNNL, calculating expected energy use intensity in kBtus per square foot by accounting for building type and distribution and regional climate zones for each state.[54] The zEPI scale sets the zero value at zero energy consumption, with a baseline roughly equivalent to the average building in the year 2000. Minor credits are awarded for stretch code adoption in local jurisdictions, which has the effect of improving the overall performance level of mandatory energy code adoptions within a state base.

Table 25 summarizes our scoring methodology for code stringency. Lower zEPI scores indicate lower projected energy use intensity owing to more stringent building energy codes. Residential zEPI scores between 49.1 and 57.2 earned the maximum of 2 points; these generally correspond with states that have adopted codes aligned with the 2015 or 2018 IECC. Scores between 57.3 and 66.0 earned 1.5 points, generally reflecting states that have adopted the 2012 IECC. Scores between 66.1 and 73.0 earned 1 point and align roughly with those states that have adopted codes matching the 2009 IECC. We applied a similar approach to point distributions for commercial buildings. However, state-specific amendments strengthening or weakening certain sections of a code—such as adjusting the number of air changes allowed per hour, or altering the amount of insulation required—can positively or negatively impact a state's zEPI value, and in turn its score.

Some home-rule states that have no mandatory state code and adopt building energy codes at the local level lacked sufficient data to allow calculation of a zEPI value.[55] These states could still earn points if they demonstrated a significant percentage of local adoption of a particular code, though the score assigned is a half-point less compared to that awarded for statewide adoption of a given code. Within Arizona, for example, more than 60% of new construction occurs in jurisdictions that have enacted the 2012 IECC or better, according to

[53] We have not developed a 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. We recognize that our methodology is imperfect, and we do not intend to dismiss this local progress by assigning a lower score to these states.

[54] PNNL conducts state-level technical analysis based on a methodology established by DOE. PNNL reviews state energy codes based on the IECC and 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 EUI 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.

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

SWEEP. For detailed information on building code stringency in each state, visit ACEEE's State and Local Policy Database.

Table 25. Scoring of state residential and commercial building energy code stringency

Residential zEPI score	Score (2 pts.)	Commercial zEPI score	Score (2 pts.)
49.1–57.2	2	48.0–55.7	2
57.3–66.0 or adoption of 2015/2018 IECC in major jurisdictions	1.5	55.8–65.6 or adoption of 2015/2018 IECC or ASHRAE 90.1-2013/2016 in major jurisdictions	1.5
66.1–73.0 or adoption of 2012 IECC in major jurisdictions	1	65.7–70.0 or adoption of 2012 IECC or ASHRAE 90.1-2010 in major jurisdictions	1
Adoption of 2009 IECC or equivalent in major jurisdictions	0.5	Adoption of 2009 IECC or ASHRAE 90.1-2007 in major jurisdictions	0.5

Table 26 shows state-by-state scores for this category. We should note that some states have adopted more efficient codes in recent months, too late to have new zEPI scores calculated in time for *Scorecard* publication. We note these states with an asterisk and award them points based on the anticipated zEPI score generally corresponding with the adopted title code.

Table 26. State scores for code stringency

State	zEPI score	Score	Residential code	State	zEPI score	Score	Commercial code
CA	Custom	2	*2019 Building Energy Efficiency Standards**	CA	Custom	2	*2019 Building Energy Efficiency Standards**
DC		2	*2015 IECC**	DC		2	*2015 IECC and ASHRAE 90.1 2013**
DE		2	*2018 IECC**	DE		2	*2018 IECC and ASHRAE 90.1 2016**
NE		2	*2018 IECC**	NE		2	*2018 IECC and 90.1-2016*
NM		2	*IECC 2018 with amendments**	NM		2	*2018 IECC and 90.1-2016^**
VT		2	*2018 IECC**	VT		2	*2018 IECC and ASHRAE 90.1 2016**
WA	Custom	2	*2018 WA State Energy Code (exceeds 2018 IECC)**	WA	Custom	2	*2015 WA State Energy Code (ASHRAE 90.1-2016)**
MN	49.1	2	IECC 2012 with amendments	NJ	48.0	2	90.1-2016
NY	49.7	2	IECC 2018 with amendments	MA	48.0	2	2015 IECC and 90.1-2013^
MA	49.8	2	IECC 2015 with amendments	IL	49.3	2	2018 IECC and 90.1-2016
MI	50.3	2	IECC 2015 with amendments	MD	49.5	2	2018 IECC and 90.1-2016
MD	52.6	2	IECC 2018 with amendments	PA	49.5	2	2015 IECC and 90.1-2013
NV	53.6	2	IECC 2018 with amendments	MI	49.5	2	2015 IECC and 90.1.2013^
CT	53.7	2	IECC 2015 with amendments	NY	50.2	2	2018 IECC and 90.1-2016^
IA	54.2	2	IECC 2012 with amendments	CT	50.3	2	2015 IECC and 90.1-2013
MT	54.4	2	IECC 2012 with amendments	NH	50.7	2	2015 IECC and 90.1-2013
IL	54.4	2	IECC 2018 with amendments	TX	51.0	2	2015 IECC and 90.1-2013
OR	55.0	2	IECC 2018 with amendments	AL	51.5	2	90.1-2013
PA	56.8	2	IECC 2015 with amendments	GA	51.8	2	2015 IECC and 90.1-2013^
TX	57.1	2	IECC 2015	OR	51.8	2	90.1-2016
AL	57.5	1.5	IECC 2015 with amendments	UT	51.8	2	2018 IECC and 90.1-2016
IN	58.6	1.5	IECC 2018 with amendments	ID	52.5	2	2015 IECC and 90.1-2013
GA	58.7	1.5	IECC 2015 with amendments	FL	52.5	2	2015 IECC and 90.1-2013^
OH	59.7	1.5	IECC 2018 with amendments	MN	52.5	2	2018 IECC and 90.1-2016^
NC	60.0	1.5	IECC 2015 with amendments	RI	52.5	2	2015 IECC^
NJ	60.9	1.5	IECC 2018 with amendments	VA	52.5	2	2015 IECC and 90.1-2013
VA	61.0	1.5	IECC 2015 with amendments	WI	52.5	2	2015 IECC and 90.1-2013^
NH	61.8	1.5	IECC 2015 with amendments	NV	53.0	2	Significant local adoption of 2018 IECC
FL	62.6	1.5	IECC 2015 with amendments	WV	54.5	2	90.1-2010
ID	63.3	1.5	IECC 2012 with amendments	NC	54.8	2	2015 IECC and 90.1-2013^
UT	63.6	1.5	IECC 2015 with amendments	KY	60.8	1.5	2012 IECC and 90.1-2010
RI	65.8	1.5	IECC 2015 with amendments	IA	61.2	1.5	2012 IECC and 90.1-2010
ME	66.4	1	IECC 2009	OH	63.0	1.5	2012 IECC and 90.1-2010
WI	66.5	1	IECC 2009 with amendments	MT	64.2	1.5	2012 IECC and 90.1-2010
OK	66.8	1	IECC 2009 with amendments	IN	69.0	1	90.1-2007
KY	67.4	1	IECC 2009	ME	69.0	1	2009 IECC and 90.1-2007
WV	67.9	1	IECC 2009	LA	69.4	1	90.1-2007
SC	68.6	1	IECC 2009	AR	69.8	1	2009 IECC and 90.1-2007
LA	68.9	1	IECC 2009	SC	69.8	1	2009 IECC and 90.1-2007
AR	72.3	1	IECC 2009 with amendments	OK	79.1	0	2006 IECC and 90.1-2004
HI	Home Rule	2	2015 IECC	HI	Home Rule	2	2015 IECC
CO	Home Rule	1.5	Significant adoption of 2015/2018 IECC	CO	Home Rule	1.5	Significant local adoption of 2012/2015 IECC
ND	Home Rule	1.5	Significant local adoption of 2015 IECC	ND	Home Rule	1.5	Significant local adoption of 2015 IECC
SD	Home Rule	1.5	Significant local adoption of 2015 IECC	SD	Home Rule	1.5	Significant local adoption of 2015 IECC
AK		1	Most new construction follows 2012 IECC	TN		1.5	Significant local adoption of 2012/2015 IECC
AZ	Home Rule	1	Significant local adoption of 2012 IECC	AZ	Home Rule	1	Significant local adoption of the 2012 IECC
KS	Home Rule	1	Significant adoption of 2009/2012 IECC	KS	Home Rule	1	Significant adoption of 2009/2012 IECC
MO	Home Rule	1	Significant adoption of 2009/2012 IECC	MO	Home Rule	1	Significant adoption of 2009/2012 IECC
TN		1	Significant adoption of 2009 IECC or above	AK		0	No mandatory code
MS	Home Rule	0	None statewide	MS		0	None statewide
WY	Home Rule	0	No mandatory code	WY	Home Rule	0	Significant adoption of IECC 2006 or equivalent

* These states have signed or passed legislation requiring compliance with a new iteration of codes effective by October 1, 2020, but zEPI calculations had not yet been made available when this *Scorecard* was being prepared. We award these states full credit commensurate with the average zEPI score of states that enforce a similar title code. ^ When an amendment's impact on energy efficiency could be quantified using DOE Prototype Building Models, this was captured in the analysis.

Some states regularly adopt the latest iterations of the IECC and ASHRAE 90.1 code standards as they are determined. However, other states have recently considered statutory or regulatory requirements to extend code adoption cycles. States unable to adopt the latest building energy codes will miss out on significant energy savings opportunities. ACEEE considered removing points from states with extended code adoption cycles, but most states do not actually update building codes every three years (Athalye et al. 2016). We therefore decided not to penalize those with extended cycles.

The *2019 State Scorecard* highlighted a variety of states that had recently updated to the 2018 IECC, including Nebraska, Ohio, Maryland, Illinois, and Massachusetts. Since then, a number of states have joined them in adopting the new codes, including Delaware, New Mexico, Vermont, New York, and New Jersey. While 10 states lack mandatory statewide energy codes for new residential and/or commercial construction (Alaska, Arizona, Colorado, Kansas, Mississippi, Missouri, Nevada, North Dakota, South Dakota, and Wyoming), some of these home-rule states are nonetheless showing high rates of adoption at the jurisdictional level. We awarded points to these states accordingly.

Compliance

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 tangible improvements in energy savings.

In 2015 we updated our scoring methodology to award more credit to states that had completed compliance studies in recent years. The reasoning was that, as the 2017 deadline under the American Recovery and Reinvestment Act (ARRA) approached for states to demonstrate 90% compliance with 2009 IECC and ASHRAE 90.1-2007 codes, compliance rates should reflect a state's code enforcement efforts. Although we have used the same methodology this year, ACEEE will continue to revisit this metric to determine how it might be improved to equitably score states on the basis of actual levels of compliance reported. For more information on state compliance efforts, visit ACEEE's State and Local Policy Database (ACEEE 2020b).

Table 27 shows our scoring methodology for assessing state compliance studies.

Table 27. Scoring of state efforts to assess compliance

Compliance study	Score (1 pt.)
Compliance study has been completed in the past five years, follows standardized protocols, and includes a statistically significant sample.	1
Compliance study has been completed in the past five years but does not follow standardized protocols or is not statistically significant.	0.5
No compliance study has been completed in the past five years.	0

Table 28 shows our scoring methodology for additional activities to improve and enforce energy code compliance. A state could earn 0.5 points for each compliance strategy it engaged in during the past year, up to a total of 1 point.

Table 28. Scoring of efforts to improve and enforce code compliance

Additional metrics for state compliance efforts	Score (1 pt.)
Stakeholder advisory group or compliance collaborative	0.5
Utility involvement	0.5

Several states have completed compliance studies demonstrating 90% or higher compliance rates for residential and/or commercial buildings. It could well be argued that states demonstrating compliance rates approaching 100% should receive full credit within the above metrics regardless of whether they engage in additional strategies to enforce compliance. However, we believe the current methodology is valid in the near term for several reasons. First, while we plan to award more points in the future to states on the basis of their compliance studies' results, we also want to recognize the enormous value in a state's maintaining a robust policy framework. Such a framework can support ongoing efforts to provide training and education to staff, actively monitor code changes, and make up-to-date information available to stakeholders through strong coordination. Second, we want to avoid inadvertently penalizing states with lower compliance rates under newer or more stringent codes; this would work against the *Scorecard*'s goal of rewarding states operating at the leading edge of energy efficiency.

As we look ahead to future *Scorecard*s, we plan to address these important methodological questions as well as others—including how best to compare the results of compliance studies conducted using differing methodologies (e.g., prescriptive versus performance-based) and how to update our data request accordingly.

Table 29 shows how states scored for each compliance metric. Details on state activities in these areas are given in the ACEEE State and Local Policy Database (ACEEE 2020b).

Table 29. State scores for energy code compliance efforts

State	Compliance study (1 pt.)	Stakeholder group (0.5 pts.)	Utility involvement (0.5 pts.)	Total score (2 pts.)
California	●	●	●	2
Connecticut	●	●	●	2
Massachusetts	●	●	●	2
Oregon	●	●	●	2
Pennsylvania	●	●	●	2
Texas	●	●	●	2
Alabama	●	●	●	2
Colorado	●	●	●	2
District of Columbia	●	●	●	2
Florida	●	●	●	2
Hawaii	●	●	●	2
Idaho	●	●	●	2
Illinois	●	●	●	2
Michigan	●	●	●	2
Minnesota	●	●	●	2
Missouri	●	●	●	2
Montana	●	●	●	2
Nebraska	●	●	●	2
New Jersey	●	●	●	2
New York	●	●	●	2
Rhode Island	●	●	●	2
Utah	●	●	●	2
Washington	●	●	●	2
Vermont	●		●	1.5
Kentucky	●	●		1.5
Maryland	●	●		1.5
Virginia	●	●		1.5
Arizona	●		●	1
Arkansas	●			1
Delaware		●	●	1
Georgia	●			1
Nevada	●	●		1
New Hampshire		●	●	1
North Carolina	●			1
Tennessee	●			1

State	Compliance study (1 pt.)	Stakeholder group (0.5 pts.)	Utility involvement (0.5 pts.)	Total score (2 pts.)
West Virginia	●			1
Kansas		●		0.5
Maine	○			0.5
Mississippi		●		0.5
Alaska				0
Indiana				0
Iowa				0
Louisiana				0
New Mexico				0
North Dakota				0
Ohio				0
Oklahoma				0
South Carolina				0
South Dakota				0
Wisconsin				0
Wyoming				0

An unfilled circle indicates a state receiving half credit for compliance studies, meaning that the compliance study either does not follow the PNNL methodology or does not use a significant sample size. Data are from state responses to data requests (see Appendix A). See State and Local Policy Database (ACEEE 2020c) for more details on each activity.

While 13 states scored zero, according to our survey results, almost every state in the country makes some effort to support code compliance, whether a statewide code is mandatory or not, usually by sponsoring or supporting training resources for local code officials. Nearly every state that responded uses at least one of the strategies for boosting compliance discussed above, and a growing number use many or all of them. For states that did not respond or provided partial responses to this year's survey, we referred to last year's data to complement information in some cases. States that received zero points for compliance are those that did not respond to our survey or could not report compliance activities.

Benchmarking and Energy Transparency Requirements

States with mandatory energy use benchmarking and transparency laws received 0.5 points for a policy covering either commercial or residential buildings. States with those policies in place for some or all of their commercial *and* residential buildings received 1 point. Table 30 presents states' disclosure policies.

Table 30. State benchmarking and energy transparency policies

State	Disclosure type	Building energy use transparency requirements	Score (1 pt.)
California	Commercial, residential multifamily	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.	1
District of Columbia	Commercial, residential multifamily	The Clean and Affordable Energy Act of 2008 requires privately owned commercial 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.	1
Alaska	Residential	Alaska statute AS.34.70.101 requires the release of utility data for residential buildings at the time of sale.	0.5
Hawaii	Residential	§508D-10.5 requires residential property owners to disclose energy efficiency consumer information at the time of sale or lease.	0.5
Kansas	Residential	HB 2036 requires builders or sellers of new residential single-family homes or multifamily buildings of four units or fewer to disclose information regarding the energy efficiency of the structure to prospective buyers prior to the signing of a purchase contract.	0.5
Maine	Residential rental	HP 1468 requires the disclosure of an energy efficiency checklist upon request by tenant or lessee and allows for the release of audit information on residential rental properties, both at the time of rental.	0.5
New Jersey	Commercial	AB A3723 (2018) establishes that within five years of enactment, the owner or operator of any commercial building larger than 25,000 square feet must benchmark energy and water use with the ENERGY STAR Portfolio Manager tool.	0.5
New York	Residential	Since 1981, the Truth in Heating law has required the release of residential buildings' utility data upon request by prospective purchasers at the time of sale.	0.5
South Dakota	Residential	SB 64 (2009) established certain energy efficiency disclosure requirements for new residential buildings at the time of sale.	0.5
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.

Several states have taken the lead in requiring benchmarking and energy use transparency. The most recent is New Jersey, which passed significant renewable energy legislation in

2018 that included requirements for the owners of commercial buildings larger than 25,000 square feet to benchmark energy and water use using the ENERGY STAR Portfolio Manager tool. The District of Columbia and California are the only jurisdictions we surveyed that have such requirements for both the commercial and residential multifamily sectors. As benchmarking and energy use transparency policies become more common, more states will probably expand their scope to target more buildings across both markets. However, local jurisdictions are more likely to pursue these policies. Most recently, Kansas City and St. Louis, Missouri; Portland, Oregon; and Reno, Nevada, adopted benchmarking ordinances.[56]

Residential Energy Labeling

Last year we added a new 0.5-point metric to recognize state efforts to make visible the energy consumption and efficiency of homes through issuance or support of residential energy labeling initiatives. While the benchmarking metric is based on the existence of a state policy, the labeling metric is a quantitative measure of how many homes are rated. As mentioned, a variety of energy rating protocols exists, with some state-specific labels having been uniquely adapted from DOE's Home Energy Score. In order to compare states, we used publicly available 2019 RESNET HERS ratings figures as a foundational data set and supplemented it with additional state-provided labeling records gathered through ACEEE's data request to state energy offices (RESNET 2020). We then calculated the number of ratings issued as a percentage of total building permits for residential and multifamily new construction as reported by the U.S. Census Bureau. We awarded 0.5 points to states in which this percentage was equal to or higher than the median of all states. Table 31 shows the results of this analysis.

Table 31. Residential energy labeling efforts (2019)

State	Home energy ratings issued*	New residential and multifamily building permits†	Home energy ratings as % of new construction	Score (0.5 pts.)‡
Oregon[1]	11,018	22,037	50.00%	0.5
Massachusetts	8,348	17,365	48.07%	0.5
Maryland	8,658	18,491	46.82%	0.5
Indiana	10,294	22,309	46.14%	0.5
Arizona	20,298	46,580	43.58%	0.5
New Mexico	2,082	5,020	41.47%	0.5
Colorado	14,385	38,633	37.24%	0.5
Nevada	7,398	20,143	36.73%	0.5
Oklahoma	4,446	12,152	36.59%	0.5
Ohio	7,609	23,047	33.02%	0.5
Rhode Island	455	1,400	32.50%	0.5

[56] For more information on how municipalities are encouraging building energy disclosure, see Ribeiro et al. (2015) and Cluett and Amann (2013).

State	Home energy ratings issued*	New residential and multifamily building permits†	Home energy ratings as % of new construction	Score (0.5 pts.)‡
Iowa	3,378	11,870	28.46%	0.5
Delaware	1,766	6,539	27.01%	0.5
South Carolina	9,412	36,034	26.12%	0.5
Minnesota	7,287	28,586	25.49%	0.5
North Carolina	16,849	71,307	23.63%	0.5
Texas	45,096	209,895	21.49%	0.5
Virginia	6,947	32,418	21.43%	0.5
Kansas	1,520	7,961	19.09%	0.5
Connecticut	1,105	5,854	18.88%	0.5
Michigan	3,665	20,600	17.79%	0.5
Pennsylvania	4,164	23,539	17.69%	0.5
Kentucky	2,005	11,811	16.98%	0.5
New Hampshire	742	4,743	15.64%	0.5
New Jersey	4,990	36,505	13.67%	0.5
Florida	21,090	154,302	13.67%	0.5
Alabama	2,331	17,748	13.13%	0
Idaho	2,121	17,716	11.97%	0
Georgia	5,988	53,823	11.13%	0
Illinois	2,275	20,524	11.08%	0
New York	4,474	45,219	9.89%	0
District of Columbia	528	5,945	8.88%	0
Wisconsin	1,466	17,480	8.39%	0
Utah	2,386	28,779	8.29%	0
Nebraska	581	8,025	7.24%	0
Vermont	126	1,801	7.00%	0
Wyoming	115	1,708	6.73%	0
Arkansas	591	12,723	4.65%	0
Hawaii	189	4,093	4.62%	0
Tennessee	1,840	41,361	4.45%	0
West Virginia	126	3,010	4.19%	0
Missouri[2]	583	17,460	3.34%	0
South Dakota	96	4,415	2.17%	0
Washington	902	48,424	1.86%	0

State	Home energy ratings issued*	New residential and multifamily building permits†	Home energy ratings as % of new construction	Score (0.5 pts.)‡
Louisiana	170	15,793	1.08%	0
California	848	110,197	0.77%	0
Maine	6	4,760	0.13%	0
Mississippi	3	6,952	0.04%	0
Montana	2	4,776	0.04%	0
Alaska[3]	0	1,680	0.00%	0
North Dakota	0	2,495	0.00%	0

* 2019 RESNET HERS ratings unless otherwise noted. † 2019 U.S. Census Bureau Building Permits Survey (Census Bureau 2020). ‡ Scores of 0.5 were awarded to states in which the number of ratings issued as a percentage of new construction was equal to or greater than the median, or 13.67%. [1] 7,800 Oregon Home Energy Scores supported by a state program and based on DOE's Home Energy Score; 3,045 Energy Trust of Oregon's Energy Performance Scores (EPS). EPS is a utility new homes program that evaluates homes built above code and offers incentives based on percentage above code as it is built. [2] Missouri Home Energy Certification takes into consideration both the HERS Index and the HES. A total of 3,247 Gold Certificates have been issued through the program. A home must achieve an 8 or greater on the HES, or a HERS Index score of 65 or lower to qualify. Figures for 2019 were not available. [3] AkWarm, the state-approved energy rating software, is used to model home energy requirements. More than 10,622 new homes have been constructed that meet or beat the applicable Alaska Building Energy Efficiency Standard. Figures for 2019 were not available.

Standards for Existing Buildings

Looking to the future, by 2050 roughly half of the nation's building stock will be buildings that are already standing today (Nadel 2019). While state policies often focus on improving new construction, states are also beginning to seek out ways to reduce energy consumption and carbon emissions in their stock of existing buildings. This is an important area of focus given that a building may be around for 30, 40, 50, or more years.

The two current examples of existing building standards are in the District of Columbia and Washington State. DC and Washington are both in the process of enacting requirements for commercial buildings 50,000 square feet and above to meet minimum performance standards. The standards require buildings to meet a minimum threshold—energy use intensity in Washington state and ENERGY STAR score (which is based on EUI) in DC. Both standards permit alternative compliance pathways for buildings unable to meet these thresholds, allowing them to show that they are taking sufficient steps to reduce energy consumption. Table 32 gives further details.

Table 32. Existing building standards

State	Existing building standard type	Requirements	Score (1 pt.)
District of Columbia	Commercial	The District's December 2018 Clean Energy DC Omnibus Act includes a provision to create Building Energy Performance Standards (BEPS). BEPS will require all existing buildings over 50,000 square feet to meet an energy efficiency threshold or to improve its performance by 2026. The threshold is based on an ENERGY STAR score. Alternative pathways will be available for buildings unable to meet the threshold.	1
Washington	Commercial	The state's 2019 House Bill 1257, Clean Buildings for Washington Act, set requirements for commercial buildings to meet performance targets. The Department of Commerce determines the targets using energy use intensity as a metric. Buildings over 50,000 square feet are required to comply, starting in 2026 with the largest buildings. An additional compliance pathway is available for buildings unable to meet the EUI, provided they have conducted an energy audit and invested in improvements.	1

Zero-Energy Building Deployment

Examples of zero-energy buildings, which generate at least as much energy as they consume (averaged out annually), keep increasing in number each year. With the growing interest in zero-energy and zero-carbon building design, we have included a new metric to account for states' commitment to developing zero-energy buildings.

The New Buildings Institute tracks verified and emerging zero-energy building projects throughout the United States. [57] For this metric, we considered verified zero energy buildings and, to a lesser degree, emerging zero-energy buildings. We then normalized the total by each state by gross domestic product, so as not to favor large states with greater ability to build ZEBs.

Our scoring results show Vermont to be the highest rated with our metric: With its relatively small economy, it has four verified zero-energy buildings and five emerging ones. By sheer numbers alone, California earns the top spot, with 50 verified ZEBs and 236 in the emerging category. Although having the largest economy of any state counterbalances these high numbers, California still ranked third on our list, showing that it has a disproportionately high number of zero-energy buildings. We awarded 0.5 points to states that achieved a ZEB per GDP ratio of 20 or above, which accounts for roughly a third of the states, as shown in Table 33.

[57] 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 2020).

Table 33. Zero-energy buildings per GDP

State	Verified ZEBs	Emerging ZEBs	State GDP (trillion dollars)	ZEBs per GDP*	Score (0.5 points)
Vermont	4	6	0.030	232.0	0.5
Oregon	5	26	0.234	77.0	0.5
Hawaii	3	5	0.083	65.9	0.5
California	50	236	2.893	58.1	0.5
District of Columbia		9	0.138	32.6	0.5
Maine	1	2	0.061	32.5	0.5
Massachusetts	7	21	0.547	32.0	0.5
Nevada	2	6	0.156	32.0	0.5
Colorado	2	17	0.365	28.8	0.5
Arizona	1	18	0.350	28.6	0.5
Utah	2	6	0.183	27.3	0.5
Kentucky	3	4	0.194	25.8	0.5
New Hampshire		4	0.079	25.4	0.5
Montana		2	0.048	21.0	0.5
North Dakota		2	0.050	20.0	0.5
Washington	7	9	0.580	19.8	0
Iowa	2	3	0.179	19.5	0
Connecticut	3	4	0.263	19.0	0
Mississippi	1	2	0.106	18.9	0
Arkansas	1	2	0.121	16.6	0
South Carolina		7	0.225	15.6	0
Wyoming		1	0.033	15.0	0
Virginia	4	7	0.520	14.4	0
Delaware	1		0.072	14.0	0
Maryland	2	7	0.399	13.8	0
Minnesota	1	7	0.348	12.9	0
Idaho	1		0.077	12.9	0
Wisconsin	1	6	0.314	12.7	0
Pennsylvania	5	8	0.724	12.4	0
Florida	7	10	1.027	11.7	0
North Carolina	4	4	0.547	11.0	0
Alaska		1	0.046	11.0	0
New Mexico		2	0.093	10.7	0

State	Verified ZEBs	Emerging ZEBs	State GDP (trillion dollars)	ZEBs per GDP*	Score (0.5 points)
Indiana	2	3	0.344	10.2	0
New York	4	24	1.588	10.1	0
Rhode Island		1	0.056	8.9	0
Nebraska		2	0.120	8.4	0
Ohio	3	4	0.626	8.0	0
West Virginia		1	0.068	7.4	0
Missouri	1	2	0.299	6.7	0
Michigan	1	4	0.475	6.3	0
Kansas		2	0.161	6.2	0
Illinois		10	0.807	6.2	0
Tennessee		4	0.333	6.0	0
Texas	3	13	1.628	5.8	0
Georgia		5	0.581	4.3	0
New Jersey	1	2	0.574	3.5	0
Alabama		1	0.210	2.4	0
Louisiana		1	0.224	2.2	0
Oklahoma			0.173	0.0	0
South Dakota			0.051	0.0	0

*Verified zero-energy buildings are given a weight of 1, while emerging zero-energy buildings are given a weight of 0.5.
Sources: NBI 2019; BEA 2020.

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, and buildings sectors discussed in previous 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.

We focus 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 removed one category, R&D for energy efficiency technologies and practices, since the vast majority of states administer or support some form of R&D program. However, we continue to collect and post this information on ACEEE's State and Local Policy Database.[58] In lieu of scoring R&D, we expanded our scoring metric for carbon pricing policies that help advance investments in efficiency, as discussed further below.

SCORING AND RESULTS

States could earn up to 6 points in this policy area for the following:

- Financial incentives offered by state agencies (2.5 points)
- Lead-by-example policies (2 points)
- Carbon pricing policy (1.5 points)

Table 34 presents the overall results of scoring on state initiatives.

Table 34. Summary of scores for government-led initiatives

State	Financial incentives (2.5 pts.)	Lead by example (2 pts.)	Carbon pricing policy (1.5 pts.)	Total score (6 pts.)
California	2.5	2	1.5	6
Connecticut	2.5	2	1.5	6
Delaware	2.5	2	1.5	6
Massachusetts	2.5	2	1.5	6
Rhode Island	2.5	2	1.5	6
Vermont	2.5	2	1.5	6
Colorado	2.5	2	1	5.5
Maine	2.5	1.5	1.5	5.5

[58] See database.aceee.org.

State	Financial incentives (2.5 pts.)	Lead by example (2 pts.)	Carbon pricing policy (1.5 pts.)	Total score (6 pts.)
Maryland	2.5	2	1	5.5
Minnesota	2.5	2	1	5.5
New Hampshire	2.5	2	1	5.5
New York	2.5	1.5	1.5	5.5
Oregon	2.5	2	1	5.5
Pennsylvania	2.5	2	0.5	5
Tennessee	2.5	2	0.5	5
Virginia	2.5	1.5	1	5
Washington	2.5	2	0.5	5
Nevada	2.5	1	1	4.5
District of Columbia	1.5	1.5	1	4
Florida	2.5	1.5	0	4
Illinois	1.5	2	0.5	4
Kentucky	2.5	1.5	0	4
Missouri	2.5	1.5	0	4
New Mexico	1.5	2	0.5	4
North Carolina	1.5	2	0.5	4
South Carolina	2.5	1.5	0	4
Wisconsin	1.5	1.5	1	4
Alaska	2.5	1	0	3.5
Arkansas	2	1.5	0	3.5
Michigan	2.5	1	0	3.5
Ohio	2.5	1	0	3.5
Texas	1.5	2	0	3.5
Utah	1.5	2	0	3.5
Alabama	1.5	1.5	0	3
Montana	1.5	1.5	0	3
New Jersey	0	2	1	3
Hawaii	0.5	1.5	0.5	2.5
Louisiana	1	1.5	0	2.5
Mississippi	1.5	1	0	2.5
Oklahoma	0.5	1.5	0.5	2.5
Wyoming	2	0.5	0	2.5

State	Financial incentives (2.5 pts.)	Lead by example (2 pts.)	Carbon pricing policy (1.5 pts.)	Total score (6 pts.)
Arizona	1	1	0	2
Georgia	0.5	1.5	0	2
Idaho	1.5	0.5	0	2
Nebraska	1.5	0.5	0	2
Indiana	1	0.5	0	1.5
West Virginia	1.5	0	0	1.5
Iowa	0.5	0.5	0	1
Kansas	0	1	0	1
North Dakota	0.5	0	0	0.5
South Dakota	0	0.5	0	0.5

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

Information regarding state incentives for energy efficiency improvements was gathered through our survey of state energy officials and our review of the Database of State Incentives for Renewables and Efficiency (DSIRE 2020).

We did not give points in this category for utilities' customer-funded financial incentive programs, which are covered in Chapter 2. Here 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 giving credit for PACE financing programs enabled by state legislation. From 2009 to 2019, energy efficiency projects accounted for 49% of commercial PACE funding (PACENation 2020a). 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.[59] 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 35 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 2.5 points for major financial incentive programs that encourage the purchase of energy-efficient products.[60] We judged these programs on their relative strength, customer reach, and impact. Incentive programs generally received 0.5 points each, but several states have major incentive programs that we deemed worth 1 point each; these include Arizona, Connecticut, Idaho, Nebraska, Nevada, New York, Texas, Washington, and Wisconsin. States that have at least one active PACE program were awarded 0.5 points. Table 35 shows our scoring of state financial incentives.

It should be noted that the number of financial incentive programs a state implements may not fully reflect the robustness of its efforts. Accordingly, this year we attempted to collect additional information from state energy offices regarding state budgets for financial incentives, program participation rates, verified savings from incentives, and leveraging of private capital. These data are presented in Appendix L.

[59] Currently, 37 states plus Washington, DC, authorize PACE (PACENation 2020b). While most states' PACE activity is in the commercial market, residential PACE is currently offered in California, Florida, and Missouri.

[60] 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 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, they are not credited at this time.

Table 35. State scores for major financial incentive programs

State	Major state financial incentives for energy efficiency	Score (2.5 pts.)
Alaska	Five loan programs; one grant program	2.5
California	California Infrastructure and Economic Development Bank–led bond program for public buildings; three 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	2.5
Colorado	Loan loss reserve program; school loan program; Residential Energy Upgrade (RENU) Loan program; Agricultural Energy Efficiency Program; statewide commercial PACE financing	2.5
Connecticut	Connecticut Green Bank–led programs including three loans, three financing options for multifamily and low-to-moderate-income residential projects, commercial PACE financing; one loan for multifamily housing properties; two loans for multifamily and low-income residential projects	2.5
Delaware	Three loan programs; three grant programs; two rebate programs	2.5
Florida	Efficiency and Renewable Improvements in Commercial Aquaculture (ERICA); Rural Community Energy Efficiency Grant Program (RCEE); Renewable Energy and Energy-Efficient Technologies (REET) Grant Matching Program; RESTORE Act; commercial and residential PACE financing	2.5
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	2.5
Maine	Residential rebate and incentive; consumer products incentive; commercial and industrial incentive; heat pump incentive; weatherization program	2.5
Maryland	Loans and grant programs for agricultural, residential, multifamily, commercial, and industrial sectors; Smart Energy Communities program; loans for state agencies; commercial PACE financing	2.5
Massachusetts	Alternative Energy and Energy Conservation Patent Exemption (personal and corporate); one bond; several grants	2.5
Michigan	Three loans; two rebates; several grants; commercial PACE financing	2.5
Minnesota	Four loans; three revolving loans; one loan loss reserve; commercial PACE financing	2.5
Missouri	One loan program; one loan loss reserve; one revolving loan; one personal tax deduction; commercial and residential PACE financing	2.5
Nevada	Property tax abatement for green buildings; Home Energy Retrofit Opportunities for Seniors (HEROS); loans for state employees; commercial PACE financing	2.5
New Hampshire	Four revolving loan funds; one grant; commercial PACE financing	2.5
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	2.5

State	Major state financial incentives for energy efficiency	Score (2.5 pts.)
Ohio	Two loans; one grant program; property tax exemption for energy-efficient projects; commercial PACE financing	2.5
Oregon	Three grant programs; one rebate; commercial PACE financing	2.5
Pennsylvania	Alternative Energy Investment Fund; Sustainable Energy Finance Program; several grant and loan programs; commercial PACE financing	2.5
Rhode Island	Rhode Island Infrastructure Bank–led programs, including one revolving loan program and commercial PACE financing; two grants; two rebates	2.5
South Carolina	Tax credits and sales tax cap for new energy-efficient manufactured homes; two loan programs; mini-grants	2.5
Tennessee	Energy Efficient Schools Initiative (loans and grants); two grant programs; one loan program	2.5
Vermont	Three Sustainable Energy Loan Fund programs; Energy Loan Guarantee Program; Weatherization Trust Fund; Heat Saver Loan	2.5
Virginia	Energy Leasing Program for state-owned facilities; Clean Energy Manufacturing Incentive Grant Program; one loan program; personal tax incentive; financing for innovative energy technologies; commercial PACE financing	2.5
Washington	Major grant program for energy efficiency in public facilities and local communities; several loans and grants	2.5
Arkansas	Three loans; commercial PACE financing	2
Wyoming	Three grant programs; one loan program	2
Alabama	Alabama SAVES revolving loan program; AlabamaWISE Home Energy Program (loans); EE Retrofit program	1.5
District of Columbia	Green Light Grant Program; commercial PACE financing; DC Green Bank	1.5
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	1.5
Illinois	Renewable Energy and Energy Efficiency Project Financing; Green Energy Loan program; commercial PACE financing	1.5
Mississippi	One loan program; one public sector lease program for energy-efficient equipment; one private-sector grant for industrial energy efficiency	1.5
Montana	Energy conservation installation tax credit; tax deduction for energy-conserving investment; Alternative Energy Revolving Loan Program	1.5
Nebraska	Major loan program (Dollar and Energy Saving Loans); commercial PACE financing	1.5
New Mexico	Sustainable Building Tax Credit (corporate and personal); bond program	1.5
North Carolina	One loan program; one cost savings program; PACE financing	1.5
Texas	Major loan program (Texas LoanSTAR); commercial PACE financing	1.5

State	Major state financial incentives for energy efficiency	Score (2.5 pts.)
Utah	Two loan programs for state-owned buildings and schools; commercial PACE financing	1.5
West Virginia	West Virginia Division of Energy and WVU College of Engineering partnership; EE West Virginia; one revolving loan fund	1.5
Wisconsin	Major loan program (Clean Energy Manufacturing Revolving Loan Fund); commercial PACE financing	1.5
Arizona	Property tax exemption for energy-efficient building components and CHP	1
Indiana	Tax credit for purchase and installation of residential insulation; Green Project Reserve revolving loan fund	1
Louisiana	Home Energy Loan Program (HELP); Energy Fund Loan Program	1
Georgia	One grant program	0.5
Hawaii	Green Energy Market Securitization (GEMS) financing program	0.5
Iowa	Energy Bank Revolving Loan Program	0.5
North Dakota	Energy Conservation Grant	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.[61] 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).

Because most state green banks are in the early planning stages and have yet to reach full scale, there is a lack of data on their performance (Gilleo, Stickles, and Kramer 2016). 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:

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

- *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

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. As of the end of May 2020, the state's CAAs reported that 1,098 households had expressed an interest in or were on wait lists for heat pumps. So far, CAAs have managed the installation of 175 heat pumps at a cost of $563,321.

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. In 2020 NYGB reported that $117.5 million of capital had been committed in the fourth quarter of 2019, making 2019 its best-performing year to date with $276.1 million allocated. 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.[62]

States can show leadership in energy efficiency policy through the development of state energy plans, and in fact most states have them.[63] Governors can issue executive orders or form planning committees to evaluate state energy needs, goals, and opportunities.[64] 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 2 points in this category: 0.5 points each for energy savings targets in new and existing state buildings, benchmarking requirements for public facilities, energy savings performance contract (ESPC) activities, and fleet fuel efficiency mandates. 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, the energy costs of which 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 not yet implemented 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.

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

[62] 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.

[63] See naseo.org/stateenergyplans.

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

require state buildings to exceed the statewide energy code or meet a green building criterion like Leadership in Energy and Environmental Design (LEED) certification.

Benchmarking requirements for public buildings. Proper building energy management is a critical element of successful energy efficiency initiatives in the public sector. Benchmarking energy use in public sector buildings through tailored tools or widely available tools such as ENERGY STAR Portfolio Manager ensures a comprehensive set of energy consumption data that can be used to drive cost-effective energy efficiency investments.[65] Comparing building energy performance across agencies can also help prioritize energy efficiency projects.

Through benchmarking policies, states and cities require all buildings of a certain size or type to undergo a regular energy audit or have their energy performance tracked. We awarded 0.5 points for energy benchmarking policies and large-scale benchmarking programs for public sector facilities.

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 about 3,500. Operation and maintenance costs for these fleets every 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 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.

Energy savings performance contracting policies and programs. If state governments have the necessary support, leadership, and tools in place, they can help projects overcome information and cost barriers by financing energy improvements through ESPCs. The state may enter into an ESPC with an energy services company (ESCO), paying for these services

[65] Some states have their own databases of public building energy use that integrate with the ENERGY STAR Portfolio Manager. For example, Maryland's EnergyCAP database compiles the energy use (based on utility bills) of all public buildings in the state and enables comparison of buildings occupied by various state agencies.

with money saved on lower energy bills from energy conservation measures. A designated state agency may serve as the lead contact for implementing the contract.[66]

We based scores for ESPC activities on support, leadership, and tools. To promote performance contracting, states must provide an enabling framework (support) and guidance and resources (leadership and tools) to get projects underway. We awarded a state 0.5 points if it satisfied at least two of the three criteria. Table 36 describes qualifying actions.

Table 36. Scoring of ESPC policies and programs

Criterion	Qualifying action
Support	The state explicitly promotes the use of ESPCs to improve the energy efficiency of public buildings through statutory requirements, recommendations, or explicit preferences for ESPC use; executive orders that promote or require ESPCs; and/or financial incentives for agencies seeking to use ESPCs.
Leadership	A state program directly coordinates ESPCs, or a specific state agency serves as lead contact for implementing ESPCs.
Tools	The state offers documents that streamline and standardize the ESPC process, including a list of prequalified service companies, model contracts, and/or a manual that lays out the procedures required for state agencies to utilize ESPCs.

States must satisfy at least two of the three criteria above to receive credit.

Table 37 presents states' overall scores for lead-by-example efforts.

Table 37. State scores for lead-by-example initiatives

State	New and existing state building requirements	Benchmarking requirements for public buildings	Efficient fleets	ESPC policy and programs	Score (2 pts.)
California	•	•	•	•	2
Colorado	•	•	•	•	2
Connecticut	•	•	•	•	2
Delaware	•	•	•	•	2
Illinois	•	•	•	•	2
Maryland	•	•	•	•	2
Massachusetts	•	•	•	•	2
Minnesota	•	•	•	•	2
New Hampshire	•	•	•	•	2

[66] For a full discussion of ESPCs, the ESCO market, and actual implementation trends, see Stuart et al. (2016). For additional best practices in state and local establishment and implementation of ESPC programs, see DOE's ESPC Toolkit (betterbuildingssolutioncenter.energy.gov/energy-savings-performance-contracting-espc-toolkit) and its guidelines for state ESPC program development (betterbuildingssolutioncenter.energy.gov/sites/default/files/attachments/ESPC-Program_Guidelines_Final.pdf).

State	New and existing state building requirements	Benchmarking requirements for public buildings	Efficient fleets	ESPC policy and programs	Score (2 pts.)
New Jersey	•	•	•	•	2
New Mexico	•	•	•	•	2
North Carolina	•	•	•	•	2
Oregon	•	•	•	•	2
Pennsylvania	•	•	•	•	2
Rhode Island	•	•	•	•	2
Tennessee	•	•	•	•	2
Texas	•	•	•	•	2
Utah	•	•	•	•	2
Vermont	•	•	•	•	2
Washington	•	•	•	•	2
Alabama		•	•	•	1.5
Arkansas	•	•		•	1.5
District of Columbia	•	•	•		1.5
Florida		•	•	•	1.5
Georgia	•	•		•	1.5
Hawaii		•	•	•	1.5
Kentucky	•	•		•	1.5
Louisiana	•		•	•	1.5
Maine	•		•	•	1.5
Missouri	•		•	•	1.5
Montana	•	•		•	1.5
New York	•	•		•	1.5
Oklahoma	•	•		•	1.5
South Carolina	•	•		•	1.5
Virginia	•	•		•	1.5
Wisconsin	•		•	•	1.5
Alaska	•	•			1
Arizona	•			•	1
Kansas	•			•	1
Michigan		•		•	1
Mississippi		•	•		1
Nevada		•		•	1

State	New and existing state building requirements	Benchmarking requirements for public buildings	Efficient fleets	ESPC policy and programs	Score (2 pts.)
Ohio		•		•	1
Idaho				•	0.5
Indiana	•				0.5
Iowa		•			0.5
Nebraska		•			0.5
South Dakota		•			0.5
Wyoming				•	0.5
North Dakota					0
West Virginia					0

Leading and Trending States: Lead-by-Example Initiatives

New Mexico. In 2019, Governor Michelle Lujan Grisham signed Executive Order 2019-003, which commits the state to the 2015 Paris Agreement goals and to the U.S. Climate Alliance. The order also creates a New Mexico Climate Change Task Force that will work toward a statewide climate strategy. In particular, the task force will aim to reduce light-duty vehicle emissions, set emissions limits through a market-based program, adopt new building codes, identify transmission corridors to transport renewable energy, and strengthen the state's renewable portfolio and energy efficiency standards. Further, state agencies are now required to incorporate climate mitigation and adaptation strategies into their programs and implement policies to further reduce GHGs.

Connecticut. Signed by Governor Ned Lamont in 2019, Executive Order No. 1 calls for reducing energy consumption and GHG emissions from state government operations. Focusing on state buildings, a steering committee will work on onsite heating and cooling, electricity, clean energy, vehicles, waste management, water use, and product procurement to help the state achieve its GHG emissions, waste disposal, and water consumption goals. The committee will also consider how to meet a net-zero emissions target for 2050.

Oregon. Executive Order 20-04, signed by Governor Kate Brown in 2020, establishes a plan for meeting the state's climate goals by directing state agencies to put new measures into effect to lower the state's greenhouse gas emissions. The order directs the Environmental Quality Commission and Department of Environmental Quality to amend Oregon's Clean Fuel Standards to meet GHG emissions reduction goals per unit of fuel energy. Additionally, the order requires the Department of Consumer and Business Services Building Codes Division to establish energy efficiency goals for new residential and commercial construction. The Department of Administrative Services is also directed to develop a statewide electric vehicle procurement policy for state agencies. Altogether, the order aims for the state of Oregon to reduce GHG emissions by at least 45% below 1990 levels by 2035 and at least 80% below 1990 levels by 2050 (Oregon Office of the Governor 2020).

Nevada. In 2019, Governor Steve Sisolak signed Executive Order 2019-22, which directs the administration to collaborate with public, private, and tribal partners to accelerate the state's action on meeting its bold climate goals. The order directs state agencies to assess viable

policies and regulatory strategies to meet greenhouse gas reduction requirements. Moreover, the order prioritizes building energy codes to increase residential and commercial energy efficiency to achieve emissions reductions. The bill also mandates each state agency to develop priority lists for building energy efficiency projects to be shared with the administration. The administration will investigate financing opportunities for these projects, as indicated by the order (Nevada Office of the Governor 2019).

Carbon Pricing

Recent years have seen a surge in actions to strengthen GHG and renewable generation goals, including the 2019 enactment of 100% clean energy targets in five states (Nevada, New Mexico, Washington, New York, and Maine). Accordingly, last year we introduced a new metric on 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 and Kubes 2019). Two main types of pricing are generally used: 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 and Kubes 2019). For example, RGGI has dedicated to energy efficiency about 58% of the funds it has raised from cap-and-trade activity (RGGI 2018). That has resulted in decreased emissions, lower customer bills, lower wholesale power prices, new jobs, and a strengthened local economy (Hibbard et al. 2018).

This year we added two new sub-metrics. The first scores whether states or utilities track avoided greenhouse gas emissions achieved through energy efficiency programs, and the second scores whether utilities include avoided costs from emissions reductions in their cost-effectiveness screening. Both of these metrics are important in calculating impacts of efficiency programs and determining ways to increase their success.

SCORES FOR CARBON PRICING

States could earn up to 1.5 points in this category: 0.5 points for having either a carbon tax or a cap-and-trade policy in place; 0.5 points for tracking avoided greenhouse gas emissions achieved through energy efficiency programs; and 0.5 points for including avoided greenhouse gas emissions within benefit–cost testing calculations. Table 38 highlights the total scores for these metrics.

Table 38. State scores for carbon pricing metrics

State	Carbon pricing policy	GHG emissions tracking	Cost-effectiveness test inclusion	Score (1.5 pts.)
California	•	•	•	1.5
Connecticut	•	•	•	1.5
Delaware	•	•	•	1.5
Maine	•	•	•	1.5
Massachusetts	•	•	•	1.5
New York	•	•	•	1.5

State	Carbon pricing policy	GHG emissions tracking	Cost-effectiveness test inclusion	Score (1.5 pts.)
Rhode Island	•	•	•	1.5
Vermont	•	•	•	1.5
Colorado		•	•	1
District of Columbia		•	•	1
Maryland	•	•		1
Minnesota		•	•	1
Nevada		•	•	1
New Hampshire	•	•		1
New Jersey	•	•		1
Oregon		•	•	1
Virginia	•	•		1
Wisconsin		•	•	1
Hawaii		•		0.5
Illinois			•	0.5
New Mexico		•		0.5
North Carolina		•		0.5
Oklahoma		•		0.5
Pennsylvania		•		0.5
Tennessee		•		0.5
Washington			•	0.5
Alabama				0
Alaska				0
Arizona				0
Arkansas				0
Florida				0
Georgia				0
Idaho				0
Indiana				0
Iowa				0
Kansas				0
Kentucky				0
Louisiana				0
Michigan				0
Mississippi				0

State	Carbon pricing policy	GHG emissions tracking	Cost-effectiveness test inclusion	Score (1.5 pts.)
Missouri				0
Montana				0
Nebraska				0
North Dakota				0
Ohio				0
South Carolina				0
South Dakota				0
Texas				0
Utah				0
West Virginia				0
Wyoming				0

Table 39 lists state and utility efforts to track avoided emissions resulting from efficiency programs as described in responses to the *2020 State Scorecard* data request to state energy officials and utility regulators.

Table 39. State and utility responses on avoided emissions tracking

State	Response on GHG tracking
California	The California Air Resources Board, California Public Utilities Commission, and California Energy Commission all track avoided GHG emissions achieved through energy efficiency programs.
Colorado	Colorado reports GHG emissions reductions as a result of energy efficiency programs in its DSM annual report.
Delaware	Avoided GHG emissions are reported to RGGI for all programs funded by RGGI proceeds. In keeping with the state's EM&V regulations, program administrators file reports with the Energy Efficiency Advisory Council on energy impact information for each program; these data are used to calculate avoided greenhouse gas emissions achieved through the programs.
District of Columbia	The DC Sustainable Energy Utility tracks avoided GHG emissions associated with electric and natural gas efficiency programs, assigning a general CO_2 amount associated with each kWh and MMBtu avoided.
Hawaii	Hawaii Energy tracks GHG emissions (pre-PY19) and set targets for PY19-PY21.
Maine	The Efficiency Maine Trust reports on GHG emissions achieved through RGGI-funded energy efficiency programs through the annual "Investment of RGGI Proceeds" report to RGGI, Inc. and the RGGI Annual Report to the Maine State Legislature.

State	Response on GHG tracking
Maryland	Maryland's Greenhouse Gas Reduction Act requires the development of a GHG reduction plan and established a Maryland Climate Change Commission to help with the development of the plan. For this effort, GHG reductions are tracked economy wide, thus reflecting the results of energy efficiency and renewable energy efforts, as well as nonenergy benefits. Some reports by the EmPOWER utilities include information about GHG reductions resulting from energy efficiency programs, but reporting is not required.
Massachusetts	Most of the state's efficiency programs track avoided emissions. Some state programs (e.g., grants for training and market development) do not track avoided emissions because they address overcoming market barriers at various stages of the energy efficiency life-cycle rather than achieving direct savings.
Minnesota	The Department of Commerce publishes an annual report on the energy savings and estimated carbon dioxide reductions achieved by energy conservation improvement programs for the two most recent years for which data are available.
Nevada	Nevada reports GHG emissions reductions as a result of energy efficiency programs in its DSM annual report.
New Hampshire	The utilities typically quantify the amount of GHG reductions in their plans and quarterly updates.
New Jersey	The state requires that utilities filing energy efficiency and peak demand programs for the next generation of energy efficiency programming in New Jersey include emissions savings as a part of the minimum filing requirements. Emissions savings must be tracked and reported and will be evaluated through the evaluation, measurement, and verification process. The state will also track and report GHG emissions, among other metrics.
New Mexico	The state tracks emissions reductions for all of its programs and reports them as part of the ACEEE data request.
New York	NYSERDA and the utilities track and report avoided GHG emissions through energy efficiency programs, and results are publicly available through the Clean Energy Dashboard.
North Carolina	The NC Division of Air Quality produces an annual report that quantifies reductions in GHG from avoided generation due to energy efficiency and other non-emitting power sources that receive credits under the NC Renewable Energy and Energy Efficiency Portfolio Standard.
Oklahoma	Both Public Service Company of Oklahoma and Oklahoma Gas and Electric track avoided greenhouse gas emissions, specifically tons of CO_2e emissions savings.
Oregon	The state tracks avoided GHGs from many energy efficiency programs but does not publish the information. The state tracks and publishes GHG data of electric utilities to assist customers in understanding the impact of their electricity use. Energy Trust tracks avoided carbon emissions within its service territory.
Pennsylvania	A centralized greenhouse gas emissions tracking system does not exist for all the programs with state funding since some of the programs are housed in other agencies. However, the Pennsylvania Energy Programs Office does track emissions through its various programs. The state's Climate Action Plan and Greenhouse Gas Inventory, as required by PA Act 70 of 2008, tracks statewide emissions trends.

State	Response on GHG tracking
Rhode Island	The utility tracks avoided greenhouse gas emissions and reports that as part of its annual energy efficiency programs. Specifically, the utility projects values in its annual planning process and reports on the actuals in its year-end reports. In addition, GHG reductions from the state's EE programs are included in the statewide GHG inventories.
Tennessee	The state's Office of Energy Programs estimates CO_2 emissions avoided by state-led energy efficiency programs, including EmPower Tennessee, Energy Efficient Schools Initiative, and Pathway Energy Efficiency and Renewable Energy Loan Program.
Vermont	The state tracks avoided emissions for its energy efficiency programs as well as for Renewable Energy Standard Tier 3 programs. The information is included in the energy efficiency utility and distribution utility Tier 3 annual reports.
Virginia	The Department of Mines, Minerals, and Energy provides data on energy efficiency program savings to the Department of Environmental Quality, which tracks total GHG emissions and emissions reduction initiatives through CDP (formerly Carbon Disclosure Project).
Wisconsin	Focus on Energy tracks carbon dioxide reductions achieved through energy efficiency programs.

Leading and Trending States: Carbon Pricing Policies

Virginia. In early March 2020, a bill called the Virginia Clean Economy Act was signed by Governor Ralph Northam. The legislation encourages the state to implement a carbon dioxide cap-and-trade program that applies to electric generation facilities and complies with the Regional Greenhouse Gas Initiative (RGGI). The act also requires the Virginia Corporation Commission to receive a report from the Air Pollution Control Board before approval of "any investor-owned utility to own, operate, or construct any electric generating unit that emits carbon as a by-product of combusting fuel to generate electricity." It also mandates the commission and utilities to account for the social cost of carbon when assessing the need for new electric generating facilities (Virginia General Assembly 2020).

New Jersey. In June 2019 the New Jersey Department of Environmental Protection approved two rules that authorized the state to rejoin the Regional Greenhouse Gas Initiative. One of them, the Carbon Dioxide Trading rule, established a carbon dioxide cap for the state's electricity generation sector at 18 million tons in 2020. New Jersey's carbon dioxide budget will decrease 30% by 2030. The state rejoined RGGI after being withdrawn by former governor Chris Christie in 2012. New Jersey's move to rejoin RGGI is an important step for the state to meet its goal of 100% clean energy by 2050 (New Jersey Office of the Governor 2019).

Pennsylvania. In November 2019 Governor Tom Wolf signed Executive Order 2019-07, which directed the Pennsylvania Department of Environmental Protection (DEP) to enter the Regional Greenhouse Gas Initiative. The order requires the DEP to develop a proposed rulemaking package to mitigate carbon dioxide emissions from electric power generators and to present the package to the Pennsylvania Environmental Quality Board. The proposed rulemaking must incorporate thorough public outreach to ensure the program results in decreased GHG emissions, increased economic productivity, and reduced costs for the consumer. The DEP is also directed to work with PJM, the regional transmission organization, to ensure the

integration of this program results in competitive economic dispatch and reduced emissions discharge (Pennsylvania Office of the Governor 2019).

Energy Efficiency Programs for Low-Income Households

As discussed in Chapter 2, low-income households often face a disproportionate energy burden that can be alleviated by energy efficiency (Drehobl and Ross 2016). Reducing energy burdens for low-income households not only keeps money in these families' pockets but also improves their quality of life by creating healthier homes and neighborhoods. These efforts can help states address other priorities such as reduced emissions, economic development, and improved public health.

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. They can 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, although in practice these often use other resources as well, since nonutility weatherization funding can be used to leverage ratepayer funds, and vice versa.

State energy offices, state housing agencies, and partner agencies have many options for investing in energy efficiency in under-resourced communities. These options include:

- Designing energy efficiency programs or incentives specifically for low-income households and investing state resources alongside federal and ratepayer dollars;
- Leveraging existing Weatherization Assistance Program delivery channels to expand energy efficiency offerings to program participants;
- Providing technical assistance and financial resources to public housing authorities as they work with ESCOs to improve their properties;
- Encouraging agencies and organizations allocating federal grants to income-qualified recipients, such as the Low-Income Housing Tax Credit, to prioritize energy efficiency in their allocation process.

States can also address low-income equity and workforce development needs through state energy plans and electrification strategies. As states move toward policies and programs to meet more ambitious GHG reduction targets by switching end uses to electricity, there is also an interest in making sure these fuel-switching efforts are in fact beneficial—i.e., that they save customers money and reduce environmental impacts. It is also important that electrification strategies be inclusive of low-income households, which may face unique barriers such as high up-front costs or lack of access to new electric technologies and appliances. Meanwhile, equitable workforce development extends benefits from these programs to underserved community members while achieving a strong, capable workforce that can impact the scale and quality of implementation (Shoemaker and Ribeiro 2018). Opportunities include:

- **Offering enhanced fuel-switching incentives for low-income customers.** The Colorado WAP is running a pilot program to install air source heat pumps, which will support building electrification for homeowners, both now through direct install and in the future once its impacts are better understood. In Maine, low-income customers qualify for a higher heat pump rebate under the Affordable Heat Initiative than the standard Home Energy Savings Program rebate (Efficiency Maine Trust 2020).
- **Developing equity-related metrics and reporting frameworks.** The Oregon PUC applies annual "diversity, equity, and inclusion" performance metrics to Energy Trust, including items such as "Complete 1,000 projects with trade allies that are minority-owned businesses" and "Implement a rural-focused workshop." These metrics are revisited every year.
- **Establishing stakeholder processes to better understand low-income sector needs.** Iowa's Energy Workforce Consortium brings industry experts, state agencies, and community colleges together to discuss and collaborate on the changing workforce and the needs of the energy industry.
- **Working with state and local colleges to provide training and technical resources, incentives for LMI communities and displaced workers, and incentives for using certain labor standards.** New Mexico's 2019 Energy Transition Act creates three new funds to provide transition assistance to tribal communities, displaced workers, and communities affected by coal plant closures. The state of Washington's Clean Energy Transformation Act includes incentives for workforce development in the form of a tax credit for using certain labor standards.

Through ongoing research and outreach, ACEEE is working to help states and utilities identify the challenges and opportunities in delivering energy efficiency to the low-income market. For more information and examples of supportive policies, please visit ACEEE's State and Local Policy Database.[67]

[67] See database.aceee.org/state/equity-workforce.

Chapter 6. Appliance and Equipment Efficiency Standards

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INTRODUCTION

The year 2020 looked to be a very promising one for state appliance standards until the COVID-19 pandemic forced many state legislatures to adjourn or to operate on a limited basis. Though some legislatures reconvened, most restricted their work to COVID- or budget-related bills, leaving other legislation to die. Nonetheless, there were successes during the past 12 months. New York Governor Andrew Cuomo signed an appliance standards bill in December 2019, the California Energy Commission adopted several new standards, and Oregon Governor Kate Brown signed an executive order directing the state's Department of Energy to establish standards for 10 products by September 1, 2020. Of the 10 states that filed appliance standards bills, those in Massachusetts, New Jersey, and the District of Columbia are still under consideration.

State-level actions on appliance standards have taken on added urgency in recent years, given federal efforts to chip away at the national appliance standards program. Beyond missing legal deadlines for the review of 28 product standards, the current federal leadership has also rolled back light bulb standards that would have saved billions of dollars for consumers and businesses and finalized changes to the federal program to make it harder to update any existing standards. Amid these reversals, as well as ongoing systemic threats to the economy posed by climate change and COVID-19, state-level policies like appliance standards are critical to reduce energy use, save consumers money, and cut climate-changing 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. 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. Businesses saved a total of $23 billion in utility bills that year, or about 8% of total business spending on electricity and

natural gas. Total household and business utility bill savings reached $80 billion in 2015. Annual savings will increase to nearly $150 billion by 2030 as new national standards kick in and the effects of existing ones grow (deLaski and Mauer 2017).

Federal preemption generally prevents states from setting their own standards for federally regulated products. States that wish to implement their own standards after federal preemption generally must apply for a waiver; however, states remain free to set standards for any products that are not subject to national standards. State standards can generate significant energy and water savings and set precedents for adopting new national standards.

States have responded to the federal government's inaction and its efforts to weaken the national standards program. In 2020 lawmakers in 10 states (Arizona, Connecticut, Hawaii, Illinois, Maine, Massachusetts, Oregon, Pennsylvania, Rhode Island, and Vermont) and the District of Columbia pursued standards based on recommendations from the ASAP and ACEEE report *States Go First* (Mauer, deLaski, and DiMascio 2017) and its 2020 update.[68] The efficiency levels for products in the state legislation are based on California standards and ENERGY STAR and WaterSense specifications. Some states added legislative provisions to protect against the rollback of light bulb and other federal standards, and others added language to adopt standards for non-preempted bulbs.

During the period covered by this year's *Scorecard*, New York adopted standards for faucets, showerheads, toilets, urinals, and drinking fountains. The California Energy Commission (CEC) adopted new standards for replacement pool pump motors and spray sprinkler bodies and broadened the scope of general-service lamp standards. Oregon completed a rulemaking on August 28, 2020, establishing new efficiency standards for nine products and updating standards for two others. The standards require legislative approval before they go into effect.

In addition to the above, since 2017, four states (Colorado, Hawaii, Vermont, and Washington) have adopted appliance standards packages varying from 5 products in Hawaii to 18 products in Vermont. The products include computers and monitors, faucets, showerheads, commercial dishwashers, and portable air conditioners. Washington also adopted a design standard for electric storage water heaters that would enable utility programs to manage water heating loads.

States also adopted provisions to protect against the rollback of federal appliance standards (Colorado, Hawaii, Vermont, and Washington) and federal light bulb standards (Colorado, Nevada, Vermont, and Washington). Finally, Hawaii, Nevada, New York, and Washington adopted standards for water-saving products such as faucets, showerheads, toilets, and urinals, joining a handful of drought-prone states (California, Colorado, Georgia, and Texas) that have done so over the past decade. The faucet and showerhead standards will also save energy by reducing hot-water consumption.

[68] The report 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 2.5 points for savings from state-specific appliance standards that are not currently preempted by federal standards; they could earn another 0.5 points for adopting existing federal standards.[69] This scoring system credits states for adopting new standards that substitute for or expand on existing federal standards.

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. Televisions dropped off the list this year since the last compliance date was six years ago, in 2014.

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 on the basis of 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 in order to rank states according to per-capita energy savings. We scored in 0.5-point increments up to a maximum of 2.5 points.

Table 40 shows the scoring breakdown for state standards.

[69] In 2018 and 2019, states could earn 0.5 points for adopting either federal appliance standards or federal light bulbs standards in case federal standards were rolled back. However, in 2019 the Trump administration did roll back and narrow the scope of the light bulb standards. Therefore, in 2020, instead of awarding a flat 0.5 points for adopting non-preempted light bulb standards, we estimated the savings from the standards.

Table 40. Scoring of savings from state appliance standards

Energy savings through 2035 (MMBtus/capita)	Score
35 or more	2.5
25–34.99	2
15–24.99	1.5
5–14.99	1
0.1–4.99	0.5
No energy savings	0

Other consideration	Score
Adoption of existing federal standards	+0.5

Table 41 shows the scoring results, with points allocated for the adoption of both state-specific and federal standards.

Table 41. Scoring for appliance efficiency standards

State	Energy savings from state standards through 2035 (MMBtus/capita)	Year most recent state standards were adopted	Score for adoption of state standards	Score for adoption of federal standards	Total score (3 pts.)
California	41.3	2020	2.5	0.5	3.0
Colorado	19.3	2019	1.5	0.5	2.0
Washington	19.3	2019	1.5	0.5	2.0
Vermont	17.6	2019	1.5	0.5	2.0
Hawaii	14.0	2019	1	0.5	1.5
Nevada	8.9	2019	1	-	1.0
New York	4.4	2019	0.5	-	0.5

California topped the scoring in this metric again this year, earning the maximum of 3.0 points on savings from 11 products, including recent standards for pool pump replacement motors, and for the adoption of federal standards. New York made the list this year for its adoption of plumbing product standards for faucets and showerheads.

Leading and Trending States: Appliance and Equipment Efficiency Standards

California. Just months after the U.S. Department of Energy narrowed the scope of light bulbs subject to federal standards, the California Energy Commission (CEC) broadened the scope of the state's light bulbs standards to address those bulbs no longer covered under federal standards. (Federal legislation adopted in 2007 exempted California from federal preemption on general-service light bulb standards.) CEC also adopted standards for replacement pool pump motors and spray sprinkler bodies. The commission is currently conducting rulemakings for hearth products, irrigation controllers, certain linear fluorescent lamps, and commercial and industrial fans.

New York. In December 2019, Governor Andrew Cuomo signed Assembly Bill A2286, updating water efficiency standards for faucets, showerheads, toilets, urinals, and drinking fountains to EPA's WaterSense levels. The law makes New York the eighth state to adopt updated plumbing standards. It expects to reduce water use by 3.7 billion gallons in 2025, growing threefold to 11.3 billion gallons by 2035, equivalent to the annual water consumption of 160,000 New York households.

Oregon. In March 2020, Governor Kate Brown signed Executive Order 20-04, directing the Oregon Department of Energy to "establish and update energy efficiency standards for products at least to levels equivalent to the most stringent standards among West Coast jurisdictions." The order specifies 10 products for which standards have been adopted by other states and opens the door for more product standards to be added. The rulemaking, completed on August 28, 2020, includes a performance standard for grid-connected water heaters and efficiency standards for computers; commercial dishwashers, fryers, and steamers; high-CRI fluorescent lamps; showerheads; faucets; portable electric spas; residential ventilating fans; and water coolers. The standards require legislative approval.

Chapter 7. Conclusions

The impact of the COVID-19 pandemic on states' economies forced many clean energy plans to be put on hold for much of the year. While some states still managed to advance significant energy efficiency reforms, others faced stay-at-home orders and drastically altered utility operations, leaving energy efficiency contractors unable to access homes and businesses. These upheavals led to the loss of hundreds of thousands of clean energy jobs and stalled some significant legislative efforts (BW Partnership 2020).

Although the slowdown impacted all clean energy sectors, including the renewable energy and clean vehicles industries, the largest impacts were in energy efficiency, especially residential programs, which suspended at-home visits and weatherization services and experienced other drop-offs in customer participation. While some utilities mitigated the pandemic's impact by shifting resources toward programs like virtual home energy audits and improvements to building exteriors and vacant buildings, much uncertainty remains regarding long-term effects on the industry. Many state and local leaders tried to learn from the crisis and emerge with new tools for resiliency and efficiency, such as by increasing opportunities for remote work and adding and expanding spaces for biking and walking.

AMID CRISIS, STATES PLANT SEEDS FOR FUTURE PROGRESS

Despite these challenges, several states kicked off 2020 with a series of strong policy achievements before COVID-19 disrupted their legislative calendars. This progress came on the heels of a banner 2019, in which five states (Maine, Nevada, New Mexico, New York, and Washington), in addition to Washington, DC, and Puerto Rico, enacted 100% clean energy targets.[70]

In March Virginia joined them by enacting the state's Clean Economy Act, becoming the eighth state nationwide and first in the Southeast with a 100% clean energy goal, as well as only the second in the region with a binding energy efficiency resource standard for investor-owned utilities. The bill, which sets a 100% clean energy goal, requires that by 2025 Dominion and Appalachian Power achieve electric savings equivalent to 5% and 2% of sales, respectively. These targets, which roughly equate to the 15th-highest statewide goal among those with an EERS, would avoid more than 7 million metric tons of greenhouse gas emissions over four years and would further reduce emissions well into the future as installed measures continue to save energy.

New Jersey also marked a critical milestone in its efforts to scale up energy efficiency and deliver on robust energy savings goals established under its 2018 Clean Energy Act. Following many months of work by officials and stakeholders, the state's Board of Public Utilities issued an order establishing a framework of programs, including five-year savings targets that ramp up to 2.15% of electric use and 1.1% of natural gas use, among the highest in the nation. It also calls for specific provisions and enhanced incentives for low-income customers to ensure equitable access to programs for these communities. These programs,

[70] Prior to 2019, only California and Hawaii had committed to 100% clean energy goals.

planned for June 2021, will work in parallel with Governor Phil Murphy's recently released economy-wide Energy Master Plan, which lays out a pathway to 100% clean energy by 2050.

New York is also working toward ambitious climate goals and released important regulatory reforms this year. A January order established strong 3% electric savings targets for 2025, including robust targets for heat pumps and low-to-moderate-income programs. These efforts to dramatically scale up efficiency are an important part of achieving the mission of the 2019 Climate Leadership and Community Protection Act, which calls for net-zero carbon emissions by 2050.[71]

Meanwhile, a number of other states, such as Maryland, Nevada, and New Mexico, also reported growing levels of utility-sector savings. These states' efforts to scale up programs to meet efficiency targets are yielding positive results.

EFFICIENCY ADVOCATES WIN BIG ON NATIONAL MODEL ENERGY CODES

This year also delivered major improvements for efficiency in new construction with the release of the 2021 International Energy Conservation Code (IECC) that establishes minimum building energy performance standards. Following more than a year of work by a broad coalition of organizations, ICC voting members—including many cities and states—approved a code update to yield an estimated 10% or greater efficiency improvement in residential and commercial buildings.

Following a decade that saw very few efficiency improvements in the IECC, the new codes are an important achievement for advocates and consumers, securing improvements in lighting efficiency and first-time provisions for water heating equipment. The 2021 IECC also includes two new optional appendices to provide states and cities pathways to incorporate zero-energy performance requirements into their codes through a mix of aggressive yet achievable levels of energy efficiency and renewable energy like rooftop solar panels. This suite of additions represents a significant step forward toward decarbonizing the building sector. While there was also widespread support for provisions requiring electric vehicle and electric appliance readiness as well as increased water heater efficiency, these were ultimately removed by the ICC Board of Directors upon appeal as it was determined these changes were outside the current scope and intent of the IECC's energy provisions.

In addition, close to a dozen states and DC made significant progress towards strengthening efficiency standards for new construction at the state-level. These include many states in which the 2018 IECC has gone into effect in recent months, including Minnesota, New Jersey, New Mexico, New York, Vermont, and Delaware. The new 2021 IECC will offer these states and others further opportunity to ensure that new buildings lock-in low energy costs for generations of future residents.

STATES LEAD ON VEHICLE EMISSIONS AND ELECTRIFICATION

With the federal government moving to roll back Clean Car Standards, many states have taken vehicle efficiency into their purview by advancing tailpipe emissions regulations and

[71] See blog.aee.net/one-giant-leap-for-energy-efficiency-in-new-york.

accelerating the adoption of electric vehicles through incentives and charging infrastructure. More than a dozen states have followed California's lead by adopting the Golden State's vehicle emissions standards, and 12 states have adopted its zero-emission vehicle program. The number is set to continue to grow following announcements in late 2019 and 2020 by governors in Minnesota, New Mexico, and Nevada that their states will also adopt these standards.

States are increasingly prioritizing electric vehicles and the charging infrastructure needed to serve them. Most states have taken some level of action to support EV deployment, from customer incentives to planning to regulatory reforms. Examples include New Jersey's passage of S-2252, an ambitious law intended to meet the governor's commitment to have 330,000 electric cars on the state's roads by 2025; this law also authorizes an incentive program for both light-duty electric vehicles and at-home electric charging infrastructure. The bill calls for the electrification of the state's light-duty vehicle fleet by 2035 and moves NJ Transit toward zero-emission bus purchases by 2032 (New Jersey Office of the Governor 2020).

In February the California Public Utilities Commission released its draft Transportation Electrification Framework that would call on utilities to develop 10-year plans to expand electrification infrastructure throughout the state, including plans for managing increased grid load. The new process would help accelerate the state's progress toward its goals for 250,000 electric vehicle chargers along with 1.5 million ZEVs on California roads by 2025, and 5 million ZEVs by 2030.

Utah passed multiple important pieces of legislation to move ahead on vehicle electrification, including HB 259, which calls on the state transportation agency to develop a statewide plan for an electric vehicle charging network, including additional funding to address areas served by rural electric cooperatives. HB 396, also passed this year, authorizes Rocky Mountain Power to collect $50 million toward the buildout of its EV charging infrastructure, with additional provisions allowing the utility to update rate designs for EV charging customers (Utah Clean Energy 2020).

Other states and major utilities also continued to roll out electrification plans of their own in 2020, including Pacific Power in Oregon and Xcel Energy in Colorado. In addition, a number of states, such as Connecticut, Virginia, Missouri, and Wisconsin, continue to conduct EV needs assessments and evaluate the appropriate roles for utilities and private entities in building EV infrastructure (NCCETC 2020).

DATA LIMITATIONS

The scoring framework used in this report is our best attempt to represent a variety of efficiency metrics as a quantitative score. Any effort to convert state spending data, energy savings data, and adoption of best-practice policies across five policy areas into one state energy efficiency score has obvious limitations. One of the most pronounced constraints is access to recent, reliable data on the results of energy efficiency. Because many states capture relatively little data on energy efficiency policy efforts, often under varying 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 a way 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, not all are able to relay information on program budgets or the energy savings resulting from such initiatives. 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 bring to bear on utility programs.

POTENTIAL NEW METRICS

Looking ahead, we have described relevant potential future metrics or revisions to existing metrics in several chapters of this year's *State Scorecard*. While we believe our data collection and scoring methodology are comprehensive, there is always room for modifications. As the energy efficiency market continues to evolve and data become more available, we will continue to adjust each chapter's scoring metrics. Here we present some additional metrics that currently fall outside the scope of our report but nonetheless indicate important efficiency pathways.

In response to policy trends and feedback from subject matter experts, this year we added several new scoring categories intended to capture emerging state efforts around EV grid integration and building decarbonization. These include scoring that considers statewide numbers of publicly available charging stations, as well as zero-energy building projects. The goal of these metrics is to provide an approximate outcome-based assessment of the relative success of ongoing policy efforts.

As more states develop and undertake electrification plans in support of ever-strengthening clean energy goals, we plan to continue to develop the *Scorecard* to consider the role of efficiency programs in promoting the switch from fossil fuels to technologies powered by clean electricity. For example, as previewed in Chapter 2, ACEEE research has begun to track the status of current state policies and utility efficiency programs enabling fuel switching, particularly in cases where it is beneficial, enabling transitions from higher-cost, higher-emission fuel sources for heating to lower-cost, lower-emitting fuel sources. While the current utility policy landscape in this emerging field is complex and fragmented, our goal is to use the *Scorecard* to highlight the work of leading states to harmonize energy efficiency rules with electrification and accelerate the transition to a carbon-free future in a way that maximizes public benefits.

Finally, another important area of focus for ACEEE is the advancement of social equity principles in clean energy and efficiency policy and program design to ensure that the economic, health, and safety benefits of energy efficiency and clean energy reach all communities. Energy efficiency initiatives have typically not been adequately extended to marginalized and historically disadvantaged groups, nor to rural and low-income areas,

where energy burdens are disproportionately high. While the *Scorecard* currently addresses low-income household access to programs to a limited extent in several chapters, ACEEE plans to use the report in the future to call greater attention to broader efforts to embed equity in community engagement, decision making, and workforce development. Through our annual data collection this year, we sought information on these types of efforts, including needs assessments, barrier analyses, job training, and the adoption of internal protocols and metrics to evaluate the equity of policy outcomes. While we have yet to formally integrate these data and principles into our scoring framework, we hope to do so in the future. Meanwhile, we have included this information on our State and Local Policy Database as a resource for communities, policymakers, and utilities to help track emerging best practices.[72]

[72] See database.aceee.org/state/equity-workforce.

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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	Maureen Neighbors, Director, and Susan Fleeman, Energy Division, Alabama Department of Economic and Community Affairs	—
Alaska	Jimmy Ord, Energy Program Information Manager, Alaska Housing Finance Corp.	—
Arizona	—	—
Arkansas	—	Jane Carpenter, Rate Case Analyst, Arkansas Public Service Commission
Bonneville Power Administration	—	Adam Morse, Bonneville Power Administration
California	Bill Pennington, Deputy Division Chief, Efficiency and Renewable Energy Division, California Energy Commission	Amanda Jordan Christenson, Energy Efficiency Analyst, California Public Utilities Commission
Colorado	Andrew Sand, 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	Jessica Quinn, Renewable Energy Planner, Delaware Division of Energy & Climate	Jessica Quinn, Renewable Energy Planner, Delaware Division of Energy & Climate
District of Columbia	Ben Plotzker, EM&V Project Manager, Vermont Energy Investment Corporation	Ben Plotzker, EM&V Project Manager, Vermont Energy Investment Corporation
Florida	April Groover Combs, Senior Management Analyst, Office of Energy, Florida Department of Agriculture and Consumer Services	Michael Barrett, Economic Supervisor, Conservation, Florida Public Service Commission
Georgia	Kristofer Anderson, Senior Program Manager, 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 Program Manager, Hawaii State Energy Office	Ashley Norman, Utility Analyst, Hawaii Public Utilities Commission
Idaho	Katie Pegan, Policy Analyst, Idaho Governor's Office of Energy and Mineral Resources	—
Illinois	—	David Brightwell, Economist, Illinois Commerce Commission
Indiana	—	—
Iowa	Shelly Peterson, Program Manager, Iowa Economic Development Authority	Donald Tormey, Iowa Utilities Board
Kansas	—	—

State	Primary state energy office data request respondent	Primary public utility commission data request respondent
Kentucky	—	—
Louisiana	—	Kathryn Bowman Louisiana Public Service Commission
Maine	Dan Burgess, Director, and Melissa Winne, Energy Policy Analyst, Governor's Energy Office	Jack Riordan, Strategic Initiatives, Efficiency Maine
Maryland	Jenn Gallicchio, Assistant Director of Energy Programs, Maryland Energy Administration	—
Massachusetts	Lyn Huckabee, Residential Energy Efficiency Program Coordinator, Massachusetts Department of Energy Resources	Lyn Huckabee, Residential Energy Efficiency Program Coordinator, Massachusetts Department of Energy Resources
Michigan	Julie Staveland, SEP Specialist, Michigan Energy Office	Fawzon Tiwana, Economic Analyst, Michigan Public Service Commission
Minnesota	Anthony Fryer, Conservation Improvement Program Coordinator, Minnesota Department of Commerce	Anthony Fryer, Conservation Improvement Program Coordinator, Minnesota Department of Commerce
Mississippi	Ethan Cartwright, Energy Efficiency Program Manager, Mississippi Development Authority	Vicki Munn, Electric, Gas & Communications Division, Mississippi Public Utilities Staff
Missouri	Cherylyn Kelley, Energy Policy Analyst, Missouri Department of Economic Development	Brad Fortson, Manager, Energy Resources Department, Missouri Public Service Commission
Montana	Kyla Maki, Montana Department of Environmental Quality	Robin Arnold, Policy Analyst, Montana Public Service Commission
Nebraska	Joe Francis, Associate Director, Nebraska Department of Environment and Energy	Marc Shkolnick, Manager of Energy Services, Lincoln Electric System
Nevada	Robin Yochum, Energy Program Manager, Nevada Governor's Office of Energy	Cristina Zuniga, Economist, Nevada Public Utility Commission
New Hampshire	Alexis LaBrie, Energy Analyst, New Hampshire Office of Strategic Initiatives	—
New Jersey	Kelly Mooij, Deputy Director, New Jersey Board of Public Utilities	Kelly Mooij, Deputy Director, New Jersey Board of Public Utilities
New Mexico	Harold Trujillo, Bureau Chief, Energy Technology and Engineering, New Mexico Energy Office	John Reynolds, 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	Russell Duncan, Energy Assurance Manager, North Carolina Department of Environmental Quality	Jack Floyd, Engineer, Electric Division, Public Staff, North Carolina Utilities Commission

State	Primary state energy office data request respondent	Primary public utility commission data request respondent
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	Katie DeMuth, Energy Policy Advisor and Legislative Affairs Director, Office of the Secretary of Energy and Environment	Kathy Champion, Regulatory Analyst, Oklahoma Corporation Commission
Oregon	Warren Cook, Manager, Energy Efficiency and Conservation, Oregon Department of Energy	Warren Cook, Manager, Energy Efficiency and Conservation, Oregon Department of Energy; Michael Freels, Energy Analyst, Oregon Department of Energy
Pennsylvania	Libby Dodson, Energy Program Specialist, Department of Environmental Protection	Joseph Sherrick, Supervisor, Policy and Planning, Pennsylvania Public Utility Commission
Rhode Island	Nathan Cleveland, Energy Efficiency Policy and Program Manager, Rhode Island Office of Energy Resources	—
South Carolina	—	Jocelyn Boyd, Chief Clerk, South Carolina Public Service Commission
South Dakota	—	Darren Kearney, Utility Analyst, South Dakota Public Utilities Commission
Tennessee	Shauna Basques, Office of Energy Programs, Tennessee Department of Environment and Conservation	Erik Franey, Specialist, Commercial Energy Solutions, Tennessee Valley Authority
Texas	Erik Funkhouser, Program Contract Manager, State Energy Conservation Office	—
Utah	Brooke Tucker, Deputy Director, Governor's Office of Energy Development	Carol Revelt, Executive Staff Director, 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
Virginia	Barbara Simcoe, State Energy Program Manager, Virginia Division of Energy, Department of Mines, Minerals, and Energy	—
Washington	Emily Salzberg, Managing Director, Building Standards and Performance, Washington State Department of Commerce Karin Landsberg, Senior Policy Specialist, Washington State Department of Transportation	—
West Virginia	Tiffany Bailey, Energy Development Specialist, West Virginia Division of Energy	Karen Hall, Public Information Specialist, Public Service Commission of West Virginia

State	Primary state energy office data request respondent	Primary public utility commission data request respondent
Wisconsin	—	Jolene Sheil, Focus on Energy Performance Manager, Public Service Commission of Wisconsin
Wyoming	Sarah Young Director, Public Affairs & Communications Wyoming Energy Authority	—

Appendix B. Electric Efficiency Program Spending per Capita

State	2019 electric efficiency spending ($ million)	$ per capita
Rhode Island	104.1	98.24
Massachusetts	620.4	90.02
Vermont	55.2	88.46
Maryland	275.6	45.58
Connecticut	161.4	45.28
California	1516.4	38.38
Oregon	161.5	38.28
New Hampshire	48.6	35.74
Idaho	61.4	34.37
Illinois	433.8	34.23
Maine	45.9	34.12
New York	645.2	33.17
Hawaii	42.0	29.66
Minnesota	157.0	27.84
Michigan	250.7	25.10
Washington	190.7	25.05
Iowa	75.6	23.95
Arkansas	68.0	22.52
District of Columbia	15.4	21.79
Colorado	108.0	18.75
Delaware	17.9	18.41
Wyoming	10.2	17.66
Oklahoma	68.6	17.34
Pennsylvania	197.5	15.43
Indiana	101.8	15.12
New Mexico	31.7	15.12
Ohio	175.0	14.97
Nevada	45.3	14.71
Utah	47.1	14.69
Missouri	85.8	13.98
North Carolina	145.8	13.90
New Jersey	123.0	13.85
Wisconsin	79.0	13.57
Montana	14.4	13.44
South Carolina	64.0	12.43
Arizona	82.4	11.32
Texas	196.2	6.77
Kentucky	27.2	6.09
Mississippi	17.1	5.74
Georgia	57.0	5.37
South Dakota	4.7	5.31
Louisiana	24.6	5.29
Florida	105.4	4.91
West Virginia	7.6	4.24
Virginia	31.7	3.72
Nebraska	7.1	3.65
Tennessee	19.2	2.81
Alabama	7.7	1.57
North Dakota	0.2	0.20
Kansas	0.3	0.11
Alaska	0.0	0.03
U.S. total	**6,832.4**	
Median	**64.0**	**15.12**

Appendix C. Large-Customer Self-Direct Programs by State

State	Availability	Description
Arizona	Customers of Arizona Public Service Company (APS), Tucson Electric Power Company (TEP), and Salt River Project (SRP)	APS: Large customers using at least 40 million kWh per calendar year can elect to self-direct energy efficiency funds. Customers must notify APS each year if they wish to participate, after which 85% of the customer's demand-side management contribution will be reserved for future energy efficiency projects. Projects must be completed within two years. Self-direct funds are paid once per year, once the project is completed and verified by APS. TEP: To be eligible for self-direct, a customer must use a minimum of 35 million kWh per calendar year. SRP: SRP makes self-direct available only to very large customers using more than 240 million kWh per year. For all utilities, a portion of the funds that customers would have otherwise contributed to energy efficiency is retained to cover self-direct program administration, management, and evaluation costs.
Colorado	Customers of Xcel Energy and Black Hills	Xcel: The self-direct program is available to commercial and industrial (C&I) electric customers who have an aggregated peak load of at least 2 MW in any single month and an aggregated annual energy consumption of at least 10 GWh. Self-direct program customers cannot participate in other conservation products offered by the company. Rebates are paid based on actual savings from a project, up to $525 per customer kW or $0.10 per kWh. Rebates are given for either peak demand or energy savings, but not both, and are limited to 50% of the incremental cost of the project. Xcel uses raw monitoring results and engineering calculations to demonstrate actual energy and demand savings. Black Hills: To participate in the C&I self-direct program, customers must have an aggregated peak load greater than 1 MW in any single month and aggregated annual energy usage of 5,000 MWh. Rebates and savings are calculated on a case-by-case basis, with rebate values calculated as either 50% of the incremental cost of the project or $0.30 per kWh savings, whichever is lower.
Idaho	Customers of Idaho Power	Idaho Power offers its largest customers an option to self-direct the 4% energy efficiency rider that appears on all customers' bills. Customers have three years to complete projects, with 100% of the funds available to fund up to 100% of project costs. Self-direct projects are subject to the same criteria as projects in other efficiency programs.
Illinois	Statewide	Electric customers with greater than 10 MW of demand in any 30-minute period are exempt from programs. A self-direct option is available statewide for natural gas customers who meet the following criteria: annual natural gas usage in the aggregate of 4 million therms or more within the service territory of the affected gas utility, or with aggregate usage of 8 million therms or more in the state and using natural gas as feedstock to the extent such annual feedstock usage is greater than 60% of the customer's total annual usage of natural gas. Qualified natural gas customers put money into an account of their own that amounts to the lesser of 2% of the customer's cost of natural gas or $150,000. The funds are required to be used for energy efficiency projects. No evaluation is required.

State	Availability	Description
Michigan	Statewide	Self-direct is available statewide. Customers must have had an annual peak demand in the preceding year of at least 1 megawatt in the aggregate at all sites. Customers may use the amount of funds that would otherwise have been paid to the utility provider for energy efficiency programs. They must, however, submit the portion of the EE funds that would have been collected and used for low-income programs to their utility provider. They then calculate the energy savings achieved and provide it to their utility provider. In 2018, there were 15 customers self-directing.
Minnesota	Statewide	Minnesota offers a self-direct option, with a full exemption from assigned cost-recovery mechanism (CRM) fees, to customers with 20 MW average electric demand or 500,000 Mcf of gas consumption. Customers must also show that they are making "reasonable" efforts to identify or implement energy efficiency and that they are subject to competitive pressures that make it helpful for them to be exempted from the CRM fees. Participating customers must submit new reports every five years to maintain exempt status. The utility is not involved in self-direct program administration; the state Department of Commerce manages self-direct accounts and is the arbiter of whether a company qualifies for self-direct and is satisfying its obligations.
Montana	Statewide (all regulated public utilities)	Self-direct is available statewide in regulated utility service territory. About 90% of the population is served by NorthWestern Energy. NorthWestern Energy allows customers with demand larger than 1 MW to channel their cost-recovery mechanism (CRM) funds to an escrow account that repays them on a quarterly basis for completed self-direct projects. The annual maximum contribution is $500,000, and companies have two years to use their funds before they are returned to the larger pool of CRM revenues. NorthWestern administers the funds but provides no measurement or verification. Self-direct customers file annual reports with the Montana Department of Revenue. The department publishes these reports, and a public "challenge" process is provided for as the only scrutiny or review. About 60 customers use self-direct, approximately 89% of eligible large customers.
New Jersey	Statewide	A Societal Benefits Credit (SBC) program, with elements of a self-direct program, allows commercial and industrial ratepayers to establish a credit against their SBC contributions. No company has implemented an SBC program to date. The credit would be equal to one-half of the costs incurred for the purchase and installation of Clean Energy Program–supported energy efficiency products and services in the preceding calendar year, and up to 50% of the SBC contributions for a given year, per utility account. The Large Energy Users Program is designed to promote self-investment in energy efficiency and combined heat and power projects with incentives of up to $4 million for eligible projects in the state's largest commercial and industrial facilities.

State	Availability	Description
New Mexico	Statewide in the territories of three investor-owned utilities	Eligible customers must have electricity consumption greater than 7,000 MWh per year. Participants can receive credit for up to 70% of the annual energy efficiency rider. Self-direct customers provide their own engineering analysis and must meet the same total resource cost test as all the other industrial and commercial offerings. The customer must demonstrate to the reasonable satisfaction of the utility that its expenditures are cost effective. Eligible expenditures must have a simple payback period of more than one year but less than seven years.
New York	Statewide (all six electric utilities)	In an order issued February 26, 2015 (REV Order), the commission required staff to work with the utilities and large industrial customers to develop Self-Direct Program Guidelines to be filed by August 3, 2015. The order also required electric utilities to implement a self-direct program in accordance with the Self-Direct Program Guidelines no later than January 1, 2017. The Self-Direct Program is available to all individual customers with a 36-month average demand of 2 MW or greater. It is also available to customers with an aggregated 36-month average demand of 4 MW or greater, as long as one or more of the accounts being aggregated by the customer has at least a 36-month average demand of 1 MW. To be eligible to participate in the upcoming three-year cycle, current participants in the Self-Direct Program must have accessed 100% of any funds rolled over from the previous cycle, at least 45% of the funds from their ESA by September 30 of the third year of the current cycle, and have achieved savings at or below the dollar per MWh to which the participant committed at the time of enrollment. The initial three-year cycle for the Self-Direct programs ran from 2017 through 2019. Enrollment in the Self-Direct programs was generally minimal and, therefore, in a March 2018 order, the commission allowed each utility to determine whether to continue to offer its large energy-user customers a self-direct program.

State	Availability	Description
Oregon	Customers of Portland General Electric, PacifiCorp, and select customers of Emerald People's Utility District	Senate Bill 1149 directed Oregon's two largest utilities, Portland General Electric and Pacific Power, to collect a public purpose charge from their customers to fund energy conservation and renewable projects in the state. However, large electric consumer sites that used more than 8,760,000 kWh in the prior year may be eligible for the Large Electric Consumer Public Purpose Program, also known as the Self-Direct Program, which allows them to self-direct the conservation and renewable portions of their public purpose charge rather than pay the utility directly. The Oregon Department of Energy (ODOE) reviews applications and approves sites that meet eligibility criteria to become self-direct consumers. Sites then spend their own funds to build pre-certified projects. Once the project is complete, they submit an application for credit to ODOE. ODOE reviews and approves the eligible project costs, which include a small fee paid to ODOE for program administration. Certified project costs are then added to the conservation or renewable credit balance, and the credits do not expire. Each month when a site has a conservation and renewable credit balance, they can offset the monthly conservation and renewable portion of the public purpose charge, meaning they do not pay the utility that portion of the PPC. The available credit balance is reduced by the monthly conservation and renewable offset amount. Two former Pacific Power sites in Emerald People's Utility District (EPUD—a COU utility—territory participates in a self-direction program, but no COUs including EPUD are subject to public purpose charge requirements. Portland General Electric and Pacific Power cover approximately 80% of the electric customers in Oregon. Participants in the three participating programs have their proposed projects technically reviewed by the Oregon Department of Energy. This includes a technical review of claimed savings. A sampling of projects is reviewed for actual performance. Eighty sites, or roughly one-third of eligible sites, currently self-direct energy efficiency funds, accounting for about one-third of eligible load. Total savings for 2019 was 1,634,309 kWh.

State	Availability	Description
Vermont	Statewide for electric and natural gas customers	For electric energy efficiency, there are three self-direct options available statewide: Self-Managed Energy Efficiency Program (SMEEP), Customer Credit Program (CCP), and Energy Savings Accounts (ESA). SMEEP is also available for the two eligible gas customers. The SMEEP options require prospective participants or their successors to have contributed $1.5 million to the Energy Efficiency Fund in 2008 or 2017 through the Efficiency Charge added on their electric bills to meet the requirements. Currently there are two customers in the program. Additionally, an eligible customer must commit to investing a minimum of $3 million over a three-year program cycle. For SMEEP electric, an eligible customer must demonstrate that it has a comprehensive energy management program with annual objectives or demonstrate that it has achieved certification of ISO standard 14001. They then provide a report to the PUC detailing the measures undertaken, estimated savings and related costs. These reports are then reviewed and approved by the PUC. In addition, the Vermont PUC has established an option for eligible Vermont business customers to self-administer energy efficiency through the use of an Energy Savings Account (ESA) or the Customer Credit Program. These funds are still paid into the VEEUF and disbursed to the participants upon completion of an eligible energy efficiency measure. The ESA option allows Vermont businesses that pay an Energy Efficiency Charge (EEC) in excess of $5,000 total per year (or an average $5,000 total per year over three years) to use a portion of their EEC to support energy efficiency projects in their facilities. The ESA is run through the Efficiency Vermont program and related savings are reported and verified through the Savings Verification mechanism. For CCP, eligible customers must be ISO 14001-certified and meet several conditions similar to Energy Star for industrial facilities. For natural gas energy efficiency, eligible only for transmission and industrial electric and natural gas ratepayers. A pilot program has been developed to allow customers selected through a competitive process to be able to self-direct a large portion of the funds collected through the electric EEC paid by that customer to both electric and thermal energy efficiency projects. This pilot is capped at $2 million annually.
Washington	All utilities may develop self-direct options for industrial and commercial customers, but of the IOUs, only Puget Sound Energy has developed a self-direct program	Puget Sound Energy's self-direct program is available only to industrial or commercial customers on electric rate-specific rate schedules. The self-direct program operates on a four-year cycle comprising two phases: noncompetitive and competitive. During the noncompetitive phase, customers have exclusive access to their energy efficiency funds, which are collected over the four-year period. When this phase ends, any unused funds are pooled together and competitively bid on by the members of the self-direct program. Customers receive payment in the form of a check once their project is complete and verified. Participating customers do not receive any rate relief when they complete energy efficiency investments. The utility pre- and post-verifies 100% of the projects, including a review and revision of savings calculations to determine incentive levels. The program is included in the third-party evaluation cycle like any other utility conservation program.

State	Availability	Description
Wisconsin	Statewide	A self-direct option is open to customers that meet the definition of a large energy customer according to the 2005 Wisconsin Act 141. Under the self-direct option, a true-up at the end of the year returns contributions to participating customers for use on energy efficiency projects. Evaluation is required under Public Service Commission Administrative Code 137, with evaluation plans reviewed by that commission. This option has been available since 2008, but no customers have participated to date.

Appendix D. State Energy Efficiency Resource Standards

State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
Arizona 2010 Regulatory Electric and nat. gas IOUs, co-ops (~56%)	Electric: Incremental savings targets began at 1.25% of sales in 2011, ramping up to 2.5% in 2016–20 for cumulative annual electricity savings of 22% of retail sales, 2% of which may come from peak demand reductions. Natural gas: ~0.6% annual savings (for cumulative savings of 6% by 2020). Co-ops must meet 75% of targets.	2.1% (standard terminates in 2020)	Binding	Docket No. RE-00000C-09-0427, Decision 71436 Docket No. RE-00000C-09-0427, Decision 71819 Docket No. RG-00000B-09-0428, Decision 71855	2.5
Arkansas 2018 Regulatory Electric and nat. gas IOUs (~50%)	Electric: Incremental targets for PY 2020–22 of 1.2% of 2018 retail sales for electric IOUs. Natural gas: Annual incremental reduction target of 0.50% for 2020–22 for natural gas IOUs.	1.2% (net)	Opt-out	Order No. 17, Docket No. 08-144-U Order No. 1, Docket No. 13-002-U Order No. 7, Docket No. 13-002-U Order No. 31, Docket No. 13-002-U Order No. 43, Docket No.13-002-U	1.5
California 2004, 2009, and 2015 Legislative Electric and nat. gas IOUs (~73%)	While SB 350, signed in 2015, called on state agencies and utilities to double cumulative efficiency savings achieved by 2030, work to develop specific utility targets is ongoing. Electric: Average incremental savings targets of about 1.3% of retail electricity sales from 2020–25. Natural gas: Incremental savings targets average 0.5% from incentive and codes and standards programs for natural gas from 2020–25. Utilities must pursue all cost-effective efficiency resources.	1.6% (gross) 1.3% (net)	Binding	CPUC Decision 15-10-028 CPUC Decision 17-09-025 CPUC Decision 19-08-034 AB 995 SB 350 (10/7/15) AB 802 (10/8/15)	1.5

State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
Colorado 2007 and 2017 Legislative Electric and nat. gas IOUs (~56%)	Electric: For 2015–18, PSCo was required to achieve incremental savings of at least 400 GWh per year; starting in 2019, this was increased to 500 GWh, or roughly 1.7% of sales. HB 17-1227 extends programs and calls for 5% energy savings by 2028 compared with 2018. Natural gas: Savings targets commensurate with spending targets (at least 0.5% of prior year's revenue).	1.7%	Binding	Colorado Revised Statutes 40-3.2-101, et seq.; Docket No. 13A-0686EG Dec. C14-0731 HB17-1227 Proceeding no. 17A-04262EG: Settlement Agreement (2/26/18) Dec. C18-0417 approving settlement agreement in proceeding 17A-0462EG	2.0
Connecticut 2007 and 2013 Legislative Electric and nat. gas IOUs (~93%)	Electric: Average incremental savings of 1.11% of sales from 2019 through 2021. Natural gas: Average incremental savings of 0.59% per year from 2019 through 2021. Utilities must pursue all cost-effective efficiency resources.	1.1%	Binding	Public Act No. 07-242 Public Act No. 13-298 2019–21 Electric and Natural Gas Conservation and Load Management Plan	1.5
Hawaii 2004 and 2009 Legislative Electric Statewide goal (100%)	In 2009, transitioned away from a combined RPS-EERS to a stand-alone Energy Efficiency Portfolio Standard (EEPS) goal to reduce electricity consumption by 4,300 GWh by 2030 (equal to ~30% of forecast electricity sales, or 1.4% annual savings).	1.4%	Binding	HRS §269-91, 92, 96 HI PUC Order, Docket No. 2010-0037	1.0
Illinois 2007 and 2016 Legislative Electric and nat. gas utilities with more than 100,000 customers, Illinois DCEO (~89%)	Electric: Incremental savings targets vary by utility, averaging 1.77% of sales from 2018 to 2021, 2.08% from 2022 to 2025, and 2.05% from 2026 to 2030. SB 2814 also sets a rate cap of 4%, allowing targets to be adjusted downward should utilities reach spending limits. Natural gas: 8.5% cumulative savings by 2020 (0.2% incremental savings in 2011, ramping up to 1.5% in 2019).	2.0%	Cost cap	S.B. 1918 (2009) Public Act 96-0033 § 220 ILCS 5/8-103 S.B. 2814 (2015) Public Act 99-0906 Illinois Energy Efficiency Stakeholder Advisory Group	2.5

State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
Iowa 2009 and 2018 Legislative Electric and nat. gas IOUs (75%)	Requirements for utility submission of energy efficiency goals to the Iowa Utilities Board (IUB) are outlined in Iowa Code § 476.6(13). Incremental savings targets vary by utility and have been reduced significantly by a 2% cost cap for electric energy efficiency under Iowa Code § 476.6(15)(c)(2) (1.5% cap for natural gas). Current gross savings targets average 0.9% of electric sales and 0.2% for natural gas according to five-year utility plans (2019–23). Iowa Code § 476.6(13) requires municipal utilities and rural cooperatives to offer energy efficiency savings programs, but their plans are not reviewed or approved by the IUB.	0.9%	Binding	Senate Bill 2386 Docket EEP-2012-0001 SF 2311 (2018) Iowa Code chapter 1135, § 476.6	1.0
Maine 2009 Legislative Electric and nat. gas Efficiency Maine (100%)	Electric: Incremental gross savings targets of ~1.25% per year for 2020–2022 or roughly 1% net savings. Natural gas: Incremental savings of ~0.1% per year for 2020–2022. Efficiency Maine operates under an all cost-effective mandate.	1.25% (gross) 1.0% (net)	Opt-out	Efficiency Maine Triennial Plan (2014–16) Efficiency Maine Triennial Plan (2017–19) Efficiency Maine Triennial Plan (2020–22) HP 1128 – LD 1559	2.5
Maryland 2008 and 2015 Legislative Electric IOUs (97%)	Electricity use reduction goal of 15% per capita by 2015 (10% by utilities, 5% achieved independently); 15% reduction in per capita peak demand by 2015 compared with 2007. After 2015, targets vary by utility, ramping up by 0.2% per year to reach 2% incremental savings.	2.0% (gross) 1.6% (net)	Binding	Maryland Public Utility Companies Code § 7-211 Maryland PSC Docket Nos. 9153–9157 Order No. 87082	1.5

State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
Massachusetts 2009 Legislative Electric and nat. gas IOUs, co-ops, munis, Cape Light Compact (85%)	Electric: Net annual savings of 3.45 million MWh (not including fuel switching) for 2019–21, equivalent to savings of about 2.7% of retail sales per year. Natural gas: Savings goals of 1.25% of retail sales. Net annual savings of 95.89 MMTherms for 2019–21. Additional goal of 261.9 million net lifetime MMBtu for 2019–21. All cost-effective efficiency requirement.	2.7%	Binding	M.G.L. ch. 25, § 21; D.P.U. 18-110 through D.P.U. 18-119 (MA Joint Statewide Three-Year Energy Efficiency Plan for 2019 through 2021.)	3.0
Michigan 2008 and 2016 Legislative Electric and nat. gas Statewide goal (100%)	Electric: 1.0% incremental savings. Natural gas: Incremental savings of 0.75%. Targets carry forward in perpetuity for most utilities but end in 2021 for non-rate-regulated utilities (approximately 10% of state electric load).	1.0%	Binding	Act 295 (2008) S.B. 438 (2016)	1.5
Minnesota 2007 Legislative Electric and nat. gas IOUs, co-ops with more than 5,000 customers, and munis with more than 1,000 customers (~97%)	Electric: 1.5% incremental savings in 2010 and each year thereafter. Senate File 1456 signed in May 2017 exempts some rural utilities from meeting energy efficiency requirements through the Conservation Improvement Program (CIP). Natural gas: 0.75% incremental savings per year in 2010–12; 1% incremental savings in 2013 and each year thereafter.	1.5% (net) 1.2% (gross)	Binding	Minn. Stat. § 216B.241 SF 1456	1.5

State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
Nevada 2005 and 2009 Legislative Electric IOUs (88%)	20% of retail electricity sales to be met by renewables and energy efficiency by 2015, and 25% by 2025. Energy efficiency may meet a quarter of the standard through 2014 but is phased out of the RPS by 2025. SB 150, signed June 2017, directed the Nevada Public Utilities Commission to set new savings goals for NV Energy. The utility's 2018 Joint IRP Demand Side Plan established statewide goals of 1.18% in 2019, 1.14% in 2020, and 1.14% in 2021.	1.1%	Binding	NRS 704.7801 et seq.; Docket: 17-08023 – Investigation and rulemaking to implement Senate Bill 150 (2017) Docket No. 18-06003	1
New Hampshire 2016 Regulatory Electric and nat. gas Statewide goal (100%)	Electric: 0.8% incremental savings in 2018, ramping up to 1% in 2019 and 1.3% in 2020. Natural gas: 0.7% in 2018, 0.75% in 2019, and 0.8% in 2020.	1.3%	Binding	NH PUC Order No. 25932, Docket DE 15-137	1.5
New Jersey 2018 Legislative Electric and nat. gas Statewide goal (100%)	Electric: Under 2018 legislation A3723/S2314, utilities must achieve 2% of electric savings (as a percentage of average annual usage from the prior three years) within five years. Natural gas: Must achieve 0.75% of natural gas usage (as a percentage of average annual usage from the prior three years) within five years.	1.6%	Binding	A3723/S2314 (2018)	2
New Mexico 2008 and 2013 Legislative Electric IOUs (69%)	The state's three public utilities must achieve 5% savings of 2020 retail sales by 2025. HB 291 (2019) directs the Public Regulation Commission to set additional targets through 2030.	1.0%	Binding	NM Stat. § 62-17-1 et seq. HB 291	1

State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
New York 2008, 2016, 2018, and 2020 Regulatory Electric and nat. gas Statewide goal (100%)	An April 2018 NYSERDA white paper called for 185 TBtus of cumulative annual site energy savings under the 2025 energy use forecast, as well as an electric site savings sub-target of 3% of IOU sales in 2025. A December 2018 PSC Order adopting the 3% electric goal calls for utilities to propose detailed targets. Natural gas goals ramp up to 1.3% by 2025. In January 2020, the PSC authorized annual incremental utility-specific budgets and savings targets for electric, gas, and heat pump portfolios.	2.0%	Binding	NY PSC Order Authorizing the Clean Energy Fund Framework Energy Efficiency Metrics and Target Options Report (November 2016) New Efficiency: New York (2018) NY PSC Case 18-M-0084	2.5
North Carolina 2007 Legislative Electric Statewide goal (100%)	Renewable Energy and Energy Efficiency Portfolio Standard (REPS) requires renewable generation and/or energy savings of 6% by 2015, 10% by 2018, and 12.5% by 2021 and thereafter. Energy efficiency is capped at 25% of target, increasing to 40% in 2021 and thereafter. REPS for electric cooperatives and munis requires renewable generation and/or energy savings of 3% by 2012, 6% by 2014, and 10% by 2018.	Combined RPS/EERS	Opt-out	NC Gen. Stat. § 62-133.8 04 NCAC 11 R08-64, et seq.	0
Oregon 2010 Regulatory Electric and nat. gas Energy Trust of Oregon (~61%)	Electric: Incremental targets average ~1.3% of sales annually for the period 2020–2021. Natural gas: ~0.5% of sales annually for 2020–2021	1.3% (gross) 1.2% (net)	Binding	Energy Trust of Oregon 2020 Annual Budget and 2020–2021 Action Plan Grant Agreement between Energy Trust of Oregon and OR PUC	1.5
Pennsylvania 2004 and 2008 Legislative Electric Utilities with more than 100,000 customers (96%)	Varying targets have been set for IOUs amounting to yearly statewide incremental savings of 0.6% for 2021–2026. EERS includes peak demand targets. Energy efficiency measures may not exceed an established cost cap.	0.6%	Cost cap	66 Pa. C.S. § 2806.1 Act 129 Phase IV Program Implementation Order (6/18/2020): Docket No. M-2020-3015228.	0.5

State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
Rhode Island 2006 Legislative Electric and nat. gas IOUs, munis (~99%)	Electric: Average incremental savings of 2.5% for 2018–20. EERS includes demand response targets. Natural gas: Incremental savings of 0.97% for 2018–20. Utilities must acquire all cost-effective energy efficiency.	2.5%	Binding	RIGL § 39-1-27.7 Docket No. 4443 National Grid's 2018–20 Energy Efficiency and System Reliability Procurement Plan	3.0
Texas 1999 and 2007 Legislative Electric IOUs (74%)	20% incremental load growth in 2011 (equivalent to ~0.10% annual savings); 25% in 2012, and 30% in 2013 and onward. Peak demand reduction targets of 0.4% compared with previous year. Energy efficiency measures may not exceed an established cost cap.	0.2%	Cost cap, opt-out	SB 7 HB 3693 Substantive Rule § 25.181 SB 1125	0
Vermont 2000 Legislative Electric Efficiency Vermont, Burlington Electric (98%)	Electric: Annual incremental savings totaling 357,400 MWh over 2018–20, or approximately 2.4% of annual sales. EERS includes demand response targets. Natural gas: Three-year annual incremental savings of 192,599 Mcf spanning 2018–20 or 0.5% of sales. Energy efficiency utilities must set budgets at a level that would realize all cost-effective energy efficiency.	2.4%	Binding	30 V.S.A. § 209; Efficiency Vermont Triennial Plan 2018–20 Order Re: Quantifiable Performance Indicator Targets for Vermont Gas Systems (12/23/15) EEU-2016-03: PUC Order on 10/12/17 re: Performance Targets	2.5
Virginia 2020 Legislative Electric IOUs (87%)	The 2020 Virginia Clean Economy Act requires Dominion Energy to achieve 5% energy savings by 2025 relative to a 2019 baseline. ApCo must achieve 2% by 2025, relative to a 2019 baseline. Statewide these goals translate to average incremental annual savings of approximately 1.2% over four years.	1.2%	Binding	Virginia Clean Economy Act	1.0

State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
Washington 2006 Legislative Electric IOUs, co-ops, munis (83%)	Biennial and 10-year goals vary by utility. Law requires savings targets to be based on the Northwest Power Plan, which targets acquiring 1,400 average MW by 2021, 3,000 aMW by 2026, and 4,300 aMW by 2035. Electric: Targets average ~0.94% incremental electricity savings per year. Natural gas: HB 1257 (2019) establishes a natural gas conservation standard requiring each gas company to acquire all conservation measures that are available and cost effective. Each company must set an acquisition target every two years, with initial targets taking effect by 2022. All cost-effective conservation requirement.	0.9%	Binding	Ballot Initiative I-937 Energy Independence Act, ch. 19.285.040 WAC 480-109-100 WAC 194-37 Seventh Northwest Power Plan (adopted 2/10/16) Washington Department of Commerce 2019 Biennial Report	1.0
Wisconsin 2011 Legislative Electric and nat. gas Statewide goal (100%)	Four-year goal for 2019–22 of 224,666,366 total net life-cycle MMBtus (combined electric and natural gas). Energy efficiency measures may not exceed an established cost cap. Electric: Minimum electric net life-cycle savings target of 22,832 GWh for 2019–22 or 1,840 GWh first-year savings across 2019–22. This translates to roughly 0.6–0.7% of sales per year in 2019–22. Natural gas: Focus on Energy targets minimum net life-cycle natural gas savings goal of 1,243 MMTherms for measures implemented in 2019–22, or 95.9 MMTherms of first-year savings, equating to approximately 0.6% savings as a percentage of sales on a net basis.	0.7%	Cost cap	2005 Wisconsin Act 141 Order, Docket 5-FE-100: Focus on Energy Revised Goals and Renewable Loan Fund (10/15) PSCW Memorandum, Docket 5-FE-101 (5/18) PSCW Decision, Docket 5-FE-101 (6/18)	1.0

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
Nevada	-	$103.83	-
New Hampshire	-	$110.18	-
New Jersey	-	$166.78	-

State	EV fee	Average gasoline tax collected for gasoline vehicles	Ratio of EV fee to gas tax revenues
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 2020

Appendix F: Public EV Charging Stations

State	Number of public EV charging stations	2019 population	Stations per 100,000 people
Vermont	217	623,989	34.78
District of Columbia	147	705,749	20.83
Hawaii	273	1,415,872	19.28
California	6,177	39,512,223	15.63
Colorado	899	5,758,736	15.61
Oregon	606	4,217,737	14.37
Washington	1,008	7,614,893	13.24
Massachusetts	860	6,892,503	12.48
Rhode Island	129	1,059,361	12.18
Maryland	709	6,045,680	11.73
Maine	154	1,344,212	11.46
Utah	361	3,205,958	11.26
Connecticut	340	3,565,287	9.54
New York	1,605	19,453,561	8.25
Georgia	847	10,617,423	7.98
Virginia	610	8,535,519	7.15
New Hampshire	94	1,359,711	6.91
Kansas	200	2,913,314	6.87
Nevada	208	3,080,156	6.75
Missouri	410	6,137,428	6.68
Florida	1,346	21,477,737	6.27
Wyoming	36	578,759	6.22
North Carolina	642	10,488,084	6.12
Arizona	444	7,278,717	6.10
Tennessee	400	6,829,174	5.86
Minnesota	321	5,639,632	5.69
Delaware	53	973,764	5.44
Oklahoma	212	3,956,971	5.36
Illinois	612	12,671,821	4.83
Pennsylvania	592	12,801,989	4.62
Nebraska	89	1,934,408	4.60
Iowa	138	3,155,070	4.37

State	Number of public EV charging stations	2019 population	Stations per 100,000 people
Ohio	511	11,689,100	4.37
South Carolina	223	5,148,714	4.33
New Jersey	376	8,882,190	4.23
Texas	1,227	28,995,881	4.23
Michigan	411	9,986,857	4.12
Wisconsin	222	5,822,434	3.81
North Dakota	29	762,062	3.81
New Mexico	77	2,096,829	3.67
Idaho	63	1,787,065	3.53
Montana	37	1,068,778	3.46
West Virginia	61	1,792,147	3.40
Kentucky	138	4,467,673	3.09
South Dakota	27	884,659	3.05
Alaska	22	731,545	3.01
Indiana	190	6,732,219	2.82
Arkansas	84	3,017,804	2.78
Alabama	135	4,903,185	2.75
Mississippi	69	2,976,149	2.32
Louisiana	94	4,648,794	2.02

Appendix G. Tax 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	Connecticut's Hydrogen and Electric Automobile Purchase Rebate Program provides as much as $3,000 for the incremental cost of the purchase of a hydrogen fuel cell electric vehicle, an all-electric vehicle, or a plug-in hybrid EV. Rebates are calculated on the basis of battery capacity. Vehicles with a battery capacity of 18 kWh or more earn $3,000, while those with capacities between 7 kWh and 18 kWh earn $1,500. Vehicles with batteries smaller than 7 kWh are eligible for a rebate of $750.
Delaware	As part of the Delaware Clean Transportation Incentive Program, the following rebates are available: • $3,500 for battery EVs under $60,000 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.
Louisiana	Louisiana offers an income tax credit equivalent to 50% of the incremental cost of purchasing an EV under the state's alternative-fuel vehicle tax credit program. Alternatively, taxpayers may claim the lesser of 10% of the total cost of the vehicle or $3,000.
Maine	Maine is preparing to offer 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.
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.

State	Tax incentive
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.
Oklahoma	Oklahoma offers income tax credits of up to $50,000 for the purchase of electric vehicles. Credit amounts are determined by the gross vehicle weight rating of the vehicle.
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.
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 are 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.
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 2020a

Appendix H. State Transit Funding

State	FY 2018 funding	2018 population*	Per capita transit expenditure
Massachusetts	$2,105,381,276	6,882,635	$305.90
New York	$5,222,193,300	19,530,351	$267.39
Alaska	$181,178,229	735,139	$246.45
Connecticut	$651,477,883	3,571,520	$182.41
Illinois	$2,302,779,973	12,723,071	$180.99
Maryland	$1,032,129,469	6,035,802	$171.00
Pennsylvania	$1,689,999,183	12,800,922	$132.02
District of Columbia	$564,610,302	5,000,000	$112.92
Delaware	$102,177,731	965,479	$105.83
Minnesota	$493,700,000	5,606,249	$88.06
California	$2,635,079,270	39,461,588	$66.78
Rhode Island	$58,441,037	1,058,287	$55.22
Virginia	$454,232,979	8,501,286	$53.43
New Jersey	$389,474,344	8,886,025	$43.83
Michigan	$307,190,392	9,984,072	$30.77
Wisconsin	$113,487,500	5,807,406	$19.54
Florida	$375,809,491	21,244,317	$17.69
Washington	$106,996,000	7,523,869	$14.22
Vermont	$7,955,199	624,358	$12.74
Indiana	$65,288,653	6,695,497	$9.75
North Carolina	$93,943,490	10,381,615	$9.05
Tennessee	$56,040,141	6,771,631	$8.28
Oregon	$29,158,082	4,181,886	$6.97
Iowa	$15,932,516	3,148,618	$5.06
North Dakota	$3,831,141	758,080	$5.05
Kansas	$11,000,000	2,911,359	$3.78
Nebraska	$6,297,705	1,925,614	$3.27
Wyoming	$1,718,187	577,601	$2.97
New Mexico	$5,700,000	2,092,741	$2.72
Colorado	$15,000,000	5,691,287	$2.64
Arizona	$11,652,906	7,158,024	$1.63
Georgia	$16,000,744	10,511,131	$1.52
Oklahoma	$5,750,000	3,940,235	$1.46

West Virginia	$2,262,989	1,804,291	$1.25
Texas	$34,991,068	28,628,666	$1.22
South Carolina	$6,000,000	5,084,156	$1.18
Arkansas	$3,526,664	3,009,733	$1.17
Maine	$1,540,322	1,339,057	$1.15
South Dakota	$1,000,000	878,698	$1.14
Louisiana	$4,955,000	4,659,690	$1.06
New Hampshire	$1,353,603	1,353,465	$1.00
Montana	$825,000	1,060,665	$0.78
Ohio	$6,500,000	11,676,341	$0.56
Mississippi	$1,600,000	2,981,020	$0.54
Kentucky	$1,845,949	4,461,153	$0.41
Missouri	$1,710,875	6,121,623	$0.28
Idaho	$312,000	1,750,536	$0.18
Alabama	$0	4,887,681	$0.00
Hawaii	$0	1,420,593	$0.00
Nevada	$0	3,027,341	$0.00

* Population figures represent total area served by transit system. *Source:* AASHTO 2019.

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

State	Description	Source
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 six counties within the state may take advantage of this legislation.	legiscan.com/IN/text/HB1011/id/673339
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

State	Description	Source
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
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. State Progress toward Public Building Energy Benchmarking

State	Percentage benchmarked/Progress status
California	100% of state-owned, executive branch facilities, benchmarked since 2013
Connecticut	42% of state buildings, 100% of the Connecticut Technical High School system, 100% of several K–12 school districts, 100% of Connecticut Community Colleges
Delaware	80%
District of Columbia	Nearly 99% of government-owned floor area
Florida	20% of state-owned or leased facilities with more than 5,000 square feet of air-conditioned space
Hawaii	More than 29 million square feet of public facilities
Iowa	80,2 million square feet benchmarked; 1,572 sites and 2,148 buildings benchmarked in the Iowa B3 Benchmarking Program
Kentucky	801 buildings, representing more than 16 million square feet of facilities
Maryland	100% of state facilities
Massachusetts	100% of about 80 million square feet of state-owned facilities
Michigan	88% of state-owned facilities
Minnesota	More than 7,500 public buildings with more than 300 million square feet, representing 22 state agencies, 410 cities, 55 counties, 60 higher-education campuses, and 214 school districts
Mississippi	95% of agencies covered by the energy and cost data reporting requirements under the Mississippi Energy Sustainability and Development Act of 2013
Missouri	Approximately 50% of square footage managed by the Office of Administration and the Department of Corrections
Montana	63.6%
Nevada	86% of total state building square footage
New Hampshire	95% of state-owned building square footage
New Mexico	Approximately 20%
North Carolina	100% of state-owned buildings and community college buildings
Oregon	100% of state-owned and occupied buildings greater than 5,000 square feet
Rhode Island	100% of all state, municipal, and public-school square footage
South Carolina	100% of state-owned buildings
Tennessee	100% of state-owned and -managed facilities
Utah	75% of buildings managed by the Division of Facilities Construction and Management
Vermont	70% of the state-owned and -operated building space that the ENERGY STAR® Portfolio Manager is capable of benchmarking
Washington	55% of state agency square footage, 30% of college square footage, 17% of university square footage

Not all states with benchmarking requirements provided the percentage of buildings benchmarked. All states listed above, except Missouri, require benchmarking in public facilities. Missouri has a voluntary program.

Appendix K. State Energy Savings Performance Contracting: Investments and Savings

State	2019 investments ($ million)	2019 incremental electricity savings for all active ESCO projects	2019 annual savings from active projects
California	$14	6 million kWh	57 million kWh
Colorado	$28.7	23,203,131 kWh	
Maryland		$3,206,939 in savings once commissioning occurs	1,209,328 MMBtus
Massachusetts	$20.8		
Montana	$7.2	3,066,183 kWh	3,340,534 kWh (2017, 2018, and 2019)
New Mexico	$12.4	39,638,521 kWh	115,472,641 kWh
North Carolina	$22.9		$2,000,451 in guaranteed savings
Pennsylvania	$5.8	3,218,886 kWh	5,145,593 kWh
Utah	$4.6		3,830,885 kWh (expected)
Virginia	$53.5	1,100,000 kWh	18,200,000 kWh
Washington	$38.9	10,307,113 kWh	477,383,938 kWh

We excluded ESPC program budgets and projected energy and cost savings from states in order to focus on investments and cost and energy savings already achieved. This table includes only data that were provided by states in response to our data request.

Appendix L. 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
Alabama	AlabamaSAVES Revolving Loan Program	State Energy Office	1,000,000 kWh (construction on project in 2020)	$50,000 (construction on project in 2020)	
Alabama	Energy Efficient Retrofit Program	State Energy Office	694,000 kWh (FY 19 annual savings)	$100,502 (FY 19 annual savings)	491 metric tons
California	Energy Conservation Assistance Act	California Energy Commission		$1,053,808 (CY 2019)	
California	Energy Conservation Assistance Act—Education Subaccount	California Energy Commission		$1,628,677 (CY 2019)	
California	Property Assessed Clean Energy (PACE) Loss Reserve Program	California Alternative Energy and Advanced Transportation Financing Authority	1.1 billion kWh per year (estimated, based on PACE financings enrolled as of October 2019)		
Colorado	Agricultural Energy Efficiency Program	Colorado Energy Office	2.6 million kWh (estimated) to date		
Colorado	Energy Savings for Schools	Colorado Energy Office	3.5 million kWh (estimated) to date		
Colorado	C-PACE: Colorado Commercial Property Assessed Clean Energy	Sustainable Real Estate Solutions	54.5 million kBtus annually (projected)	$29.5 million (projected) to date	
Delaware	Energy Efficiency Investment Fund Rebates	Department of Natural Resources and Environmental Control	12,505,366 (2019 net savings)		7,479.55 tons
Delaware	Energize Delaware Farm Program	Sustainable Energy Utility	747,094 (2019 net savings)		853.2 tons
Delaware	State Revolving Loan Fund	Department of Natural Resources and Environmental Control	343,103 (2019 net savings)		278.85 tons

State	Title	Program administrator	Program-level energy savings	Program-level monetary savings	Estimated avoided CO_2 emissions
Iowa	Energy Bank Revolving Loan Program	Iowa Area Development Group	127,593 kWh (2019)	$10,207 (2019)	97 tons (2019)
Maine	Efficiency Maine Consumer Products Program	Efficiency Maine Trust	67,811.3 MMBtus (FY 2019)	$777,061	
Maine	Efficiency Maine Home Energy Savings Program	Efficiency Maine Trust	1,327,410 MMBtus (FY 2019)	$11,187,676	
Maine	Efficiency Maine Low-Income Initiatives	Efficiency Maine Trust	485,606 MMBtus (FY 2019)	$6,289,344	
Maine	Efficiency Maine C&I Prescriptive Program	Efficiency Maine Trust	946,449 MMBtus (FY 2019)	$9,165,825	
Maine	Efficiency Maine C&I Custom Program	Efficiency Maine Trust	1,780,153 MMBtus (FY 2019)	$9,354,773	
Maryland	Be SMART Home Efficiency Loan Program	Maryland Department of Housing and Community Development	Anticipated energy savings of 126,551 kWh/year (FY 2020)	Anticipated monetary savings of $28,593 (FY 2020)	
Massachusetts	Home Energy Market Value Performance Program (Home MVP)	Department of Energy Resources	4,578,063/year as of May 2020		1,799.8 metric tons/year as of May 2020
Massachusetts	Rapid LED Streetlight Conversion Grant Program	Metropolitan Area Planning Council	33,917 kWh		10,122 metric tons as of June 2020
Montana	Alternative Energy Revolving Loan Program	Montana Department of Environmental Quality	499,653 kWh	$54,444	649,549 pounds (2020)
Nebraska	Dollar and Energy Savings Loans	Nebraska Department of Environment and Energy		$1,154,980 (2019)	
New Mexico	Sustainable Building Tax Credit (personal)	State Energy Office	16,776,195 source energy for 2019	$845,962 from 2019 projects	3,347 tons
New York	Low-Rise Residential New Construction Program	NYSERDA	98,000 kWh/most recent year		

State	Title	Program administrator	Program-level energy savings	Program-level monetary savings	Estimated avoided CO_2 emissions
North Dakota	Energy Conservation Grant	Department of Commerce		Estimated $269,110 (July 2019 to June 2020)	
Oregon	Industrial Self-Direct of Public Purpose Funds	Oregon Department of Energy	1,634,309 kWh (2019)	$103,578 (2019)	599.8 $MTCO_2e$ (2019)
Rhode Island	Pascoag Utility District Energy Efficiency Program	Office of Energy Resources, Pascoag Utility District	262,000 kWh	$24,906	53.60 short tons in 2020
Tennessee	Energy Efficient Schools Initiative—Loans	Energy Efficient Schools Initiative	15,037,512 kWh (FY 2019)	$28 million	10,632 metric tons per year
Tennessee	Pathway Energy Efficiency and Renewable Energy Loan Program	Pathway Lending	14,603,160 kWh from 2019 loans	Average estimated annual energy savings of $37,365 per program participant for program year 2019	10,325 metric tons per year

Appendix M. 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.
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. Also, as part of the performance management incentive (PMI) calculation, the utilities are required to spend at least 95% of their low-income budget. Electric, natural gas, oil, and propane savings metrics also fall under the low-income program attached to the PMI calculation.
Delaware	Delaware established legislative energy savings targets in 2009 with the adoption of SB 106. The legislation 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. To make low-income energy efficiency programs more accessible, a Guidance Document was drafted in 2016 as part of the merger settlement approved by the PSC between Exelon and Delmarva Power and Light to allocate $4 million of the funds toward low-income customer energy efficiency programs. This Guidance Document applies to DPL customers, and funds are available to support organizations delivering energy efficiency programs to low-income ratepayers. Organizations that receive grants to run low-income energy efficiency programs will increase energy efficiency measures for low-income Delaware households, increase statewide electric and gas savings, engage and inform low-income households about the benefits of energy efficiency, develop a community-based approach to address energy efficiency issues in low-income housing by mobilizing public and private-sector resources, and ensure to the greatest extent feasible that job training, employment, and contracting generated by this grant will be directed to low-income persons. All settlement-funded low-income programs must be officially recommended by the Energy Efficiency Advisory Council (EEAC) and approved by the PSC.
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 amount of $3 million annually." For the 2017–21 program cycle the low-income spending requirement was adjusted to 20% of expenditures.

State	Spending/savings requirements for low-income energy efficiency programs
Illinois	In December 2016, the Illinois State Legislature passed the Future Energy Jobs Bill (SB 2814). The legislation directs utilities to implement low-income energy efficiency measures of no less than $25 million per year for electric utilities that serve more than 3 million retail customers in the state (ComEd), and no less than $8.35 million per year for electric utilities that serve fewer than 3 million but more than 500,000 retail customers in the state (Ameren).
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."
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 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	Municipal gas and all electric utilities must spend at least 0.2% of their gross operating revenue from residential customers on low-income programs. Legislation in 2013 raised the minimum low-income spending requirement for gas IOUs from 0.2% to 0.4% of their most recent three-year average gross operating revenue from residential customers.

State	Spending/savings requirements for low-income energy efficiency programs
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 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 July 2001 Nevada passed AB 661, which created the Nevada Fund for Energy Assistance and Conservation (FEAC) through a universal energy charge (UEC) assessed on retail customers of the state's regulated electric and gas utilities. Nevada's Energy Assistance Code specifies the UEC is 3.30 mills per therm of natural gas and 0.39 mills per kWh of electricity purchased by these customers. NRS 702.270 requires that 25% of the money in the FEAC be distributed to the Nevada Housing Division for programs of energy conservation, weatherization, and energy efficiency for eligible households. In June 2017, SB 150 was signed into law. It directs the Public Utilities Commission to establish annual energy savings goals for NV Energy and requires utilities to set aside 5% of efficiency program budgets for low-income customers.
New Hampshire	In August 2016 the New Hampshire Public Utilities Commission approved a settlement agreement establishing a statewide energy efficiency resource standard. The agreement provides for an increase in the minimum low-income share of the overall energy efficiency budget from 15.5% to 17%.
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 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 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."

State	Spending/savings requirements for low-income energy efficiency programs
Oregon	Senate Bill 1149, requiring electric industry restructuring for the state's largest investor-owned utilities, was signed into law in July 1999. The law established an annual expenditure by the utilities of 3% of their revenues to fund "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 program.
Pennsylvania	In June 2015, the Pennsylvania Public Utility Commission issued an implementation order for Phase III of the Energy Efficiency and Conservation Program, setting five-year cumulative targets of 5.1 million MWh, equivalent to about 0.77% incremental savings, per year through 2020. The order also requires each utility to obtain a minimum of 5.5% 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 Regional Greenhouse Gas Initiative 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%.
Wisconsin	The Reliability 2000 Law, passed in 1999, created a program for awarding grants to provide assistance to low-income households for weatherization and other energy conservation services, payment of energy bills, and the early identification and prevention of energy crises. The law specifies that 47% of total low-income funds must be dedicated to weatherization. The legislation required the Department of Administration to collect $24 million for low-income public benefits services the first year and to calculate a low-income need target in subsequent years. This low-income need target is based on the estimated number of low-income families (households at or below 150% of the poverty level) multiplied by the estimated need per eligible household.

Appendix N. 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 the 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 EEAC.
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.

State	Special cost-effectiveness provisions for low-income energy efficiency programs
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 low-income weatherization assistance programs (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 whether or not 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, and these 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."
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."

State	Special cost-effectiveness provisions for low-income energy efficiency programs
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-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.

State	Special cost-effectiveness provisions for low-income energy efficiency 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 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.

State	Special cost-effectiveness provisions for low-income energy efficiency programs
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 only need to 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 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.

State	Special cost-effectiveness provisions for low-income energy efficiency 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.