SUPPORTING RURAL COMMUNITIES WITH STATE ENERGY EFFICIENCY POLICY

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Contents

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Executive Summary

KEY FINDINGS

- There are several policy tools available to state legislators, state regulators and policymakers, and statewide energy efficiency program administrators and advocates seeking to deepen energy and bill savings for rural communities.
- Analyzing these policies yields the following recommendations for stimulating energy efficiency programs in rural areas.
    - Use geographic equity-based performance metrics and/or offer incentives to energy efficiency program administrators for reaching rural customers.
    - Design energy savings targets to help munis and co-ops succeed, such as by allowing these utilities to collaboratively administer efficiency programs and meet energy savings targets.
    - Coordinate statewide on rural energy efficiency programs across multiple utilities and program administrators.
    - Measure the rural economic impacts of energy efficiency policies, such as by quantifying job creation and economic output.
    - Improve the energy efficiency of rural homes, and then electrify their heating sources to reduce their dependence on petroleum fuels. Leverage these activities as part of broader state efforts to reduce greenhouse gas emissions and invest in beneficial electrification.
    - Use public dollars to leverage private capital for rural energy efficiency projects.

This report offers policy tools for stakeholders—including state legislators, regulators, and policymakers; statewide energy efficiency program administrators; and advocates—who are working to deepen energy and energy bill savings for rural community members. Although rural communities stand to benefit from energy efficiency programs, they face obstacles to realizing the full potential of such programs. This report identifies policy tools to overcome these obstacles, focusing on state policies that require and/or incentivize energy efficiency programs in rural areas. We discuss several case studies of state policies that stimulate energy efficiency in rural areas, and we offer recommendations for state policymakers, officials, regulators, and their staff. Because efficiency program administration models vary by state, policy approaches may differ. Still, their challenges and strategies can offer lessons for state legislators, regulators, and officials as they develop their own rural-focused efficiency policies.

METHODOLOGY

We identified state policies intended to advance energy efficiency in rural areas.[1] We then distributed questions (via email survey) to state energy offices, public utility commission staff, academic researchers, and advocates to collect additional information on these policies and to solicit additional policy examples. We asked each state contact for details about their policy or policies, as well as any available data on policy performance.

POLICY EXAMPLES

In the following section, we explore seven examples of state policies that advance efficiency in rural areas. We selected these examples due to their focus on rural communities, geographic diversity, variety in choice of policy mechanisms, and availability of impact data.

Vermont Quantifiable Performance Indicators

The Vermont Public Utility Commission (Vermont PUC) requires its statewide energy efficiency utility, Efficiency Vermont, to fairly distribute energy efficiency benefits for electric ratepayers across the state.[2] For the 2018–2019 program period, Efficiency Vermont exceeded its required statewide geographic equity performance target by 57% and met all 12 county-level goals.

Minnesota Conservation Improvement Program

Minnesota requires munis and co-ops to meet energy savings targets. Most of these utilities work toward the targets by participating in municipal power pools and generation and transmission (G&T) co-ops, which collectively manage efficiency programs for customers. In recent history, Minnesota munis and co-ops have usually met or almost met their annual savings targets.

Michigan Clean, Renewable, and Efficient Energy Act

Michigan's 2008 energy efficiency resource standard (EERS) includes munis and co-ops and allows them to collaborate on efficiency program administration and reporting.[3] Over the past five years, most munis and co-ops have met energy savings targets. However, a 2016 EERS policy update extended the targets only through December 2021. After that, the state will no longer require munis and co-ops to administer efficiency programs, but they can offer them voluntarily.

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[1] This project focused on energy efficiency in buildings; it did not explore policies targeting rural transportation efficiency.

[2] By *ratepayers* we are referring to utility customers. Many states fund energy efficiency programs through charges folded into customer rates or displayed as a fee on customer utility bills (Berg et al. 2019).

[3] An EERS is a binding, long-term (at least three years) energy savings goal for utilities and third-party program administrators. These entities achieve energy savings by offering energy efficiency programs to customers. To learn more about state EERS policies, see: www.aceee.org/sites/default/files/state-eers-0519.pdf.

Maine Heat Pump Deployment Target

Maine set a legislative goal to dramatically increase high-efficiency heat pump deployment between 2020 and 2025. Efficiency Maine, the statewide efficiency program administrator, saw customer demand for heat pump rebates grow 30% in FY2019.

Colorado Electric Resource Plan Policy

Tri-State Generation and Transmission (Tri-State) is a wholesale, multistate G&T co-op; it is also the largest G&T co-op in Colorado. The state requires Tri-State to submit an electric resource plan (ERP) to project long-term energy and demand needs and forecast different efficiency investment levels. In 2020, the state's Public Utilities Commission (Colorado PUC) required Tri-State to file its ERP for regulatory approval for the first time. Prior to 2020, the utility did not need this approval to implement its integrated resource plan.

Oregon Public Utility Commission Diversity, Equity, and Inclusion Performance Metrics

Energy Trust of Oregon (ETO) is measuring the success of its energy efficiency programs using several new rural-focused performance metrics. ETO will report on progress toward these metrics for the first time in early 2021.

Nebraska Dollar and Energy Savings Loan Program

The Nebraska Dollar and Energy Savings Loan (DESL) is a revolving loan fund through which the Nebraska Department of Environment and Energy (NDEE) finances energy efficiency projects, renewable energy installations, alternative fuel vehicles, and telecommunications projects across all sectors.[4] In the 30 years that NDEE has administered DESL, it has financed projects in every Nebraska county, with energy efficiency project funding totally nearly $360 million.

RECOMMENDATIONS

Based on our research, we offer the following actionable recommendations for state legislators, regulators, and policymakers.

- Use geographic equity as a metric of success
- Design energy efficiency targets in a way that helps munis and co-ops succeed
- Coordinate statewide on rural energy efficiency programs
- Assess and report on the economic impacts of energy efficiency policies
- Leverage emissions reduction efforts to reduce rural communities' dependence on petroleum fuels
- Use public funds to leverage private dollars

[4] Energy efficiency revolving loan fund (RLF) program administrators loan out a pool of capital; borrowers then repay the loans back into the pool and the funds are re-lent for additional efficiency projects. RLFs are typically operated by state and local governments, utilities, state energy offices, universities, and nonprofits. These entities seed RLFs with ratepayer funds, public dollars, auctions from regional greenhouse gas (GHG) auction revenues, private capital, or bond issuance (ACEEE 2020c).

CONCLUSION

States, utilities, and program administrators can use efficiency programs to offset energy costs for rural community members and keep customer dollars local. State legislators, regulators, and policymakers can use a variety of policy tools to stimulate and guide rural energy efficiency programs.[5] In addition to reducing customer energy costs, states have demonstrated that these policies generate substantial economic benefits for rural communities. As rural communities explore economic recovery strategies to bounce back from COVID-19, policymakers can look to energy efficiency policies as a key tool in their toolkit. By making rural energy efficiency investments, program administrators are bolstering rural economies.

[5] State policies may include an EERS, performance incentives, utility resource planning processes, revolving loan funds, and so on.

Introduction

Many rural and small-town residents are burdened by high energy bills. Rural households spend 40% more than their metropolitan counterparts on their energy bills relative to income (Ross, Drehobl, and Stickles 2018). Energy efficiency is a powerful tool to help alleviate this energy burden for rural residents and make buildings more comfortable and healthier to occupy. Further, lower energy bills can lead to fewer utility shutoffs for customers unable to pay their bills, which benefits both the customers and utilities. Energy efficiency can also spur economic development and create jobs in rural communities. State policies can help rural residents and businesses reduce energy costs, and the savings can be reinvested in local economies.

This report outlines policy tools available to stakeholders—including state legislators, regulators, and policymakers; statewide energy efficiency program administrators; and advocates—to deepen energy savings for rural community members. We define a *rural household* as one located outside of a metropolitan census tract of 50,000 residents or more (Ross, Drehobl, and Stickles 2018). This definition also encompasses many small and medium-sized towns.[6] Figure 1 shows a map of rural census tracts included in ACEEE's rural energy efficiency research.

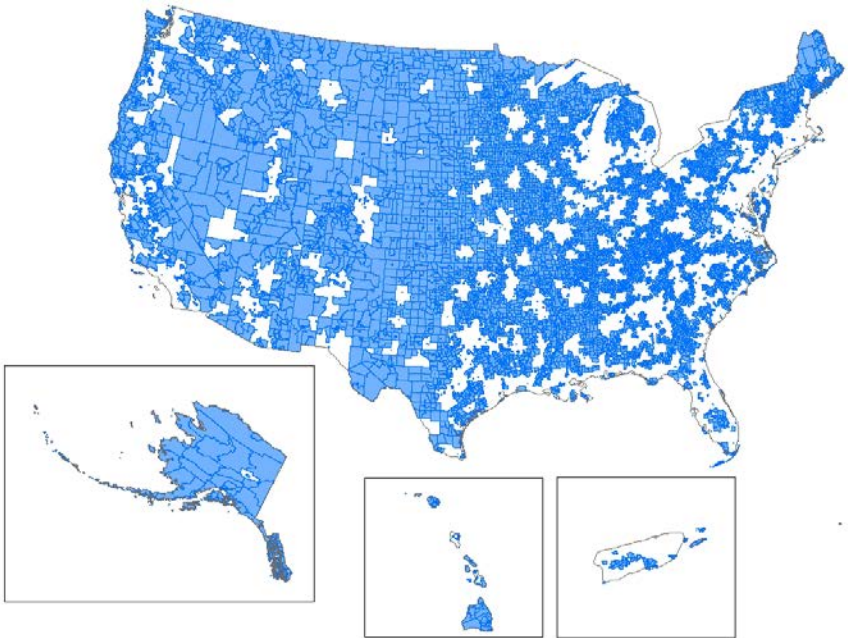

Figure 1. ACEEE's rural energy efficiency research includes rural census tracts depicted in blue. ***Source:*** **Ross, Drehobl, and Stickles 2018.**

[6] This includes census tracts 4–10 in the U.S. Department of Agriculture (USDA) Rural-Urban Commuting Area (RUCA) codes system, which defines codes 1–3 as metropolitan, 4–6 as micropolitan, 7–9 as small town, and 10 as rural. USDA bases RUCA codes on population density, commuting habits, and urbanization, and it updates them in conjunction with the census every 10 years. Metropolitan RUCA codes generally include suburban areas (Frey et al. 2004; Ross, Drehobl, and Stickles 2018).

This report presents several examples of U.S. state policies that stimulate energy efficiency programs for rural homes and businesses. For each example, we describe the state policy, available policy impacts, and policy elements we found notable. Based on these examples, we then offer recommendations for state legislators, regulators, and officials to develop their own rural-focused efficiency policies.

Today, energy efficiency is even more important to rural communities because of the coronavirus (COVID-19) pandemic and associated economic disruptions. Rural communities have been hit hard by COVID-19, and energy efficiency can be an important tool for alleviating rural energy burdens, improving indoor air quality, creating local jobs, and spurring local economies. As state and local governments face the resulting budget shortfalls, they should consider energy efficiency as an opportunity to preserve limited taxpayer resources in the near and long term.

Background

While rural community members stand to benefit from energy efficiency programs, they face challenges in realizing that potential. Rural customers live farther apart and in more remote locations than their urban counterparts, creating challenges both for informing customers about relevant programs and getting contractors to isolated communities to complete efficiency projects. Many rural electric cooperatives (co-ops) and municipal utilities (munis) have fewer staff than utilities serving urban or suburban areas, and they cite difficulties in accessing funds to deliver energy efficiency programs to their members. In 2017, investor-owned utilities (IOUs) served 72% of U.S. electricity customers, but co-ops are more prevalent in rural areas today (EIA 2019). Additionally, most state public utility commissions regulate IOUs but do not regulate munis or co-ops. As a result, these state regulators are unable to use the same efficiency policy tools for munis and co-ops that they use to stimulate efficiency investments from IOUs. Beyond the utility sector, state energy offices, economic development agencies, and departments of agriculture may design or implement their efficiency programs without prioritizing rural community members. However, these state agencies are uniquely positioned to leverage state, federal, and private dollars for rural efficiency programs.

Another challenge facing rural efficiency efforts is that these communities depend more heavily on petroleum fuels (e.g., propane) as their heating source than do urban consumers. These unregulated fuels often are more expensive and burdensome for customers, who often must pay for an entire season's fuel in advance.[7] Heating oil prices fluctuate, however, because competing heating oil suppliers set the price, demand for oil is seasonal, the cost of crude oil (a major determinant of heating oil prices) changes, and it can be costly to deliver fuel to remote locations (EIA 2020a). This challenge also offers opportunities for fuel-switching and electrification programs to reduce customers' dependence on expensive unregulated fuels.

[7] For a comparison of home heating bills by fuel source, see: www.eia.gov/todayinenergy/detail.php?id=37232.

In this report, we identify policy tools to overcome these challenges. We focus on state policies that require and/or incentivize energy efficiency programs. This work builds on previous ACEEE research that studies the severity of rural energy burdens and identifies programmatic solutions to alleviate them for all rural community members. State policies for energy efficiency are established by state legislatures, governors, and utility regulators. Conversely, efficiency programs are administered by utilities, third-party program administrators, statewide program administrators, state energy offices and other state agencies, and nonprofits. State policy can have a sizeable impact on whether—and to what extent—energy efficiency programs are available for the rural customers who need them.

Here, we offer several case studies of state policies that stimulate energy efficiency programs in rural areas as well as recommendations for state policymakers, officials, regulators, and their staff. Because efficiency program administration models vary by state, policy approaches may differ. For example, some states—such as Vermont—appoint a statewide efficiency program administrator, whereas in Minnesota, utilities deliver energy efficiency programs. Given such differences, there may be different pathways to the same end. Likewise, states can enact an energy efficiency resource standard (EERS) to establish energy-saving targets through legislation and/or regulation. A few states, such as Michigan and Minnesota, have applied these standards to co-ops and munis, as well as to IOUs, which often have large rural service areas.

Methodology

We first identified state policies intended to advance energy efficiency in rural areas.[8] We then distributed email questionnaires to several state energy offices, public utility commission staff, academic researchers, and advocates to collect additional information on these policies and solicit additional policy examples. We asked each state contact for the details of the policy or policies in their jurisdiction and any available data on policy performance. Although it was often lacking, we also sought data on the local economic impacts of energy efficiency policies. We supplemented this information by conducting a literature review and interviewing select stakeholders.

Our report is an initial look at state energy efficiency policies for rural communities. Because rural areas are often served by utilities that are not state-regulated, the data are not readily available for an empirical comparison of rural efficiency efforts and impacts in states with and without supportive state policies. Given this gap, our report focuses on providing examples of states with noteworthy policy mechanisms to advance rural energy efficiency.

Policy Examples

In the following section, we explore seven examples of state policies that advance efficiency in rural areas. For each example, we describe the policy design, the documented policy impacts, and notable elements. Table 1 summarizes the examples and shows the percentage

[8] In this project, we focused on energy efficiency in buildings; we did not explore policies targeting rural transportation efficiency.

of each state's population that lives in rural communities. Among states selected for our report, the percentage of population living in rural areas varies from 14% in Colorado to 61% in Vermont. But, as table 1 shows, more than 93% of the land area in our example states is rural (Census Bureau 2019a), which demonstrates that these rural community members are very geographically dispersed.

Table 1. Summary of state policy examples

State	Rural residents by state (%)*	Policy name	Policy type	Responsible entity
Vermont	61%	Quantifiable Performance Indicators (QPIs)	Performance incentive mechanism	Efficiency Vermont
Minnesota	27%	Conservation Improvement Program (CIP)	Energy efficiency resource standard (EERS)	Minnesota investor-owned, cooperative, and municipal utilities
Michigan	25%	Clean, Renewable, and Efficient Energy Act (PA 295)	EERS	Michigan investor-owned, cooperative, and municipal utilities
Maine	61%	An Act to Transform Maine's Heat Pump Market to Advance Economic Security and Climate Objectives (LD 1766)	Heat pump deployment target	Efficiency Maine
Colorado	14%	Electric Resource Planning requirement (SB-19 236)	Long-term energy planning	Tri-State Generation and Transmission (Tri-State)
Oregon	19%	Diversity, equity, and inclusion performance metrics	Performance incentive mechanism	Energy Trust of Oregon (ETO)
Nebraska	27%	Dollar and Energy Saving Loan (DESL) Program	Revolving loan fund	Nebraska Department of Environment and Energy (NDEE)

* *Source:* Census Bureau 2019a

VERMONT QUANTIFIABLE PERFORMANCE INDICATORS

The Vermont Public Utility Commission (Vermont PUC) requires its statewide energy efficiency utility, Efficiency Vermont, to fairly distribute energy efficiency benefits for electric ratepayers across the state. For the 2018–2019 program period, Efficiency Vermont exceeded its required statewide geographic equity performance target by 57% and met all 12 county-level goals.

Background

In 1999, the Vermont Legislature and Vermont PUC created Efficiency Vermont to serve as the statewide energy efficiency utility and energy efficiency program coordinator (Efficiency

Vermont 2020c).[9] A nonprofit called *VEIC* operates Efficiency Vermont to help the state transition to a lower-cost clean energy economy by providing rebates, services, products, and advice for residents and businesses.[10] Similarly, Delaware; Maine; Maryland; Michigan; New Jersey; New York; Oregon; Washington, DC; and Wisconsin use state or third-party program administration models.[11]

For the 2018–2020 performance period, the Vermont PUC has encouraged strong performance from Vermont's Energy Efficiency Utilities by establishing a suite of performance-based targets structured to achieve a wide range of policy objectives. For this performance period, the Vermont PUC approves compensation to VEIC for administering energy efficiency programs based on a set of 19 performance metrics across its electric and thermal-energy-and-process-fuels (TEPF) portfolios.[12]. Collectively, these performance metrics are referred to as *quantitative performance indicators* (QPIs). For example, one electric QPI is a geographic equity minimum performance requirement (MPR), which the Vermont PUC uses to ensure a fair distribution of energy efficiency benefits for electric ratepayers across the state (Vermont PSB 2014). To meet this target, Efficiency Vermont must achieve total resource benefits (TRB) requirements in each of the 12 geographic areas established by the Vermont PUC.[13] Table 2 below summarizes these figures.

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[9] In 2017, the Vermont Public Service Board changed its name to the Vermont Public Utility Commission (AP 2017); here, we refer to the agency as the *Vermont PUC*. The Vermont PUC regulates three efficiency program implementers within the state: Efficiency Vermont, Burlington Electric Department, and Vermont Gas. Efficiency Vermont provides programs and services across two separate—and separately funded—portfolios for Vermont's electric ratepayers (excluding the city of Burlington) and its thermal-energy-and-process-fuels customers, who purchase unregulated fuels. Burlington Electric Department delivers efficiency services to electric ratepayers in Burlington. Vermont Gas delivers efficiency services to regulated fuel natural gas customers. The Vermont Department of Public Service (PSD) is an executive agency charged with representing the public interest on energy, water, wastewater, and telecommunications, including promoting energy efficiency. The PSD is primarily funded through a gross revenue tax on utility bills (Vermont PSD 2020).

[10] The Vermont Energy Investment Corporation recently changed its name to VEIC.

[11] In a third-party or state government program administration model, non-utility organizations—such as state governments or nonprofit organizations—administer energy efficiency programs funded through a dedicated funding stream (e.g., public benefits fees). To learn more about the pros and cons of utility-, state-, and third-party-administered energy efficiency programs, see Sergici and Irwin 2019 and York 2012.

[12] Some of these metrics are performance indicators, meaning that Efficiency Vermont receives a higher monetary performance incentive with better performance. Other metrics are minimum performance requirements (MPRs), whereby Efficiency Vermont will be charged a financial penalty if it fails to achieve the target. The electric portfolio has a total of 14 QPIs, including five performance indicators and nine MPRs. The TEPF portfolio has a total of five QPIs, including two performance indicators and three MPRs (G. Eaton, senior regulatory manager, Efficiency Vermont, pers. comm., September 28, 2020). The Vermont PUC sets QPI targets as part of its Demand Resources Plan (DRP) process and for three-year increments, but the Vermont Department of Public Service evaluates VEIC's progress on an annual basis (Gold et al. 2020).

[13] *TRB* refers to the present dollar value of lifetime benefits from gross electric benefits (energy and demand), water savings, and fuel savings acquired from measures installed during a given reporting period (Efficiency Vermont 2019). Gross savings are those estimated as a direct result of participating in programs and do not account for other effects such as free riders, spillover, and line losses. For more information on Vermont's gross-to-net factors, see Efficiency Vermont 2018.

Vermont has additional programs and policies to support fuel switching and beneficial electrification for its customers—most of whom live in rural areas. For example, Efficiency Vermont offers various rebates, including several for space and water heating heat pump systems, and others for high-efficiency wood stoves and boilers.

While Efficiency Vermont's electric portfolio services are funded by an energy efficiency charge on electric ratepayers, its TEPF portfolio is funded by revenue generated through the Regional Greenhouse Gas Initiative (RGGI) auction funds and revenue from the Independent System Operator of New England (ISO-NE) forward-capacity market (FCM).[14] A portion of the RGGI and FCM revenue generated in the state is directed to support Efficiency Vermont's TEPF energy efficiency portfolio, which includes services for rural households in Vermont.[15] The Vermont Department of Environmental Conservation invests the majority of RGGI proceeds from CO_2 allowances in efficiency programs managed by Efficiency Vermont. Because of these investments, Efficiency Vermont has included TEPF in its energy efficiency programs. The Regional Greenhouse Gas Initiative, Inc. (RGGI, Inc.)— a nonprofit that helps develop and implement RGGI—estimates that the thermal energy and energy efficiency programs funded through 2017 will result in lifetime energy savings of 3.4 million British thermal units (MMBtu). RGGI also estimates that the programs will avoid more than 200,000 short tons of CO_2 and save participants more than $95 million on their energy bills over the lifetime of those investments. RGGI, Inc. also estimated that the Vermont RGGI-funded programs have served 9,950 households and 564 businesses (RGGI, Inc. 2019).

Policy Impacts

Efficiency Vermont exceeded its TRB target in all 12 geographic areas by mid-2020 (Efficiency Vermont 2020b).[16] Table 2 summarizes each county's performance toward the Geographic Equity QPI.[17] In August 2019, the Vermont PUC initiated a Demand Resource

[14] Forward capacity markets are one way that independent system operators (ISOs) can cost effectively meet their region's capacity demand and reliability requirements. For a historical review of energy efficiency in capacity auctions, see Relf and Baatz 2017.

[15] The Regional Greenhouse Gas Initiative (RGGI) is a market-based emissions reduction program through which some states work to reduce carbon dioxide (CO_2) emissions. Those states are Vermont, Rhode Island, New York, New Jersey, New Hampshire, Massachusetts, Maryland, Maine, Delaware, and Connecticut—and soon, Virginia. Each participating state works to meet a CO_2 budget by reducing emissions from fossil-fuel-fired electric power plants and/or purchasing CO_2 allowances in any participating RGGI state. States with extra allowances can auction them, and then reinvest proceeds in energy efficiency and renewable energy programs. Of the 2017 RGGI investments, 51% went to energy efficiency, 14% to clean and renewable energy, 14% to GHG abatement, and 16% to direct bill assistance (RGGI, Inc. 2019).

[16] Efficiency Vermont defines *TRB* as the present dollar value of lifetime benefits from gross electric benefits (energy and demand), water savings, and fuel savings for measures installed during a given reporting period (Efficiency Vermont 2020a).

[17] For the Geographic Equity QPI, the state combines Essex and Orleans Counties as well as Grand Isle and Lamoille Counties, (Vermont PSB 2014).

Plan (DRP) proceeding for Efficiency Vermont for 2021–2023 (Gold et al. 2020; Vermont PSD 2019).

Table 2. Performance toward 2018–2020 Electric Minimum TRB per geographic area as of June 2020 (QPI #10)

Geographic area[1]	Required TRB per geographic area[2]	Period to date TRB per geographic area[3]	% of goal
Addison	$8,560,403	$19,550,332	228%
Bennington	$10,017,250	$16,897,731	169%
Caledonia	$6,857,686	$9,405,584	137%
Chittenden	$49,652,236	$63,868,946	129%
Essex/Orleans	$7,204,954	$13,030,515	181%
Franklin	$14,070,521	$23,989,244	170%
Grand Isle/Lamoille	$7,859,883	$14,937,417	190%
Orange	$5,109,183	$9,131,676	179%
Rutland	$17,017,418	$32,393,991	190%
Washington	$13,534,722	$27,443,588	203%
Windham	$15,170,850	$16,185,286	107%
Windsor	$14,124,738	$18,837,502	133%
Total	$169,179,844	$265,671,812	157%

[1] All geographic names refer to Vermont counties. [2] Essex/Orleans and Grand Isle/Lamoille represent areas in which two counties are combined into one geographic area. Efficiency Vermont adjusted required TRB targets for customer credit.[3] QPIs are for the 2018–2020 performance period. *Source*: Efficiency Vermont 2020b (p. 30).

Notable Policy Elements

Vermont QPI targets include several unique aspects that offer lessons for other states. This policy saves energy in rural communities by using geographic equity as a metric of success and reducing residents' heating fuel use.

USING GEOGRAPHIC EQUITY AS A METRIC OF SUCCESS

The Vermont PUC determines Efficiency Vermont's performance success based on a number of factors, including whether it is equitably serving customers across the state. Vermont regulators designed this performance metric to ensure an equitable distribution of benefits from energy efficiency programs across all Vermont counties. This results-based approach prioritizes portfolio-wide performance and gives Efficiency Vermont the flexibility to determine which efficiency programs to use to reach particular communities.

REDUCING HEATING FUEL USE

Efficiency Vermont leverages RGGI and FCM funds to finance energy efficiency programs that reduce consumers' use of unregulated heating and process fuels. While more than 80% of households that use heating oil for space heating are in the Northeast, more than 80% of households that use propane for heating nationwide are in rural areas (EIA 2011). As

Vermont has demonstrated, leveraging state policy and non-ratepayer funding sources can help reduce rural households' dependence on these expensive fuel sources.

MINNESOTA CONSERVATION IMPROVEMENT PROGRAM

Minnesota requires munis and co-ops to meet energy savings targets. Most of these utilities work toward the targets by participating in municipal power pools and generation and transmission (G&T) co-ops, which collectively manage efficiency programs for customers. In recent history, Minnesota munis and co-ops have usually met or almost met their annual savings targets.

Background

The Minnesota Conservation Improvement Program (CIP) sets energy savings targets for Minnesota electric and natural gas utilities, including 26 rural electric co-ops, 73 small munis, and 3 IOUs (Minnesota DOC 2019). CIP requirements apply to cooperative electric associations providing retail service to more than 5,000 members, municipalities providing electric service to more than 1,000 retail customers, and municipalities with more than 1 billion cubic feet in annual throughput sales to natural gas retail customers (Minnesota Legislature 2018). While CIP began in the 1980s as a spending requirement, the Next Generation Energy Act of 2007 established an EERS, or savings requirement, in Minnesota (Minnesota DOC 2018). CIP requires that IOUs, co-ops, co-op electric associations, and electric munis spend at least 1.5% of gross operating revenues on energy efficiency and save at least 1.5% of annual retail sales from these programs.[18] It also requires gas munis to spend 0.5% of gross operating revenues from gas sales (Minnesota Legislature 2018; Minnesota DOC 2018). Utilities covered by CIP targets can deliver efficiency programs to tribes. Dakota Electric Association, for example, has given rebates to Prairie Island Tribe members (C. Nelson, director of program development, Center for Energy and Environment, pers. comm., October 19, 2020).

To help munis and co-ops pool resources and efficiency program administration responsibilities, CIP allows them to outsource efficiency program coordination to umbrella organizations. These organizations include six municipal power pools and four cooperative utility membership organizations—most of which manage efficiency programs for their members (Minnesota DOC 2019).[19] In a 2019 statewide efficiency potential study, the Minnesota Center for Energy and Environment found that electric co-ops account for 17%

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[18] Each individual utility and association must calculate its energy savings goals based on the most recent three-year weather-normalized average. If they exceed 1.5% in a given year, utilities and their associations may carry forward energy savings to the following three to five calendar years (Minnesota Legislature 2018). While the Minnesota PUC does not regulate most Minnesota co-ops and munis—and therefore cannot penalize them for noncompliance with CIP targets—all utilities covered by CIP have run energy efficiency programs (C. Nelson, Center for Energy and Environment, pers. comm., October 19, 2020).

[19] These organizations encompass 41 of 48 rural electric co-ops and 70 of 118 small municipal electric utilities. Of the munis with CIP requirements, 19 are not members of a power pool association (Minnesota DOC 2019). Shoemaker, Gilleo, and Ferguson 2018 offer a case study on one of these municipal power pools—the Southern Minnesota Municipal Power Agency. See appendices A and B in Minnesota Commerce Department 2019 for electric and gas aggregator membership.

and small munis account for 11% of achievable 2020–2029 electric program potential (Minnesota DOC 2018).[20]

Utilities subject to CIP must regularly submit plans to the Minnesota Department of Commerce. Munis and co-ops submit annual plans that include budgets, energy savings goals, prior year energy savings, and program design updates for the upcoming year. The Department of Commerce can recommend that munis and co-ops make changes to their CIP plans (though it typically does not do so). IOUs file Triennial Plans every three years that must include program portfolio activities, estimated cost effectiveness, budgets, goals, energy savings estimates, and technical assumptions. IOUs also file annual status reports (Minnesota DOC 2018). This reporting structure allows the Department of Commerce to do a more thorough technical and regulatory review of IOUs' proposed CIP plans and can order changes to them (Minnesota DOC 2018).

The Minnesota Legislature's proposed Energy Conservation and Optimization (ECO) Act of 2020 (Senate File 4409/House File 4502) would maintain a 1.5% annual incremental electricity savings target for munis and co-ops covered under the CIP. [21] However, once the covered utilities save 1% of annual retail sales from efficiency measures, they can meet remaining savings with efficient fuel-switching measures (Minnesota Legislature 2020).[22]

Policy Impacts

In recent history, Minnesota co-ops and munis have usually met or almost met their annual savings targets. Between 2008 and 2017, electric co-ops met or exceeded their 1.5% savings target in 4 out of 10 years. In the same timeframe, electric munis met their 1.5% savings target in 5 out of 10 years, while gas munis far exceeded their 0.5% target in all 10 years (see figure 2). Similarly, as figure 3 shows, Minnesota municipal gas utilities met or exceeded their 0.5% gas savings target between 2008 and 2017 (Minnesota DOC 2018).

[20] These numbers are roughly proportional to rural utilities' share of statewide electricity load: 23% for co-ops and 15% for munis (Minnesota DOC 2018).

[21] The ECO Act would raise the annual savings target to 1.75% for IOUs, and the IOUs would not be allowed to count savings from efficient fuel switching.

[22] CIP currently allows utilities to count savings from fuel-saving measures for low-income homes, but the ECO Act would allow efficient fuel switching for all customers (Minnesota Commerce Department 2015). Fuel switching involves the replacement of a cooling or heating appliance or technology with one that uses a different energy source. State policies can help or prohibit fuel-switching activities, so it is important to be aware of your state's fuel-switching policies. To learn more, see Berg and Cooper 2020.

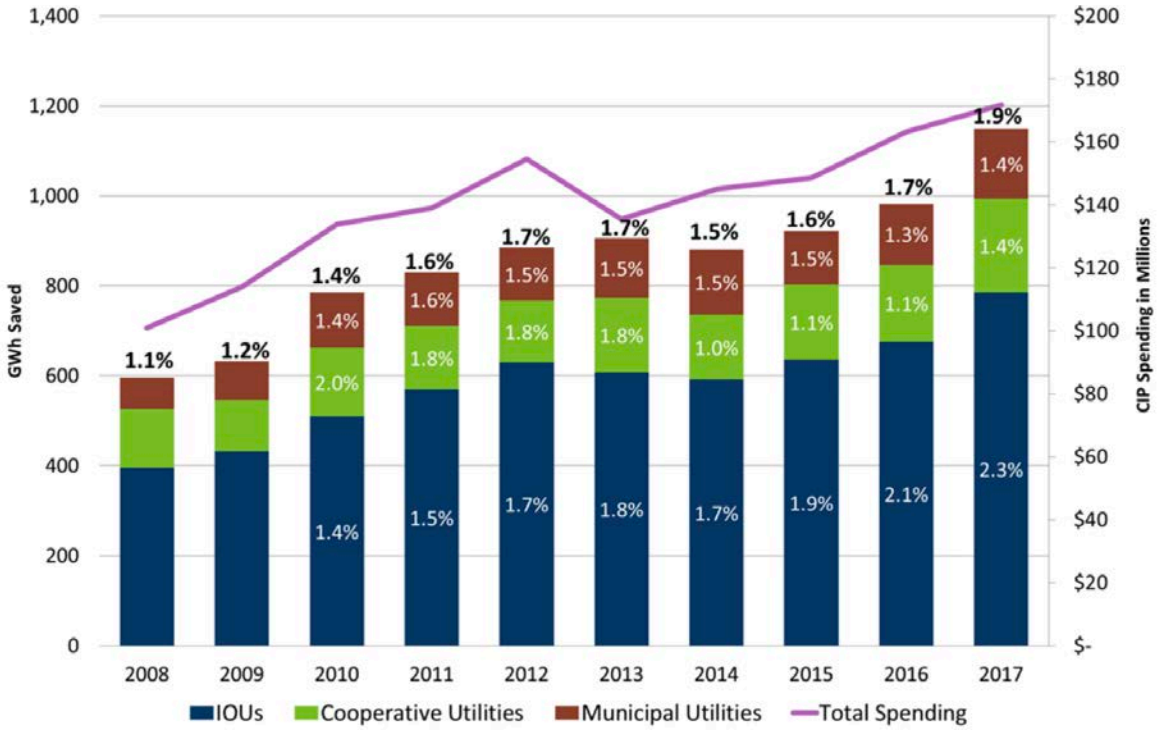

Figure 2. Minnesota electric utilities' 2008–2017 energy efficiency spending and savings achievements (in gigawatt-hours, as a percentage of total sales). Percentage bar labels depict electricity savings relative to retail sales. *Source:* Minnesota DOC 2018.

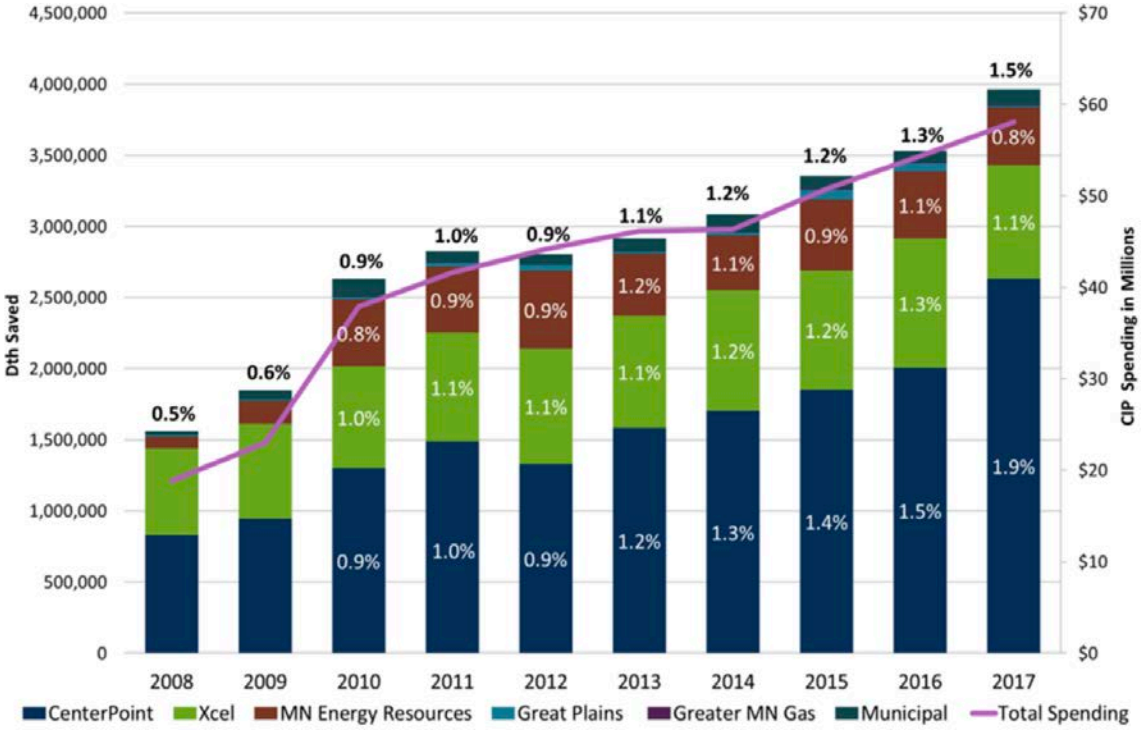

Figure 3. Minnesota natural gas utilities' 2008–2017 energy efficiency spending and savings achievements (in dekatherms and as a percentage of total sales). Percentage bar labels depict gas savings relative to retail sales. *Source:* Minnesota DOC 2018.

The Minnesota Department of Commerce commissioned an economic impact analysis of CIP between 2008 and 2013 and projects economic and energy impacts through 2032. It found that every dollar spent on energy efficiency yields at least $4 in benefits from economic growth, job creation, environmental protection, and reduced utility costs. As table 3 shows, the analysis also found that CIP activities and energy savings stimulated economic growth across several variables (Minnesota Commerce Department 2015). A follow-up report from the Minnesota Department of Commerce found that, between 2016 and 2017, CIP saved Minnesota businesses and residents more than $260 million in energy costs (Minnesota Commerce Department 2019). For context, Minnesota utilities spent $165 million on energy efficiency in 2017 (ACEEE 2019b).

Table 3. Summary of study findings by economic variable for CIP impact

Economic variable	Summary of study finding (2008–2032)
Employment	8,404 direct and 54,777 net job-years
Employee earnings	$1.9–2.2 billion in net employee earnings
Household income and savings	$2.2–2.6 billion in net household income
Business revenue	$4.9–5.9 billion in net revenue and production
Industry production	
Capital investment and innovation	$3–3.6 billion in net profit
State domestic product	
Utility electricity and natural gas rates	CIP would produce only a negligible impact on future rates of approximately $0.000705/kWh and $0.00749/therm due to decreased sales. CIP provides cost-effective total benefits to utilities, program participants, and society.

Source: Adapted from Table ES-5 in Minnesota Commerce Department 2015

Notable Policy Elements

The Minnesota CIP advances rural energy efficiency by setting energy savings targets for munis and co-ops and allowing utilities to work collaboratively to meet those targets.

APPLYING ENERGY EFFICIENCY TARGETS TO CO-OPS AND MUNIS

CIP's application of energy savings targets to most co-ops and munis is critically important for assuring that rural areas can access efficiency programs and services. CIP sets consistent electric savings targets for munis, co-ops, and IOUs at 1.5% of retail electricity sales. This demonstrates that smaller utilities can meet the same targets as larger utilities, relative to individual electricity sales.

COLLABORATING ON EFFICIENCY PROGRAM ADMINISTRATION

CIP allows organizations such as G&T co-op associations, municipal power agencies, and other nonprofit entities to deliver umbrella energy efficiency programs on behalf of the associations, co-ops, and/or munis to which they deliver power. These umbrella organizations also report on spending and savings on an aggregate basis. Many rural co-ops

and munis serve few people, have few sales, and lack the staff and financial resources to implement CIP efficiency programs themselves. A collaborative approach to efficiency program administration helps address this challenge of scale (Minnesota DOC 2019). CIP also allows membership organizations to submit required reports on efficiency activities annually to the Minnesota Department of Commerce—a less stringent reporting requirement than that of Minnesota IOUs.

MICHIGAN CLEAN, RENEWABLE, AND EFFICIENT ENERGY ACT

Michigan includes munis and co-ops in its EERS, which was first enacted in 2008 and allows them to collaborate on efficiency program administration and reporting. Over the past five years, most munis and co-ops have met energy-savings targets. However, an update to the EERS policy in 2016 extended the targets only through December 2021. After that, the state will no longer require munis and co-ops to administer efficiency programs, but they can offer them voluntarily.

Background

In 2008, Michigan established an EERS through the Clean, Renewable, and Efficient Energy Act (PA 295), which requires electric and natural gas utilities to administer energy optimization programs, setting 1% incremental annual savings target for electric utilities between 2012 and 2015 (Michigan Legislature 2008).[23] This law includes electric providers regulated by the Michigan Public Service Commission (Michigan PSC), as well as co-ops and munis. The law includes an annual reporting requirement for munis and co-ops, which must share reports with their governing bodies, send them to member-owners (i.e., customers), make them available at their office, and post them on their website. The report must include energy efficiency expenses made in the past year, estimated future expenses, the number of energy optimization credits that the provider generated during the reporting period, and any other items deemed necessary by the Michigan PSC (Michigan Legislature 2008).[24] PA 295 allows IOUs, munis, and co-ops to either implement their own energy efficiency programs or allocate funds to an independent program administrator. These utilities can collaborate to reach their savings targets, and the Michigan PSC will determine a collaborative's success based on whether it met the average energy-savings targets of participating utilities (Michigan Legislature 2008; K. Gould, manager, Energy Waste Reduction, Michigan Public Service Commission, pers. comm., April 2020).

Muni and co-op involvement in PA 295 will sunset in 2021. In 2016, the Michigan legislature passed PA 342, which maintained energy efficiency requirements for regulated electric and

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[23] In the past decade, Michigan governors have given energy efficiency several different names, including *energy optimization* in PA 295 and *energy waste reduction* in PA 342 (PSC and ACEEE 2019). In PA 342, *energy waste reduction* refers to energy efficiency, load management, and energy conservation. In this report, we focus on energy efficiency and use it to encompass both energy optimization and energy waste reduction.

[24] The Michigan PSC issues one energy optimization credit (EOC) for each MWh of annual energy savings resulting from a utility's energy optimization program. Electric providers may substitute renewable energy credits, advanced cleaner energy credits, or energy use reductions from load management to meet up to 10% of required EOCs.

gas utilities indefinitely. However, PA 342 set a December 31, 2021 expiration date for all such requirements for non-rate-regulated utilities such as co-ops and munis (Michigan Legislature 2016).[25] Moving forward, munis and co-ops could voluntarily continue their efficiency programs, possibly with support from Michigan agencies such as the new Office of Climate and Energy (PSC and ACEEE 2019).

Policy Impacts

In aggregate, IOUs, munis, and co-ops met their energy savings targets every year between 2009 and 2018. (K. Gould, manager, Energy Waste Reduction, Michigan Public Service Commission, pers. comm., April 2020). Figure 4 shows the energy savings for Michigan utilities during this time frame, depicted by absolute energy savings and savings as a percentage of sales.

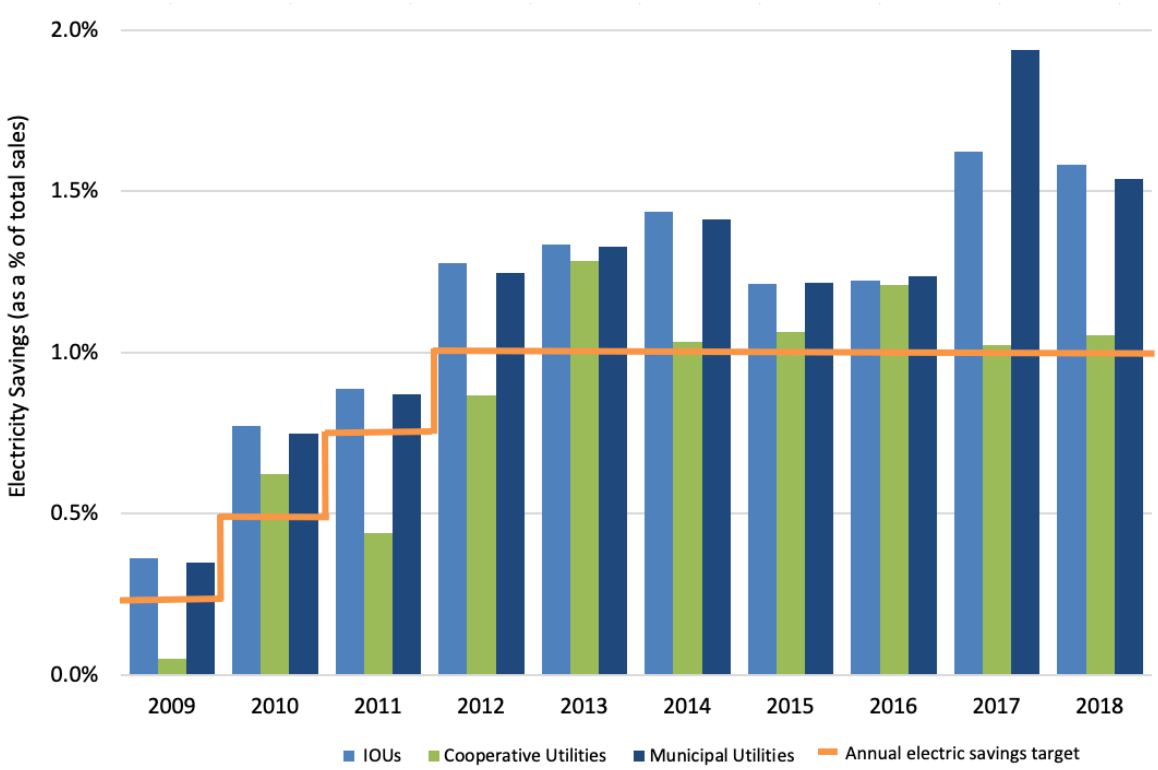

Figure 4. Michigan electric utilities' 2009–2018 energy efficiency savings achievements (in megawatt hours as a percentage of total sales). *Source:* Constructed using data from K. Gould, manager, Energy Waste Reduction, Michigan Public Service Commission, pers. comm., April 2020.

Notable Policy Elements

Michigan PA 295 saves energy in rural communities by including munis and co-ops in energy savings targets and allowing them to aggregate efficiency program administration.

[25] Non-rate-regulated utilities account for approximately 10% of Michigan's electric load (MPSC 2019).

AGGREGATING EFFICIENCY PROGRAM ADMINISTRATION

Including munis and co-ops in PA 295 advanced energy efficiency for rural Michiganders who might otherwise have been unable to access efficiency programs. PA 295 allows IOUs, munis, and co-ops to assign efficiency administration and reporting duties to an association or utility collaborative, such as the Michigan Electric Cooperative Association (MECA), Michigan Community Agency (which is known by its brand name, *Efficiency United*, or EU), or Michigan Municipality Energy Association (MMEA).[26] Some munis and co-ops implement their own programs, while others move in and out of EU, MECA, and MMEA depending on which they think might offer more effective programming (K. Gould, manager, Energy Waste Reduction, Michigan Public Service Commission, pers. comm., April 2020).

These collaborative program administrators help streamline and expand programs across multiple utility service territories (PSC and ACEEE 2019). Additionally, both MECA and EU manage trade ally programs for contractors that deliver their efficiency programs. EU provides participating firms with marketing materials to promote programs (PSC and ACEEE 2019). However, PSC and ACEEE 2019 (in the *Michigan Agriculture and Rural Communities Energy Roadmap*) recommend that EU and the MECA Collaborative coordinate more closely on administering programs and reporting to the Michigan PSC on muni and co-op efficiency performance.

MAINE HEAT PUMP DEPLOYMENT TARGET

Maine set a legislative goal to dramatically increase high-efficiency heat pump deployment between 2020 and 2025. Efficiency Maine, the statewide efficiency program administrator, saw customer demand for heat pump rebates grow 30% in FY2019.

Background

Maine is the U.S. state with the greatest portion of rural residents (61%) and homes heated with fuel oil (62%) (Census Bureau 2019a; EIA 2020b; Winner et al. 2018). Efficiency Maine Trust (EMT) is a quasi-state agency that independently administers energy efficiency and greenhouse gas (GHG) reduction programs in Maine (Efficiency Maine 2019). In 2019, Maine enacted legislation to reduce residents' dependence on fuel oil for heating. Legislative Document (LD) 1766, *An Act to Transform Maine's Heat Pump Market to Advance Economic Security and Climate Objectives,* established the goal to install 100,000 high-performance air-source heat pumps in Maine's residential and nonresidential spaces by 2025 (Maine Legislature 2019). EMT will work to meet this goal through several programs. It offers a high-efficiency ductless heat pump program that gives most residential customers a rebate of up to $1,000 for their first indoor unit and $500 for a second unit. Low-income customers are eligible for higher rebates. Commercial customers are eligible for up to $1,250

[26] The MECA Collaborative is a co-op association that supports its members through policy advocacy, safety trainings, and coordinating professional development programming (MECA n.d.). It also administers energy efficiency programs for 12 muni and co-op members (PSC and ACEEE 2019). EU offers efficiency programs on behalf of 15 electric and natural gas IOUs, munis, and co-ops, and it maintains relationships with a network of contractors and retailers (EU 2020; MECA 2020). MMEA administers programs on behalf of participating munis.

in rebates for units with multiple zones ($500 for the first zone, and $250 for additional zones) (Nadel 2020). The law also allocates payments from the ISO-NE FCM to promote high-performance air-source heat pumps between FY2019 and FY2025. Additionally, the law requires the Maine State Housing Authority to describe how much of its federal Low Income Home Energy Assistance Program (LIHEAP) funding will support this heat pump goal; the Authority must also delineate its implementation strategy and the estimated number of units it will install.[27]

This legislation builds on past EMT efforts to deliver heat pumps to Maine residents. Through its Home Energy Savings Program (HESP), EMT weatherizes single- and multifamily homes and offers incentives to upgrade heating systems. However, the program's success in reaching rural areas is mixed. As figure 5 shows, a greater percentage of households living in more densely populated counties participate in HESP than households living in areas that are more rural. EMT also deploys heat pumps through its Low-Income Initiatives and Commercial and Industrial Prescriptive Program (I. Burnes, program manager of strategic initiatives, Efficiency Maine Trust, pers. comm., September 25, 2020).

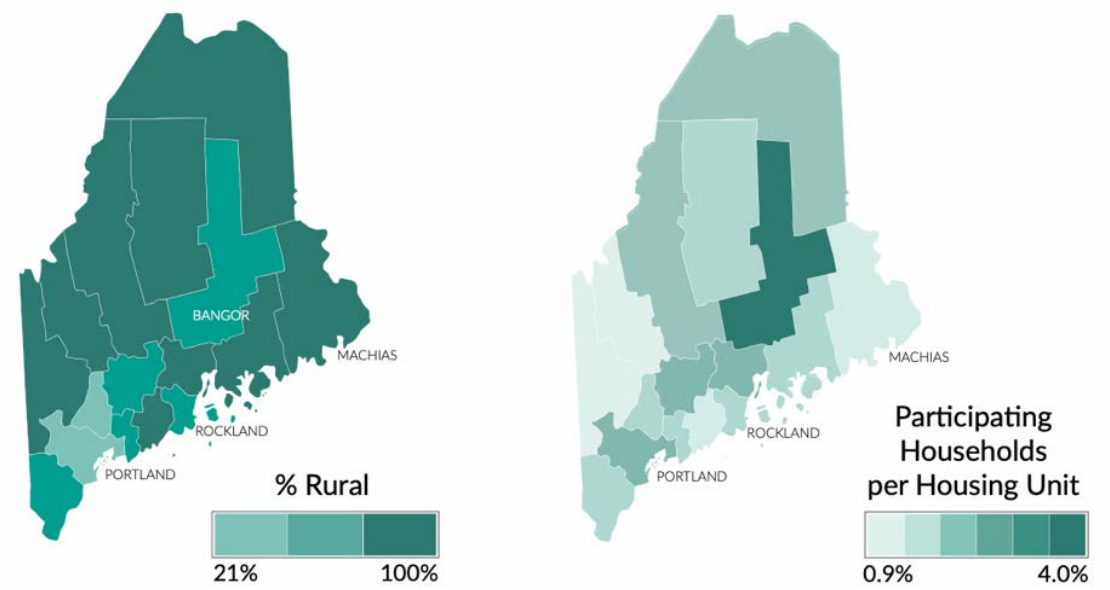

Figure 5. Percentage rural population (left) compared to Efficiency Maine Trust participating households per housing unit by county (right). *Source:* MacDonald et al. 2019.

However, the most recent data on the dollar value of heat pump rebates per household show that many of the towns receiving the most funding per household are in Maine's most rural counties (see figure 6). That is, fewer rural households are participating in the HESP

[27] LIHEAP is a federally funded program through which the U.S. Department of Health and Human Services (HHS) makes annual grants for home energy assistance programs for low-income households. HHS makes grants to all states, tribes, and territories (Perl 2018).

program, but the ones that do participate generally receive larger rebates. This could indicate that, while a smaller percentage of households in rural communities previously participated in the HESP, the more substantial incentives begun in 2020 could be helping to better reach those households.

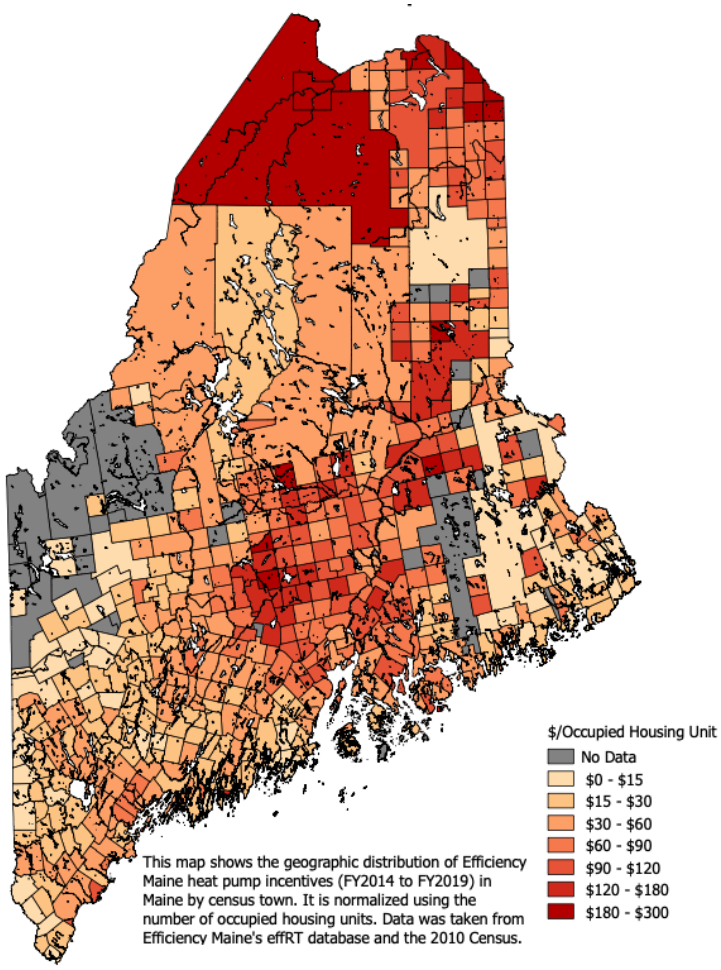

Figure 6. Distribution of heat pump rebates ($ per housing unit). *Source:* Stoddard 2020 and I. Burnes, program manager of strategic initiatives, Efficiency Maine Trust, pers. comm., September 18, 2020.

EMT also leverages RGGI funds to pay for efficiency projects. RGGI, Inc. estimates that efficiency measures funded by RGGI through FY2017 will result in lifetime electricity savings of more than 10,350 megawatt-hours (MWh) and lifetime gas, heating fuel, and process fuel savings of 5.4 million MMBtu. RGGI, Inc. also estimates that RGGI-funded efficiency programs will save participants more than $39 million on their energy bills over the lifetime of these investments (RGGI, Inc. 2019). Through the 2013 Omnibus Energy Bill, Maine enacted statutory requirements that EMT use some RGGI dollars to reduce home heating demand. The law also required Efficiency Maine to achieve heating fuel savings of at least 10% and electricity and natural gas savings of at least 20% by 2020 (Maine Legislature 2013); the state is still working to meet this target. In FY2017, Efficiency Maine directed $3.2 out of $10.7 million in RGGI proceeds toward HESP.

Policy Impacts

Through the HESP, EMT deployed more than 15,500 heat pumps that saved over 5,100 MWh between January 2019 and September 2020 (I. Burnes, program manager of strategic initiatives, Efficiency Maine Trust, pers. comm., September 25, 2020). In FY2019, rebates for EMT's heat pump program grew 30%, likely as a result of increased program outreach to customers. Through its outreach, EMT taught customers how to use their heat pump more effectively and also worked to generate media coverage of the program to increase public awareness (Efficiency Maine 2019). EMT also credits growing heat pump adoption rates to the fact that Mainers are generally aware of hybrid heating systems (i.e., combining heat pumps with fossil fuel backup, particularly on cold days), responsive to unpredictable delivered fuel prices, and drawn to high rebates (Nadel 2020). EMT expects annual heat pump deployment to more than triple by FY2024 (figure 7). To expand beyond the residential market, EMT plans to offer heat pumps in its Small Business Program in FY2021 (Efficiency Maine 2019).

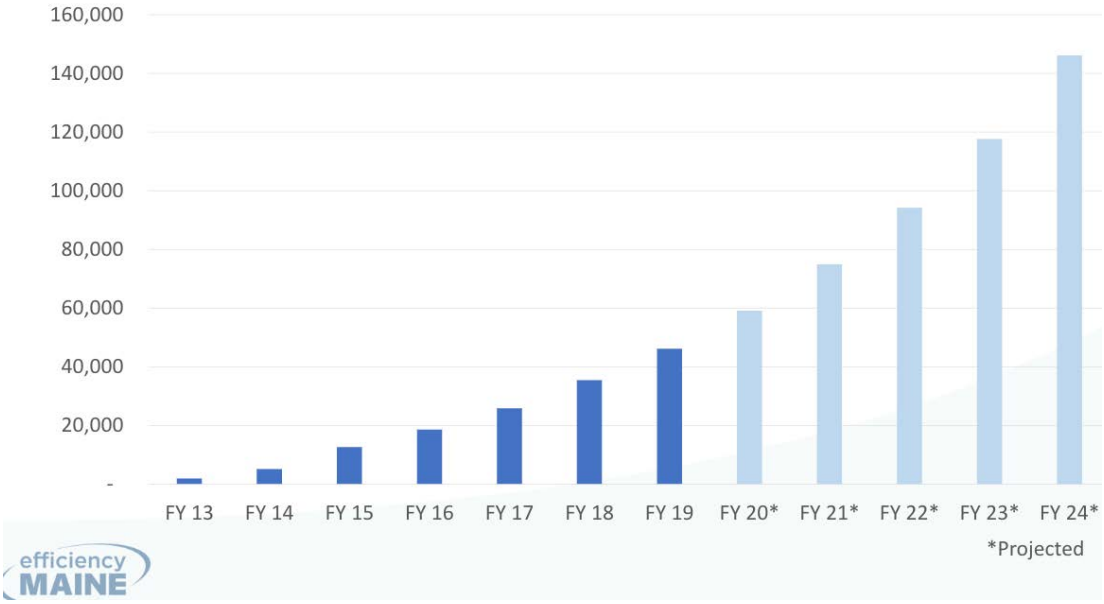

Figure 7. Cumulative trust-funded heat pump installations to meet Maine's goal in Legislative Document 1766. *Source:* Stoddard 2020.

Notable Policy Elements

While Maine's heat pump policy is still in the early stages of implementation, a few notable elements stand out. It aligns with a broader Efficiency Maine focus on delivering energy efficiency to low- and moderate-income households, and it allows the agency to spend program funds on workforce development activities.

FOCUSING ON ENERGY EFFICIENCY IN LOW- TO MODERATE-INCOME HOUSEHOLDS STATEWIDE

EMT deliberately works to bring heat pumps to low-income households. In FY2019, the Affordable Heat Initiative (AHI) incentivized more than 900 high-performance heat pumps, with rebates covering 80% of project costs (Efficiency Maine 2019). EMT offered higher

rebates—up to $2,000 for income-qualified homeowners, compared to $1,500 rebates for other homeowners (Efficiency Maine 2020a, 2020b).[28] This approach aligns with a broader state policy requirement that the EMT target at least 10% of electricity efficiency funds or $2.6 million (whichever is greater) to programs for low-income residential customers (Maine Legislature 2019). A greater portion of rural households (40%) than urban households (30%) live below 200% of the federal poverty level (Ross, Drehobl, and Stickles 2018; Census Bureau 2015). If a utility or efficiency program administrator is already set up to deliver robust programs to low-income households, then they could be well positioned to expand and target these programs to rural households.

FOCUSING ON WORKFORCE DEVELOPMENT

LD 1766 allows EMT to spend program dollars on training and certification activities for energy auditors, mechanical heating system installers, insulation installers, and building energy inspectors (Maine Legislature 2019). In FY2019, EMT conducted webinars on the latest technology developments for contractors; sponsored trainings for heat pump installers; coordinated energy-conservation-related continuing education credits for realtors and other trade professions; and offered certification classes for facility managers (Efficiency Maine 2019). Efficiency program administrators often note a lack of a qualified workforce to deliver their offerings in rural areas (Shoemaker, Gilleo, and Ferguson 2018). However—as EMT demonstrates—utilities and program administrators can strategically train local building performance professionals to deliver their programs.

COLORADO ELECTRIC RESOURCE PLAN POLICY

Tri-State Generation and Transmission (Tri-State) is a wholesale, multistate G&T co-op; it is also the largest G&T co-op in Colorado.[29] The state requires Tri-State to submit an electric resource plan (ERP) to project long-term energy and demand needs and forecast different levels of efficiency investment. In 2020, the state's Public Utilities Commission (PUC) required Tri-State to file its ERP for regulatory approval for the first time (Colorado PUC). Prior to this, it did not require approval of Tri-State's integrated resource plan.

Background

In 2019, Colorado passed Senate Bill 236 (Colorado Revised Statutes § 40-2-134), which required the Colorado PUC to establish rules that direct Tri-State to submit an ERP application to the PUC for approval.[30] In separate legislation that year, Colorado also adopted statewide GHG pollution reduction targets of 26% by 2025, 50% by 2030, and 90%

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[28] To qualify for AHI, Maine homeowners must already receive assistance through LIHEAP or have an assessed home value below EMT-determined county maximums. See Efficiency Maine 2020a for maximum allowable home value for AHI participants by county and additional eligibility criteria.

[29] Tri-State Generation and Transmission is a not-for-profit wholesale electric power supplier that provides power to 43 electric distribution co-op and public power district members. Tri-State's service area covers more than 200,000 square miles across territory in Colorado, New Mexico, Wyoming, and Nebraska (Tri-State 2020a).

[30] Senate Bill 236 also calls for Colorado's two IOUs—Xcel Energy and Black Hills Energy—to file ERPs with clean energy plans to meet these emission reduction and clean energy targets (K. Hay, director of policy, Colorado Energy Office, pers. comm., March 2020).

by 2050 from a 2005 baseline (Colorado General Assembly 2019b). Tri-State has postponed public meetings on its 2020 integrated resource planning (IRP) process due to COVID-19 and is collecting electronic comments from July through September 2020 (Tri-State 2020d). Adopted in April 2020, the rules require Tri-State to submit an assessment of its existing resources by June 1, 2020 and an ERP by December 1, 2020, as well as subsequent plan filings every four years starting June 1, 2023 (Colorado PUC 2020a). Tri-State is now rate-regulated by the Federal Energy Regulatory Commission (FERC) (Tri-State 2020c). However, Colorado electric distribution co-ops exempt themselves from Colorado PUC regulation, as allowed in Colorado Revised Statutes 2019 Title 40 (K. Hay, director of policy, Colorado Energy Office, pers. comm., March 2020). FERC regulates Tri-State's electricity rates across its four-state footprint (Tri-State 2020c), but it does not regulate distribution co-ops served by Tri-State or enforce energy efficiency requirements.

Tri-State must include the following in its ERP: projected resource acquisition needs, annual electric and energy demand, transmission resources, projected emissions in pounds per MWh of air pollutants, and GHGs such as CO_2. The ERP must also include an evaluation of the costs and benefits of early decommissioning and procurement of utility resources to meet the 80% carbon reduction targets by 2030 from 2005 levels (Colorado PUC 2020a). The state's PUC also adopted rules that require its utilities to develop at least three alternative ERPs that estimate the benefits and costs associated with increasing demand-side resources (including energy efficiency), renewable energy resources, and energy storage systems (Colorado PUC 2020b). In late 2019, Tri-State hired an outside consultant to conduct a demand-side management (DSM) and energy efficiency potential study to identify achievable potential and cost savings for Tri-State's ERP process. Tri-State plans to use the study's results alongside input from its member utilities to expand its DSM and efficiency offerings. The study identified significant cost-effective energy efficiency opportunities for Tri-State (Tri-State 2020b). [31] However, it is unclear how extensive a role energy efficiency will play in Tri-State's plans, which are expected to be submitted in December 2020. Generally, ACEEE research shows that efficiency resource standards that set specific energy savings targets are much stronger indicators of efficiency performance than resource planning requirements (Molina and Kushler 2015).

SB 19-236 also includes CO_2 emissions reduction goals, clean energy targets, and energy efficiency requirements. While the bill requires the state's largest IOU to reduce CO_2 emissions 80% by 2030 from 2005 levels, it encourages other utilities—such as Tri-State—to file a Clean Energy Plan (CEP) with the PUC. Pursuant to the statute, a utility with an approved CEP is exempt from additional GHG regulation through 2030. (Colorado General Assembly 2019a). Colorado's CO_2 reduction goals outlined in the policy align with those of the most ambitious states.[32]

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[31] To learn more about the specific energy efficiency opportunities identified in this potential study, see Tri-State 2020b (Appendix C).

[32] Altogether, 23 states have enacted policies for reducing GHGs (C2ES 2020). For example, Governor Kate Brown of Oregon signed Executive Order 20-04 in 2020, which called for GHG reduction goals that were at least

Policy Impacts

Tri-State submitted its first assessment of existing resources to the Colorado PUC on June 1, 2020. Tri-State is required to include energy efficiency in its first ERP, which is due in December 2020; however, COVID-19 has delayed the ERP stakeholder process. As a result, the virtual stakeholder process is ongoing, and it is not yet possible to identity the policy's impacts.

Notable Policy Elements

The Colorado PUC is supporting rural communities with energy efficiency by applying an electric resource planning requirement to Tri-State.

APPLYING AN ELECTRIC RESOURCE PLANNING REQUIREMENT TO A G&T CO-OP

Most states require utilities to project their energy resource needs. To determine least-cost options for meeting future customer energy demand, some utilities that own electricity energy generation assets undergo IRP processes. Utilities should include energy efficiency in these processes in order to lower utility system costs and offset investments in unnecessary generation infrastructure (Relf et al. 2020; Takahashi 2015). The Colorado PUC's application of an ERP regulatory review and approval requirement to a G&T co-op such as Tri-State is unusual since IRP requirements usually apply only to IOUs.

OREGON PUC DIVERSITY, EQUITY, AND INCLUSION PERFORMANCE METRICS

Energy Trust of Oregon (ETO) is measuring the success of its energy efficiency programs using several new rural-focused performance metrics. ETO will report on progress toward these metrics for the first time in early 2021.

Background

ETO delivers energy efficiency programs on behalf of several Oregon electric and gas utilities. The Oregon Public Utility Commission (Oregon PUC) evaluates ETO's performance against a variety of quantifiable performance measures, which ETO regularly reports to the PUC. In 2019, the Oregon PUC approved a new diversity, equity, and inclusion (DEI) quantifiable performance measure for ETO, which focuses its DEI work on three dimensions: race and ethnicity, low-income communities, and rurality. The 2019 Oregon PUC DEI performance measures focus on ETO's efforts to expand participation in its programs, including participation in rural communities (D. Goldberg Menashe, director of legal and human resources, Energy Trust of Oregon, pers. comm., March 2020; Energy Trust of Oregon 2019b). To achieve compliance with the Oregon PUC performance measures, ETO will implement a rural-focused workshop in 2020 (OPUC 2019). As table 4 shows, ETO has identified additional rural energy efficiency-focused goals in its DEI

45% below the state's 1990 levels by 2035, and at least 80% below 1990 levels by 2050 (Oregon Office of the Governor 2020). As another example, in 2019, New Mexico Governor Lujan Grisham signed Executive Order 2019-003, which called for the state to reduce its carbon emissions at least 45% by 2030 from 2005 levels (New Mexico Office of the Governor 2019). That same year, the New Mexico legislature also passed SB 489—the Energy Transition Act—which requires distribution electric co-ops to set a target to achieve the zero-carbon resource standard by 2050 (New Mexico Legislature 2019).

Operations Plan, along with its related activities and definitions of success. ETO also developed several goals around solar deployment in rural communities (although these are not included in the table below).

Table 4. Energy Trust of Oregon's rural energy efficiency-related diversity, equity, and inclusion goals

Goal	Activities	Success looks like
1. Increase customer participation in energy efficiency programs for all underserved populations by 20% for 2017–2020.	Tailor strategies to more effectively reach diverse and rural communities	(see sub-goals below)
1B: Increase participation in Existing Buildings program for small and medium business customers and business customers in rural areas by 20% for 2017–2020.	Focus on smaller office, retail, and restaurants Collaborate with industrial sector Engage culturally specific business organizations Test additional delivery strategies	Completed projects at an additional 21 very rural customer sites per year;* a total of 121 rural projects per year; an annual participation rate of 3.12% (a 20% increase above baseline annual participation rate)
1C: Increase customer participation in Production Efficiency for small and medium businesses in rural territories by 20% for 2017–2020.	Focus cost-effective efforts on specific locations and/or industry types and test customer outreach methods Collaborate with commercial outreach activities Increase diverse trade allies in focus areas	20% participation (82 sites by the end of 2020) Achieve cost-effective customer outreach for small and medium rural customers Exceed goal

* ETO defines "very rural" areas as those with a USDA RUCA code of 10. *Source:* Energy Trust of Oregon 2019b.

Policy Impacts

In 2019, ETO reported that it increased efforts to reach commercial and industrial rural customers in Eastern Oregon by launching a cross-program lighting promotion. It also initiated a targeted incentive and marketing campaign for rural customers in Southern and Eastern Oregon. ETO realized that its limited small business offerings were an obstacle to increasing participation by these customers. It reported that it is unlikely to meet goal 1B (see table 4) and noted an opportunity to improve 2020 participation (Energy Trust of Oregon 2019b). ETO achieved goal 1C by delivering a Production Efficiency program to 619 small and medium business sites through 2019 (up from 413 sites through 2017). Many of these customers were in the indoor agriculture, manufacturing, wood product manufacturing, and winery sectors (Energy Trust of Oregon 2019b).

ETO has assembled a team to plan the rural-focused workshop and has requested guidance from the Oregon PUC on how to adjust the workshop in response to COVID-19. ETO has also identified 15 communities for the workshop based on savings opportunities and other community characteristics (A. Kim, senior utility analyst, Oregon Public Utility Commission, pers. comm., July 2020). ETO will submit a final report to the Oregon PUC on

its progress toward these performance metrics in early 2021. Findings from this workshop will be used to develop future activities and goals.

Notable Elements

The Oregon PUC is advancing rural energy efficiency by using geographic and demographic performance metrics—including program-specific targets—to determine ETO's success.

INCLUDE BOTH GEOGRAPHIC AND DEMOGRAPHIC GOALS IN DEI PERFORMANCE METRICS

ETO takes a multidimensional approach to defining diversity by accounting for community members' race and ethnicity, income level, and location. In doing so, it works to ensure that its energy efficiency programs—and the workers who deliver them—are as diverse and inclusive as possible. For example, ETO is working to recruit more diverse trade allies to deliver its efficiency programs, including those designed for rural small and medium businesses (Energy Trust of Oregon 2019b).

SET PROGRAM-SPECIFIC RURAL PERFORMANCE TARGETS

As table 4 shows, ETO targets underserved customers in a variety of customer segments. Its goals include expanding efficiency offerings for small and medium-sized rural businesses. In this way, it can focus on programmatic considerations unique to specific customer segments.

NEBRASKA DOLLAR AND ENERGY SAVINGS LOAN PROGRAM

The Nebraska Dollar and Energy Savings Loan (DESL) is a revolving loan fund through which the Nebraska Department of Environment and Energy (NDEE) finances energy efficiency projects, renewable energy installations, alternative fueled vehicles, and telecommunications projects across all sectors.[33] NDEE has administered DESL for the past 30 years, financing projects in every Nebraska county. In total, these projects are worth almost $360 million.

Background

The state originally capitalized the DESL program in 1990 with Oil Overcharge Funds and later added funds from the American Recovery and Reinvestment Act (NDEE 2020a).[34] NDEE works with more than 200 Nebraska lending institutions in over 900 locations to offer reduced-interest loans to households, businesses, industrial facilities, and local

[33] Energy efficiency revolving loan fund (RLF) program administrators loan out a pool of capital to which borrowers repay their loans. The fund *revolves* in that the repaid loans are re-lent to additional efficiency projects. RLFs are typically operated by state and local governments, utilities, state energy offices, universities, and nonprofits. These entities seed RLFs with ratepayer funds, public dollars, auctions from regional GHG auction revenues, private capital, or bond issuance (ACEEE 2020c).

[34] Court actions against several oil companies that overcharged their customers during federal oil price controls (1973–1981) resulted in Nebraska receiving oil overcharge funds (also known as *petroleum violation escrow*). Courts ordered the oil companies to distribute this money to states for use in energy efficiency and energy assistance programs. Nebraska received oil overcharge funds from 1982 through 2007; in 2019, NDEE had almost $400,000 in uncommitted oil overcharge funds (NDEE 2020a).

governments. The DESL program also funds alternative fuel and communications projects. As figure 8 shows, more than 90% of DESL program-financed efficiency programs go to Nebraska homes (NDEE 2020a). As borrowers repay loans to the DESL program, NDEE makes funds available for new loans (Gilleo, Stickles, and Kramer 2016).

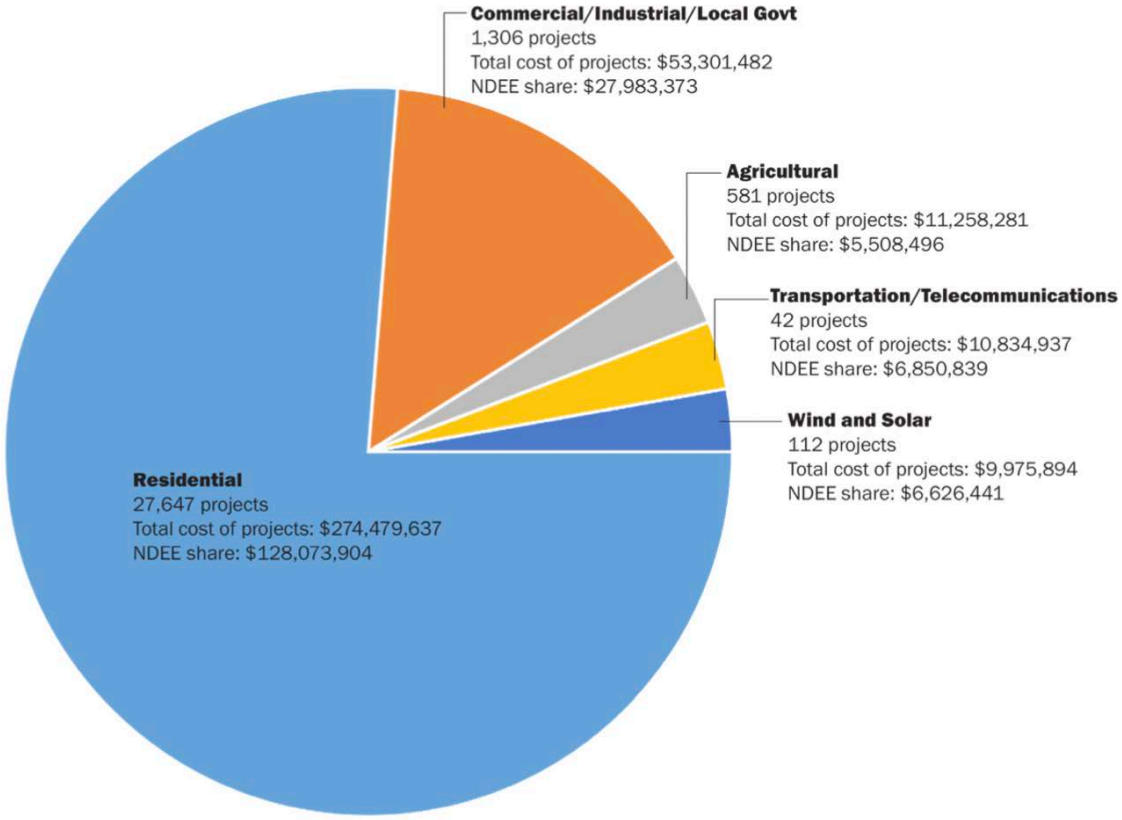

Figure 8. Total DESL funds invested by project category (1990 through June 2019). *Source:* Modified from NDEE 2020a.

Between 2009 and 2010, the Nebraska Public Power District (NPPD)—a wholesale public power provider to munis across the state—contributed $1 million to the DESL program for 1.5% interest loans for retail and wholesale customers to install heat pumps (air source, ground water, or ground coupled heat), eligible thermostats, and high-efficiency natural gas or propane furnaces (NDEE 2020a).

Policy Impacts

As figure 9 shows, NDEE has financed projects in all 93 Nebraska counties.

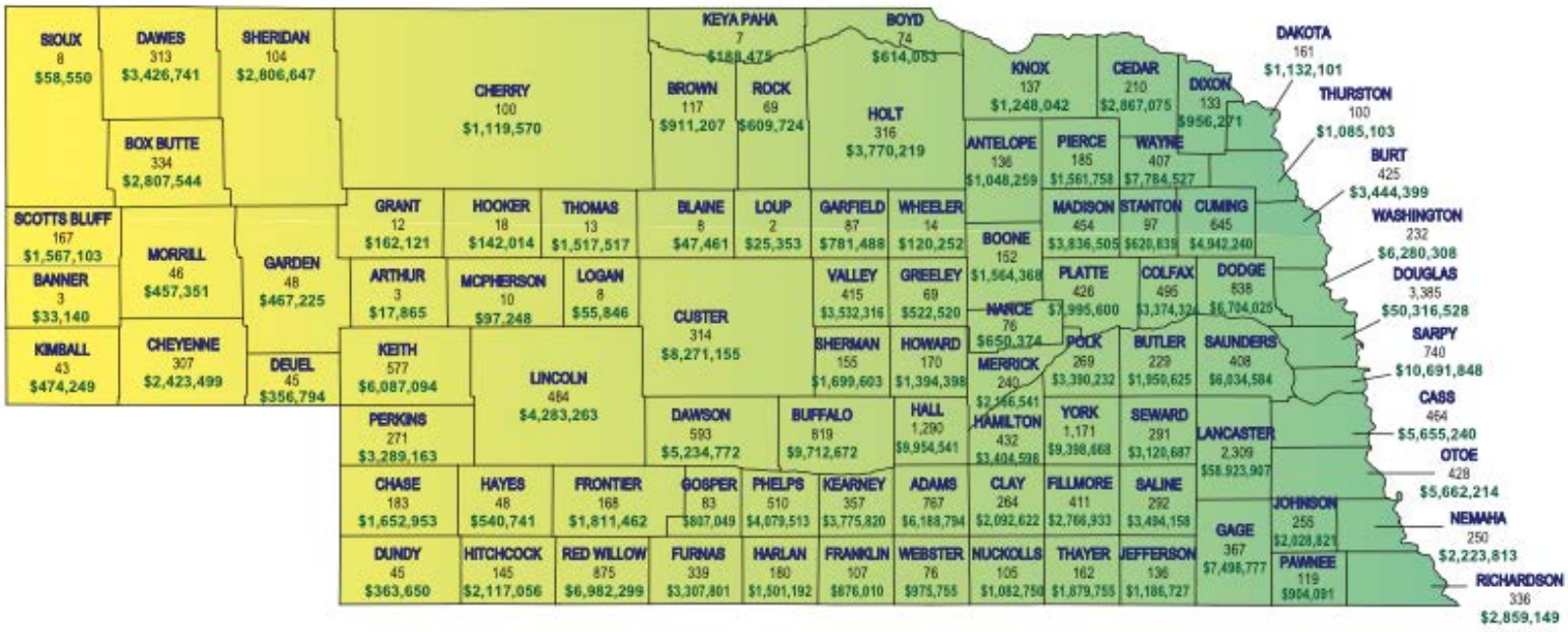

Figure 9. DESL project total by county and the dollar value of projects as of June 2019. *Source:* NDEE 2020a.

Between March 1990 and June 2019, the DESL program financed almost 30,000 energy efficiency projects worth almost $360 million; of this amount, more than $175 million came from NDEE's revolving loan fund. The remaining funds came from participating lenders and borrowers. See table 5 for additional energy and economic impacts from DESL (NDEE 2020a)

Table 5. Residential DESL program impacts (July 2018–July 2019)

Energy impacts	
Electricity savings (kWh)	88,231
Natural gas savings (therms)	49,720
Present discount value of future savings	$990,000

Present day value economic impacts	
Output	$3.5 million
Value-added	$2.1 million
Labor income	$1.5 million
Job-years	40

Source: NDEE 2020a. Includes all DESL loans, including but not limited to those made for energy efficiency projects.

Notable Policy Elements

The NDEE is supporting rural Nebraskans with energy efficiency by offering both public and private financing for energy-saving measures.

LEVERAGING MULTIPLE FUNDING SOURCES

The NDEE purchases about half of DESL program participants' loans with 0% interest to keep loans affordable. A commercial lender purchases the remaining portion of the loan with market-rate interest rates, but the borrower pays an interest rate under 5%, which effectively works as an interest rate buy-down (NDEE 2020b).[35] In 2009, NDEE used additional NPPD public funding for the DESL program. Over the 30-year life of the program, NDEE has contributed $175 million in public dollars to leverage $185 million in private dollars (NDEE 2020a).

Recommendations

Based on our research, we offer the following recommendations for state legislators, regulators, and policymakers.

USE GEOGRAPHIC EQUITY AS A METRIC OF SUCCESS

Because rural community members can be more difficult and expensive to reach with energy efficiency than their metropolitan counterparts, IOUs, statewide efficiency program administrators, munis, and co-ops might easily overlook them. It is important to identify policy solutions that encourage or require these entities to target efficiency in the rural areas

[35] As part of an interest rate buy-down, a third party pays a lender to provide a borrower lower interest rates. NDEE effectively does this through the DESL program (Gilleo, Stickles, and Kramer 2016).

they serve. State regulators can set performance metrics and/or offer incentives for program implementers for delivering efficiency programs to rural customers. Utility performance incentives are already a common policy tool for overall efficiency performance; 36 of the 52 largest U.S. electric utilities are in states with a policy that establishes such incentives (Relf et al. 2020). The PUCs that already offer utility performance incentives for meeting energy efficiency program goals could incorporate a geographic equity metric. The Vermont PUC has done this for Efficiency Vermont, which has demonstrated that it can meet rural-focused performance metrics. Similarly, the OPUC recently set program-specific rural engagement goals. To advance more equitable energy efficiency programs, Oregon's ETO works to meet both demographic and geographic performance metrics. While performance incentives are a common policy tool, additional research is needed to determine the most effective structure for those focusing on geographic equity in states other than Vermont and Oregon.

DESIGN ENERGY EFFICIENCY TARGETS TO HELP MUNIS AND CO-OPS SUCCEED

Energy efficiency targets, or EERS, encourage near- and long-term savings from utilities. On average, states with an EERS policy achieve efficiency savings and spending levels that are more than three times higher than states without an EERS (Molina and Kushler 2015). State regulators and policymakers typically base their targets on analyses of achievable energy savings, while also setting their goals at levels that compel program administrators to achieve higher savings than they might have otherwise (Berg et al. 2019). State regulators and policymakers should establish energy savings targets for munis and co-ops, while also allowing flexibility in how they meet those targets. Both Michigan and Minnesota allow munis and co-ops to either operate their own efficiency programs or work collaboratively with umbrella organizations to administer programs and report on progress. Utilities in both states take both approaches. Michigan, for example, allows distribution co-ops to combine their efficiency targets and work toward the average of those targets (Michigan Legislature 2008). The Minnesota CIP allows power pools and cooperative utility membership organizations to deliver energy efficiency programs on behalf of their member munis. This policy also allows membership organizations to submit required reports on efficiency activities annually to the Minnesota PUC—a less robust and frequent reporting requirement than that of Minnesota IOUs. This flexibility can help minimize the administrative burden on smaller utilities in complying with the EERS policies while still requiring them to report regularly on their progress.

COORDINATE STATEWIDE ON RURAL ENERGY EFFICIENCY PROGRAMS

States and utilities should coordinate statewide on rural energy efficiency programs. By working together, they can both examine the reach of existing energy efficiency programs for rural community members and coordinate programs and expand rural efficiency programs where gaps exist.

States can coordinate statewide efforts to deliver energy efficiency to rural communities under any regulatory framework, whether by providing technical assistance and/or funding across multiple program implementers and utilities, or by serving as a statewide energy efficiency program administrator. Several states successfully coordinate energy efficiency programs across multiple utilities and implementers. For example, in New York and New Jersey, NYSERDA and the New Jersey Clean Energy Program, respectively, offer

statewide low-income programs and coordinate them with utility programs. Likewise, California and Massachusetts program administrators coordinate and offer priority programs statewide, and utilities in each state contribute to program budgets based on established formulas.

We also see coordination within states at a regional level, which can target programs to underserved regions. In the Southern Minnesota Municipal Power Authority's region, for example, a local nonprofit joint-action agency provides energy efficiency programs to residential, commercial, and industrial customers by collaborating with a regional energy efficiency entity (Slipstream) and the University of Minnesota Clean Energy Network Teams (PSC and ACEEE 2019).[36]

Some states have a single, statewide efficiency program administrator—whether an independent entity or a state agency—that delivers programs on behalf of all types of utilities. Several statewide administrators, including Efficiency United in Michigan, Efficiency Vermont, Efficiency Maine, Wisconsin Focus on Energy, and Oregon's ETO, strive to meet rural-focused performance metrics or deliver rural-focused efficiency programs. As a result, rural customers and members of rural IOUs, munis, and co-ops can now access efficiency programs. Small rural utilities vary in their capacity to deliver efficiency programs; selecting one statewide program administrator can enable consistency in efficiency offerings across utility service territories.

ASSESS AND REPORT ON A POLICY'S ECONOMIC IMPACTS

Measuring the economic impacts of a rural-focused energy efficiency policy can help cement its value as a tool for economic development. ACEEE has found that energy efficiency upgrades can alleviate household energy burdens up to 25%, which translates to more than $400 in energy bill savings annually per household (Ross, Drehobl, and Stickles 2018). ACEEE research has also found that if existing weatherization programs targeted common health risks, they could save more than $228 million in health harms—or $2.9 billion over 10 years (Hayes, Kubes, and Gerbode 2020). State policymakers and regulators can conduct or commission such analyses for their policies and programs. In 2012, for example, NDEE worked with the University of Nebraska to analyze the energy, economic, and environmental impacts of its DESL program's residential component and found that it yielded more than $8 million in net economic impacts and 90 job-years of employment between 2009 and 2010 (Rosenbaum et al. 2012). Some economic impact analyses quantify clean energy jobs (including energy efficiency jobs) at the local or state level. For example, the nonprofit Environmental Entrepreneurs (E2) used data from the U.S. Energy Employment Report to quantify clean energy jobs in rural areas and identified the top 10 states for rural clean energy jobs (see table 6).

[36] For a case study of the program, see Appendix A of www.michigan.gov/documents/energy/BaselineReportFinal_668264_7.pdf.

Table 6. Top 10 states for rural clean energy jobs (Q4 2019)

Rank	State	Rural Clean Energy Jobs
1	North Carolina	28,894
2	Michigan	24,954
3	Texas	23,904
4	Wisconsin	19,513
5	Ohio	17,513
6	Indiana	16,009
7	Tennessee	14,725
8	Iowa	14,244
9	Minnesota	13,845
10	Illinois	13,502

*Rural clean energy jobs are calculated based on the Bureau of Labor Statistics' (BLS) nonmetropolitan area for every state, which is any area not designated as a metropolitan area by BLS.[8]

Source: E2 2020. E2 uses the U.S. Bureau of Labor Statistics' definition of *rural*, which includes any area not designated as a metropolitan area.

Among the policies we reviewed here, we found only a few economic impact assessments. As policymakers look to better serve their rural constituents and maximize the economic and workforce development benefits of energy efficiency and clean energy, it will be important for them to collect relevant data and conduct or commission analyses to quantify these benefits. Table 7 offers several approaches for estimating the economic impacts of efficiency programs.

Table 7. Approaches for estimating economic impacts of energy efficiency programs

Tool	Description	Application	Cost	Pros and cons
Adders and multipliers	A simple factor to scale up resource benefits to include or estimate economic development benefits from a given resource benefit amount	Once adder is determined or multiplier is estimated, can be applied to resource benefits estimates using simple arithmetic	Adders: relatively low Multipliers: require some resources to estimate	Pros: simplicity, transparency, and ease of use; relatively low cost Cons: limited accuracy; adders are sometimes set somewhat arbitrarily
Input–output models	A relatively simple model that calculates benefits based on the number of jobs required to sustain a given economic activity or the GDP created by economic activity	Practitioners must input the level of resources being invested and the savings they generate as well as the investment costs and other key parameters	Relatively low	Pros: less expensive and easier to use than other types of models; transparent Cons: limited ability to assess impacts of price changes; often do not assess changes over time
Econometric models	A more complicated model that relates changes in individual sectors and prices to one another and the economy as a whole	Typically requires an experienced modeler to program the efficiency investments and other key parameters	High	Pros: thoroughly represent interactions between sectors and changes over time Cons: expensive; results are heavily influenced by opaque parameters estimated by the modeler
CGE and hybrid models	A typically less-detailed model of the economy with relationships governed by economic theory and estimated parameters	Typically requires an experienced modeler to program efficiency investments and other key parameters	High	Pros: theoretically consistent results; can project long-term impacts; available at state and local levels; hybrid models allow for unexploited efficiency opportunities Cons: results heavily influenced by opaque parameters and assumptions; unavailable at subnational levels; traditional CGE models assume a state of economic equilibrium

Source: ACEEE 2019a

LEVERAGE EMISSIONS REDUCTION TO REDUCE RURAL DEPENDENCE ON PETROLEUM FUELS

Almost half of U.S. states have established GHG emissions reduction targets (C2ES 2020), and the U.S. electric grid is increasingly powered by carbon-free renewables (EIA 2020c). Because energy efficiency is such a cost-effective tool for reducing energy consumption and emissions, it complements this increased investment in renewable energy. As a result, states are increasingly looking to efficiency and beneficial electrification as tools for meeting their GHG reduction targets (Gold, Molina, and Gilleo 2018). States typically do not regulate petroleum fuels used for heating, yet these fuels can account for 16–27% more CO_2 per million BTU than natural gas (EIA 2016). Of the U.S. households using propane heating, 83% are in rural areas that lack a natural gas distribution infrastructure (EIA 2011). Heating with petroleum fuels requires large, upfront payments to refill tanks and sometimes involves refilling them mid-winter when fuel prices can be high. Conversely, monthly electricity billing can help households monitor energy expenditures. Weatherizing households and then electrifying their heating systems can save money and reduce emissions, allowing states and utilities to save energy, offset energy costs, and reduce GHG emissions for rural residents.[37]

To ensure that rural communities benefit from state emissions reduction targets, states and utilities can channel incentives to rural households in order to make their homes more efficient and electrify their heating sources. Efficiency Vermont, for example, uses RGGI proceeds to fund thermal energy and process fuel efficiency programs. Efficiency Maine is using state policy to expand heat pump deployment. States can also design efficiency targets to encourage beneficial electrification by establishing multiple goals—such as an overall goal in BTUs, kilowatt hours (kWh) for electricity goals, therms of natural gas, and a dedicated heat pump deployment goal—and revise fuel switching rules so that participants are encouraged to install heat pumps if doing so will save money and reduce emissions (Gold et al. 2020; Berg and Cooper 2020). As in Minnesota's proposed ECO Act, such steps support both beneficial electrification and energy efficiency.

USE PUBLIC FUNDS TO LEVERAGE PRIVATE DOLLARS

Rural community members often lack access to capital and financing options for energy efficiency projects. To overcome this barrier, state energy offices can use federal, state taxpayer, and ratepayer dollars to leverage private capital for rural energy efficiency projects. Some states, such as Nebraska, use public dollars to stimulate private financing for individual energy efficiency programs. Other states—including Michigan, Colorado, and New York—use green banks to fund projects. However, unless they are motivated by policy, green banks might not reach underserved customer segments such as the multifamily and low-income markets (Gilleo, Stickles, and Kramer 2016). To address this, states can enact complementary policies to simultaneously drive public and private resources to energy efficiency projects for rural community members.

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[37] To learn more about the carbon and economic impacts of electrifying residential water and space heating under different electric rate structures across the United States, see Billimoria, Guccione, and Henchen 2018.

Tariffed on-bill (TOB) financing is another useful tool for delivering both publicly and privately funded efficiency dollars to rural community members. With TOB, utilities issue a tariff (funded through ratepayer dollars or private capital) to households and businesses, which they then repay to utilities through their energy bills (ACEEE 2020b). Co-ops and munis often use TOB to help their members finance efficiency projects. Unregulated utilities in most states already have intrinsic authority to offer TOB programs; as a result, most successful TOB programs today operate without any authorizing state policies (J. Cross, project manager, Environmental and Energy Studies Institute, pers. comm., September 29, 2020). However, some states have passed legislation to expressly authorize unregulated utilities to deliver TOB programs and to provide them guidance for doing so. For example, in 2011, the South Carolina Legislature passed a law to confirm co-ops' ability to finance and deliver energy efficiency to their members (South Carolina Legislature 2020).[38] Similarly, the Virginia legislature passed a law in 2020 that authorized electric co-ops to establish TOB programs and qualify specific energy efficiency measures (Virginia General Assembly 2020).

Conclusion

States, utilities, and program administrators can use efficiency programs to offset energy costs for rural community members and keep customer dollars local. States legislators, regulators, and policymakers can use a variety of policy tools to encourage and guide rural energy efficiency programs—including, but not limited to, EERS policies—performance incentives, utility resource planning processes, and revolving loan funds.

In addition to reducing energy costs, states have demonstrated that such policies are generating substantial economic benefits for rural communities. From Minnesota to Maine and Nebraska to Vermont, energy efficiency policies have yielded tangible benefits. The Minnesota CIP, for example, is expected to produce $2.2–2.6 billion in net household savings statewide between 2008 and 2032. Further, the residential component of Nebraska's DESL yielded more than $8 million in net economic impacts and 90 job-years of employment between 2009 and 2010 (Rosenbaum et al. 2012).

As rural communities explore economic recovery strategies to bounce back from COVID-19, policymakers can look to energy efficiency policies as a key tool in the toolkit. Energy efficiency programs lower costs for rural homes and businesses and create high-quality local jobs. Thus, by enacting policies that drive rural energy efficiency programs, states are both bolstering rural economies and investing in their communities.

[38] To learn more about South Carolina co-ops' successful TOB program, known as *Help My House*, see EESI 2020.

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