Regional Energy Efficiency Database (REED) Supporting Information

March 2023

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About NEEP

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

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

Executive Summary

Since 2011, the Regional Energy Efficiency Database (REED) has been making ratepayer-funded energy efficiency program data readily available from the following Northeast and Mid-Atlantic states and the District of Columbia: Connecticut, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. REED was developed by the Regional Evaluation Measurement & Verification (EM&V) Forum (which has been discontinued) and is based on the Forum's Common Statewide Energy Efficiency Reporting Guidelines, which were adopted in 2010.

REED is a publicly available resource that allows interested parties to access program data and compare the performance of electric and natural gas energy efficiency programs in the region. REED metrics include annual and lifetime energy and demand savings, expenditures, cost of saved energy, avoided air emissions, and job impacts.

Consistent access to this type of data helps states gauge progress towards state and regional energy and demand goals, air quality and greenhouse gas compliance plans, and economic development strategies. REED also allows users to benchmark or compare reported data across states to help identify where program performance may differ from state to state and to help identify program best practices.

This report complements data collected for REED and helps ensure informational transparency. Although some of the energy efficiency program metrics are consistent across the states and the District of Columbia, reporting of energy efficiency program impacts, EM&V practices, and approval processes vary across the region in a number of ways. It is important to consider variations in state practices in the following areas when interpreting REED data:

- Reporting and approval processes
- Tracked versus evaluated savings
- Gross savings adjustments
- Net savings adjustments
- Evaluation, measurement, and verification (EM&V) protocols used

This report highlights some of these differences across states to ensure that REED data are not misconstrued or misrepresented. The report begins with a general supporting information section that provides detailed information on the metrics that REED collects, along with a number of additional resources. Following the general supporting information, this report provides an overview of relevant state program administrators and reporting practices for each REED state and the District of Columbia.

General Supporting Information

This supporting information provides transparency for REED's energy efficiency program data and should be used to help interpret the data. Please see each state's **State Documents and Key Information** section below for additional background on energy efficiency programs, including energy savings adjustments, state review practices, EM&V protocols, and links to supporting documentation.

REED Background and Scope

REED focuses on electric and natural gas energy efficiency savings, impacts, and program expenditures in the Northeast and Mid-Atlantic region, funded by natural gas and electric service ratepayers. Most of the jurisdictions participating in REED were also members of the Regional Evaluation Measurement & Verification (EM&V) Forum, a group NEEP led from 2008 to 2016. REED's scope and reporting framework are based on the EM&V Forum's Common Statewide Energy Efficiency Reporting Guidelines, which the EM&V Forum Steering Committee adopted in 2010. The purpose of the guidelines, and of REED, is to provide a common "currency" of reported energy efficiency data to support multiple state and regional energy and environmental policies and objectives.

REED provides annual energy efficiency program results at the state, sector, administrator, and program levels. It is important to note that energy efficiency program definitions and criteria for including programs in a state's portfolio may vary from state to state, and currently REED includes programs that fall into each state's definition of an energy efficiency program. Below are examples of how several states – two within the REED region, and one outside the REED region – define energy efficiency programs in state statutes. Some states, such as Massachusetts' language regarding natural gas programs, explicitly call out the types of programs that can be included, while others, such as Maine, are less specific and include a list of qualifying program criteria:

- **Massachusetts**: Energy efficiency is a mandate of the Green Communities Act, signed into law in 2008. According to the act, "The department shall require a mandatory charge of 2.5 mills per kilowatt-hour for all consumers, except those served by a municipal lighting plant, to fund energy efficiency programs including, but not limited to, demand side management programs. The programs shall be administered by the electric distribution companies and by municipal aggregators with energy plans certified by the department…the department may approve and fund gas energy efficiency programs proposed by gas distribution companies including, but not limited to, demand side management programs. Energy efficiency activities eligible for funding under this section shall include combined heat and power and geothermal heating and cooling projects. See: Session Law - Acts of 2008 Chapter 169 (malegislature.gov)
- **Minnesota**: "Energy efficiency" means measures or programs, including energy conservation measures or programs, that target consumer behavior, equipment, processes, or devices designed to produce either an absolute decrease in consumption of electric energy or natural gas or a decrease in consumption of electric energy or natural gas on a per unit of production basis without a reduction in the quality or level of service provided to the energy consumer. See: 2014 Minnesota Statutes, 216B.241 Energy Conservation Improvement
- **Maine**: "Conservation programs" means programs developed by the Trust pursuant to 35-A M.R.S.A. § 10110 and this Chapter designed to reduce inefficient electricity use. The Trust shall consider, without limitation, conservation programs that: (a) Increase consumer awareness of cost-effective options for conserving energy; (b) Create more favorable market conditions for the increased use of energy efficient products and services; and (c) Promote sustainable economic development and reduced environmental

damage. (d) Reduce the price of electricity over time for all consumers by achieving reductions in demand for electricity during peak use periods; and (e) Reduce total energy costs for electricity consumers in the State by increasing the efficiency with which electricity is consumed. See: Efficiency Maine Trust Agency Rules, Chapter 3 - INDEPENDENT AGENCIES - REGULATORY (efficiencymaine.com)

Avoided Air Emissions

REED calculates avoided carbon dioxide (CO_2), nitrogen oxides (NOx), and sulfur dioxide (SO_2) emissions based upon annual emission factors for each of the three sub-regions, ISO-NE, NYISO, and PJM (available in the linked documents below). Avoided emissions are calculated for electric programs only.

NEEP chose this methodology for calculating avoided air emissions through a stakeholder-driven process with members of the Regional EM&V Forum when REED was being developed. After extensive discussion, REED subcommittee participants (who were tasked with selecting a methodology for calculating avoided air emissions) concluded that using average annual emissions factors for each of the sub-regions would be a reasonable and straightforward methodological approach. Subcommittee participants discussed the possibility of using marginal emissions factors to calculate avoided air emissions in the future for greater accuracy and consistency. NEEP may shift to use marginal emissions factors to calculate REED's avoided air emissions data in future years, but more research, input and guidance from air regulator stakeholders is needed.

Annual emissions factors used in REED for the program years 2020 and 2021 data are as follows:

Program Year 2020			
	Carbon dioxide (CO_2) lbs/MWh	Nitrogen oxides (NO_x) lbs/MWh	Sulfur dioxide (SO_2) lbs/MWh
ISO-NE	654	0.25	0.04
NYISO	479	0.195	0.082
PJM	791	0.36	0.43

Program Year 2021			
	Carbon dioxide (CO_2) lbs/MWh	Nitrogen oxides (NO_x) lbs/MWh	Sulfur dioxide (SO_2) lbs/MWh
ISO-NE	658	0.24	0.04
NYISO	479	0.195	0.082
PJM	843	0.38	0.48

The emission factors used in REED for program years 2011-2021 are available in this document.
**Please note that not all data for 2021 is available. That data that is available has been provided.*

Combined-Heat-and-Power (CHP) Programs

Combined-heat-and-power (CHP) is "an integrated set of technologies for the simultaneous, on-site production of electricity and heat."[1] Some states in the REED region have energy conservation programs focused on CHP projects. These CHP-focused programs are included in REED if the programs are 1) ratepayer-funded, 2) thought of as an energy efficiency program within a state, and 3) reported by the state reporting contacts to REED. However, REED collaborates with ISO-NE to collect electric efficiency data in New England, and ISO-NE directed state reporting contacts not to include CHP projects in their data collection form. Therefore, before 2014, CHP programs were not reported to REED for the New England states, but they could have possibly been reported for New York, Maryland, Delaware, Pennsylvania and the District of Columbia.

In 2014, CHP project savings and expenditures were added back into the ISO-NE data for Massachusetts and Rhode Island.

Cost of Saved Energy

Cost of saved energy calculations are provided in NEEP's Energy Efficiency Snapshot, and are based on American Council for an Energy-Efficient Economy (ACEEE)'s recommended approach in its 2009 Saving Energy Cost-Effectively report. Participant costs are not included.

Cost of saved energy is calculated using the following equations:

$$Lifetime\ Cost\ of\ Electric\ Energy\ Savings = \frac{Total\ Program\ Expenses}{Lifetime\ Net\ kilowatt\ hour\ (kWh)\ Savings}$$

$$Lifetime\ Cost\ of\ Natural\ Gas\ Energy\ Savings = \frac{Total\ Program\ Expenses}{Lifetime\ Net\ Therm\ Savings}$$

$$Levelized\ Cost\ of\ Electricity\ Energy\ Savings = \frac{Total\ Program\ Costs \times Capital\ Recovery\ Factor\ (CRF)}{Incremental\ Annual\ Net\ kilowatt\ hour\ (kWh)\ Savings}$$

$$Levelized\ Cost\ of\ Natural\ Gas\ Energy\ Savings = \frac{Total\ Program\ Costs \times CRF}{Incremental\ Annual\ Net\ Therm\ Savings}$$

Where $CRF = \frac{A \times (I+A)^B}{(I+A)^B - 1}$

$A = real\ discount\ rate$

$B = estimated\ measure\ life$

- For program years 2011-2016, a real discount rate of 2.46% is used, which was agreed upon by all jurisdictions that report data to REED. (Source: 2011 Avoided Energy Supply Costs in New England study.)
- For program years 2017–2019, a real discount rate of 1.34% is used. (Source: 2018 Avoided Energy Supply Components in New England study.)

[1] Combined Heat and Power (CHP) and District Energy | Department of Energy

- For program years 2020–2021, a real discount rate of 0.81% is used. (Source: 2021 Avoided Energy Supply Components in New England study.)
- REED uses a consistent discount rate across the states for comparison purposes, however in practice, states use different discount rates for their cost effectiveness assessments.

Demand Response

Demand response programs compensate participants for reducing their electricity usage during periods of high electricity demand in order to reduce the strain on the electric grid. REED does not include data on demand response programs that are bid into wholesale capacity markets (which include ISO-NE, NYISO and PJM in the REED region) even if those programs are administered by a utility or funded with ratepayer money. REED includes data on *hybrid* programs that have both an energy efficiency element and a demand response element within a single program (such as smart thermostat programs or behavior-based programs, etc.) and plans to continue to do so as these pilots and programs become more prominent across the region. REED also includes data on dynamic pricing programs.

Please see the links below for information about demand response programs that are bid into wholesale capacity markets within the REED region:

Independent System Operator–New England (ISO-NE) Resources:

- Demand Threshold Price Details: Users can download a detailed report on demand-response threshold prices including the reference month supply curve data as market-level price/quantity pairs, as well as other adjustments.
- Demand Threshold Price Summary: Users can download a summary report that includes the monthly demand-response threshold price, fuel index, and other related information.

New York Independent System Operator (NY-ISO) Resources:

- Document Library: This library includes NY-ISO regulatory resources, manuals, technical bulletins and guides, and podcasts.

PJM Interconnection Resources:

- Demand Response Operations Markets Activity Reports: 2013; 2014; 2015; 2016; 2017; 2018; 2019; 2020; 2021.
- Additional PJM demand response information: "Demand Response is a voluntary PJM program that compensates end-use (retail) customers for reducing their electricity use (load), when requested by PJM, during periods of high power prices or when the reliability of the grid is threatened. These customers receive payments from PJM members called Curtailment Service Providers."

Demand Savings

REED allows for reporting of both summer and winter net and gross peak demand savings. Not all states report all parameters.

- New England: All states' peak demand reporting is consistent with ISO-NE's definition of summer and winter peak demand.
- New York: Program administrators report only summer peak demand reductions per the NYISO. From the Peak Demand Definition section (pg. 8) in the 10/15/10 Technical Manual: "According to the NYISO,

system peaks generally occur during the hour ending at 5:00 p.m. on the hottest non-holiday weekday. The peak day can occur in June, July, or August–depending on the weather. Program administrators should calculate coincident peak demand savings based on the hottest summer non-holiday weekday during the hour ending at 5:00 p.m."

- Mid-Atlantic: All jurisdictions that report to REED use reporting definitions that are consistent with PJM's definition of peak demand.

    - ***Delaware*** does not report winter peak demand savings.
    - Before 2013, the ***District of Columbia (DC)*** did not report winter peak demand savings. D.C. typically reports winter peak demand savings for some of its programs.
    - ***Maryland*** does not report winter peak demand savings. REED includes Maryland's 2011 and 2012 demand response programs because the EmPOWER Maryland surcharge covers both energy efficiency and demand response programs. However, REED does not include demand response programs for subsequent years.
    - ***Pennsylvania*** does not report winter peak demand savings.

Distributed Generation

Distributed generation programs are included in REED if those programs are 1) ratepayer-funded, 2) thought of as an energy efficiency program within a state, and 3) reported by the state reporting contacts to REED. However, REED collaborates with ISO-NE to collect electric efficiency data in New England, and ISO-NE directs state reporting contacts not to include distributed generation projects in their data collection form. Therefore, distributed generation programs are not reported to REED for the New England states, but they could have possibly been reported for New York, Maryland, Delaware, Pennsylvania, and the District of Columbia.

Expenditures

- REED was initially developed using the following expenditure categories for each program: *Customer Rebates or Incentives*, *Administration*, *Marketing*, *Performance Incentives*, *Research and Evaluation*, and *Other*. Because some states do not track expenditures according to the REED expenditure categories or allocate expenditures differently across programs (in particular for *Administration* and *Marketing* expenditures), or both, the REED Master Data spreadsheet includes only a total expenditure amount for each program. The expenditures data are not divided into the REED expenditures categories in order to prevent misunderstanding or misuse of data.
- Some states report energy efficiency programs with expenditures and no savings.
- Some states report negative program expenditures or savings due to unique state accounting practices. Below are some examples as to why, and NEEP plans to continue research these instances further.
    - ***Washington D.C.'s*** solar hot water heat program has negative electric expenditures because the program is funded through the natural gas efficiency budget. But there was an electrical expense because the installation included an electric pumping fee. So, fee is negative under electric spending but comes out of natural gas expenditures for the same program.

Generator Level Savings

REED's generator level savings are calculated using a regional transmission and distribution (T&D) loss factor for energy and demand in each of the three REED sub-regions: ISO-NE, PJM and NY-ISO as follows for each year:

	PY 2011	PY 2012	PY 2013	PY 2014	PY 2015	PY 2016	PY 2017	PY 2018	PY 2019	PY 2020	PY 2021
ISO-NE	8.0%					6.0%					
NY-ISO	8.5%		7.2%								
PJM	8.5%			8.1%							

Interactive Effects

Some REED program data includes negative gas or electric energy savings. This can be due to interactive effects. An example of interactive effects can be seen in lighting programs: high efficiency lighting generates less heat than conventional lighting, which can increase heating requirements and decrease cooling requirements. This can produce negative natural gas energy efficiency savings. Some program administrators consider these interactive effects, which account for negative energy efficiency savings.

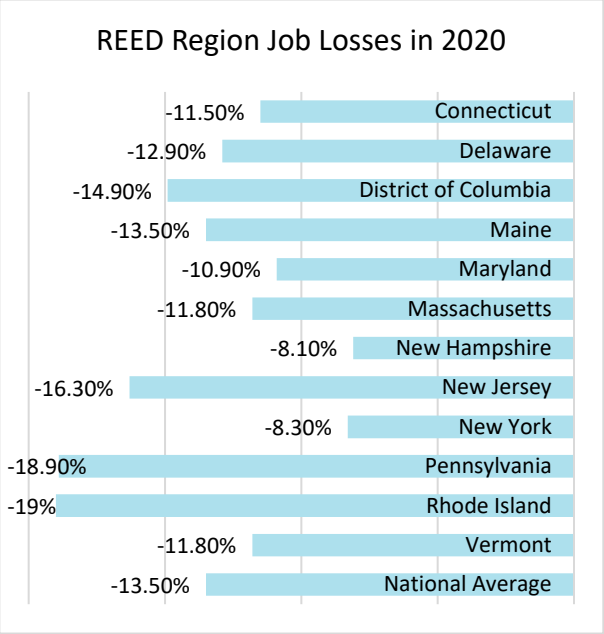
Programs in REED that report negative electric energy efficiency savings will also have negative avoided air emissions in the REED Master Data spreadsheet, since avoided air emissions are calculated based on electric energy savings.

Job Impacts

REED aims to include estimated annual job creation impacts of energy efficiency programs. In years prior to 2020, REED only provided energy efficiency jobs data that were reported by states and based on state-specific studies. Beginning in 2020, NEEP conducted broader research on the status of energy efficiency jobs throughout the REED region to provide a more comprehensive overview of energy efficiency workforce development. Summary information is included below for each state. During the COVID-19 pandemic in 2020, the energy efficiency industry saw a national average of 13.5% loss in jobs due to the pandemic. Still, the energy efficiency sector employed more workers than any other energy sector in the NEEP region except for West Virginia, in which the energy efficiency sector was the third largest energy sector.

For more information about energy efficiency jobs across the country, see E4theFuture's Energy Efficiency Jobs in America: 2020 report. To see more information about workforce policies across the region see NEEP's Regional Roundup

State	Total EE Jobs in 2020
Connecticut	31,855
District of Columbia	11,043
Delaware	10,926
Maine	7,683
Maryland	63,536
Massachusetts	77,786
New Hampshire	10,951
New Jersey	31, 781
New York	116,264
Pennsylvania	57,970
Rhode Island	10,555
Vermont	9,733



Below is a state-by-state breakdown:

- Connecticut had 31,855 energy efficiency jobs in 2020. Construction firms were the majority of energy efficient firms in Connecticut, and HVAC workers made up the majority—more than 50%--of energy efficiency workers.
    - For more information, see: 2020 Connecticut Clean Energy Industry Report

- District of Columbia (DC) reported 11,043 energy efficiency jobs in 2020. Professional services firms and firms offering "Other" services made up the majority of energy efficiency firms, and the HVAC sector employed the most energy efficiency workers in DC.
    - For more information, see: DC Sustainable Energy Utility 2020 Annual Report

- Delaware's energy efficiency sector provided 10,926 jobs. Construction firms represent the clear majority of energy efficiency firms in the state, making up nearly 80% of the landscape, and HVAC jobs represent the clear majority of energy efficiency jobs, representing more than 60% of total energy efficiency jobs.

- Maine was home to 7,683 energy efficiency jobs in 2020. The sector retracted by 10% during 2020, after three years of growth. Construction firms made up the majority of energy efficiency firm in Maine; there are approximately 3.5 times more construction firms in energy efficiency than there are Manufacturing & Trade firms, and firms providing Professional Services & Other energy efficiency-related work. Similarly, HVAC workers made up at least more than two times the other sectors, as categorized by E4TheFuture: Other; ENERGY STAR Appliances & Efficient Lighting; and Building Materials & Insulation.
    - For more information, see: Maine Clean Energy Workforce Data

- Currently, Maryland has 63,536 energy efficiency jobs. Most of the state's energy efficiency firms are construction firms, and most of the energy efficiency jobs are HVAC-related jobs.
    - For more information, see the following resources: 2020 Maryland Clean Energy Center Annual Report and 2020 EARN Maryland Annual Report

- Massachusetts reported 77,786 energy efficiency jobs in 2020. Construction firms made up the majority of energy efficiency firms, followed by firms that provide Professional Services & Other energy efficiency-related work, and the majority of Massachusetts energy efficiency workers are HVAC workers—just under 50%.
    - For more information, see the following resources: 2020 Massachusetts Clean Energy Industry Report

- New Hampshire reported 10,951 energy efficiency jobs in 2020. Construction firms make up the clear majority of energy efficiency firms in the state at 60%, and the HVAC sector provides the clear majority of energy efficiency jobs at over 60%.

- New Jersey employed 31,781 energy efficiency workers in 2020. Construction firms make up the majority of energy efficiency firms in New Jersey at nearly 60%, while HVAC employers provide the greatest number of jobs in the New Jersey, employing over half of the state's energy efficiency industry.
    - For more information, see the following resources: Green Jobs for a Sustainable Future: Leveraging Our Strengths to Grow an Inclusive Green Economy

- In New York, there was a total of 116,263 energy efficiency jobs. The majority of energy efficiency firms in New York provide Professional Services & Other (not Construction or Manufacturing & Trade) work related to energy efficiency. The HVAC sector employed by far the most workers—more than 55% of the state's energy efficiency workers.
    - For more information, see: New York Clean Energy Industry Report 2020

- Pennsylvania's energy efficiency sector represented 57,970 jobs in 2020. In the landscape of energy efficiency firms, construction firms made up the majority, and HVAC workers made up the majority of the workforce.
    - For more information, see the following resources: 2020 Pennsylvania Energy Employment Report and 2020 Pennsylvania Clean Energy Employment Report

- In Rhode Island, there were 10,555 energy efficiency jobs in 2020. Construction firms made up the clear majority of energy efficiency firms, at nearly 60% of the sector landscape, and the HVAC sector supplied the most energy efficiency jobs, followed closely by the ENERGY STAR Appliances & Efficient Lighting sector.
    - For more information, see: 2020 Rhode Island Energy Efficiency and Resource Management Council Annual Report

- Vermont was home to 9,733 energy efficiency jobs in 2020. Construction firms comprised the majority of energy efficiency firms, and HVAC professionals made up the majority of energy efficiency professionals.
    - For more information, see the following resources: VT Department of Public Service Clean Energy Development Fund Annual Report to the Legislature FY 2020 and 2020 Vermont Clean Energy Industry Report

Peak to Energy Savings Ratio

Peak to Energy Savings Ratio is calculated as:

$$Peak\ to\ Energy\ Savings\ Ratio\ \left(\frac{MW}{GWh}\right) = \frac{\begin{matrix}Net\ Summer\ Demand\ Savings\\ Meter\ level\ (MW)\end{matrix}}{\begin{matrix}Net\ Annual\ Energy\ Savings\\ Electric\ Meter\ level\ (MWh)\end{matrix}} \times \frac{1000\ MWh}{1\ GWh}$$

Program Type Limitations

REED's program type categories do not neatly fit for all programs because some programs cut across categories. In most cases, state reporting contacts have selected the program type category that most closely fits each program. In cases when the state reporting contact does not provide direction on the appropriate program type category, NEEP staff makes this determination to the best of their ability.

State Documents and Key Information–Connecticut

This section provides key information about Connecticut's energy efficiency savings calculations and reporting practices, along with links to key state documents including plans, reports, and other relevant resources. The information is collected through REED's annual state data collection process or obtained from state resources.

Program Administrators and Reporting/EM&V Practices

- Program Administrators in REED: Connecticut Light & Power doing business as Eversource CT Electric, Connecticut Gas, Southern Connecticut Gas, United Illuminating, and Yankee Gas doing business as Eversource CT Gas.
- Savings: Expenditures and savings figures do not include municipal utility programs; gross savings figures do not include United Illuminating programs.
- Energy Efficiency Resource Standard for 2020: Electric, 1.15 percent of annual retail sales; Natural Gas, .56 percent of annual sales.

Key Plans, Reports, and Savings Assumptions Resources

- Connecticut's legislation mandating all cost-effective energy efficiency
- Connecticut's Program Savings Documents (Technical Reference Manuals): 2011; 2012; 2013; 2014; 2015; 2016; 2017; 2018; 2019; 2020.
- Connecticut's 2020 Conservation and Load Management Plan.
- Connecticut's Program Evaluation Reports
- Connecticut's Energy Efficiency Fund Annual Legislative Reports
- Connecticut's Energy Efficiency Board Document Library
- Connecticut's Evaluation Reports and Studies
- Connecticut's Statewide Energy Efficiency Dashboard

Evaluation Process

The Connecticut Energy Efficiency Board (EEB) includes an Evaluation Committee consisting of non-utility EEB members who work directly with an EEB Evaluation Consultant team to oversee energy efficiency program

evaluation planning and completion. This role includes evaluation planning, study development, contractor selection, project initiation, project management and completion, and finalization of evaluation reports. Energy efficiency program administrators (Connecticut Light & Power and United Illuminating) assist the Evaluation Committee and evaluation consulting team but do not hold a primary role in evaluation. The Connecticut Department of Energy and Environmental Protection has overall oversight authority of evaluation. See the EEB's 2012–2024 Evaluation Plan for current and future evaluation projects.

State Documents and Key Information–District of Columbia

This section provides key information about the District of Columbia's energy efficiency savings calculations and reporting practices, along with links to key state documents including plans, reports, and other relevant resources. The information is collected through REED's annual state data collection process or obtained from state resources.

Program Administrator and Reporting/EM&V Practices

- Program Administrator Included in REED: District of Columbia Sustainable Energy Utility (DCSEU).
- Expenditures: Programs are funded through the Sustainable Energy Trust Fund, which is financed by a surcharge on all electric and natural gas utility ratepayers in DC.
- Program Year: DC's energy efficiency programs are conducted on a fiscal year basis: October 1 to September 30.
- Energy Efficiency Resource Standard for 2020: DC does not have an energy efficiency resource standard. The DCSEU is provided performance incentives for hitting certain electric and gas targets. For fiscal year 2020, DCSEU achieved 106,183 MWh of electrical savings and 2,203,353 Therms of gas savings.

Key Plans, Reports, and Savings Assumptions Resources

- The District of Columbia's Program Savings Documents (Technical Reference Manuals): 2011; 2013; 2014; 2015; 2017; 2018; 2019; 2020
- The District of Columbia's Program Evaluation Reports
- The District of Columbia's Program Administrator Annual Reports
- The District of Columbia's Energy Efficiency, Demand Response, and Renewable Energy Potential Studies, The Benchmark Assessment Infographic of 2020, and The Impact Evaluation Report of 2020

Evaluation Process

In 2008, the District of Columbia enacted the Clean and Affordable Energy Act, which created the Sustainable Energy Trust Fund and authorized the creation of the District of Columbia Sustainable Energy Utility (DCSEU). It also designated the DCSEU to be the one-stop resource for energy efficiency and renewable energy services for DC residents and businesses. In 2011, the District Department of the Environment (DDOE) selected Vermont Energy Investment Corporation (VEIC) to be the lead implementer for the DCSEU. A separate third-party contractor is retained to conduct program evaluations.

The DCSEU must release quarterly reports that detail how it implements energy efficient policies and programs. At the end of each contract year, DDOE must commission an independent evaluation of the DCSEU's performance.

For more information about DCSEU programs, including contractor resources, visit the DCSEU website.

State Documents and Key Information–Delaware

This section provides key information about Delaware's energy efficiency savings calculations and reporting practices, along with links to key state documents including plans, reports, and other relevant resources. The information is collected through REED's annual state data collection process or obtained from state resources.

Program Administrators and Reporting/EM&V Practices

- Program Administrators Included in REED: Delaware Division of Energy and Climate, Delaware Sustainable Energy Utility/Energize Delaware. REED does not include program year 2019 data for Delaware.
- Expenditures: Delaware's Energy Efficiency Investment Fund program is capitalized annually with $5 million in public utility tax receipts. Non-residential electric or natural gas consumers located in Delaware that pay the Delaware Public Utility Tax are eligible to apply to the program. Programs administered by the Delaware Sustainable Energy Utility/Energize Delaware are funded through Regional Greenhouse Gas Initiative (RGGI) proceeds.
- Energy Efficiency Resource Standard for 2020: Electric, .7 percent of annual retail sales relative to 2019 baseline; Natural Gas, .5 percent of annual retail sales relative to 2019 baseline.

Key Plans, Reports, and Savings Assumptions Resources

- Delaware's legislation mandating all cost-effective energy efficiency
- Delaware's Program Savings Documents (Technical Reference Manuals): 2011; 2013; 2014; 2015; 2016; 2017; 2018; 2019; 2020
- Delmarva's 2017-2019 Energy Efficiency Program Plan
- Delaware Sustainable Energy Utility/Energize Delaware Strategic Plan
- Delaware Sustainable Energy Utility/Energize Delaware Annual Reports
- Delaware Sustainable Energy Utility/Energize Delaware Executive Director Reports & Monthly Program Activity Reports
- Delaware Sustainable Energy Utility/Energize Delaware 2021 Annual Report . All Annual Reports are available online.
- 2019 Delaware Energy Efficiency Market Potential Study Update and original 2014 Study of Potential for Energy Savings in Delaware

Evaluation Process

Senate Bill 150 with House Amendment 2 (passed on July 1, 2014) directs Delaware utilities to provide cost-effective energy efficiency programs. The Delaware Energy Efficiency Advisory Council (EEAC) was created in 2014 to assist with the development of Delaware's energy efficiency programs. The Delaware Department of Natural Resources and Environmental Control (DNREC) Division of Climate, Coastal, & Energy has statutory oversight and is responsible for establishing and overseeing EM&V regulations for the energy efficiency programs. For more information, see the DNREC EM&V website.

In 2015, Delaware finalized regulations governing Evaluation, Measurement, and Verification Procedures and Standards.

For more information about Delaware Sustainable Energy Utility/Energize Delaware programs, visit the Delaware Sustainable Energy Utility/Energize Delaware website.

State Documents and Key Information–Massachusetts

This section provides key information about Massachusetts' energy efficiency savings calculations and reporting practices, along with links to key state documents including plans, reports, and other relevant resources. The information is collected through REED's annual state data collection process or obtained from state resources.

Program Administrators and Reporting/EM&V Practices

- Program Administrators Included in REED: Bay State Gas, Berkshire Gas, Cape Light Compact, Columbia Gas of Massachusetts, National Grid Electric and Gas, New England Gas, NSTAR Electric and Gas (Northeast Utilities), Unitil Electric and Gas and Western Mass Electric Company (WMECO).
- Expenditures: The Other expenditures category includes sales, technical assistance, and training funds.
- Program Types: Massachusetts programs without savings are assigned to the Education program type category.
- Energy Efficiency Resource Standard for 2020: Electric: 2.70 percent annual retail sales for 2019–2021. Gas: 1.25 percent annual retail sales for 2019– 2021 (based on forecasted retail sales).

Key Plans, Reports, and Savings Assumptions Resources

- Massachusetts' legislation mandating the pursuit of all cost effective energy efficiency
- Massachusetts' Program Savings Documents (Technical Reference Manuals): 2011, 2012, 2013-2015, 2016-2018, 2019 , eTRM (2020 and beyond)
- Massachusetts' Energy Efficiency Program Plans
- Massachusetts' Evaluation, Measurement and Verification Studies
- Massachusetts' Program Administrator Annual Reports

Evaluation Process

The Massachusetts Department of Public Utilities (MA DPU) requires all program administrators to include evaluation plans as part of their three-year energy efficiency plans. The evaluation plans identify the activities that will be taken to ensure that programs are monitored and evaluated, and that savings and costs are measured and verified. All evaluations are statewide, typically administered by individual program administrators, are planned and performed in collaboration with the Massachusetts Energy Efficiency Advisory Council (MA EEAC), and are performed by standing contractors.

Evaluation activities are overseen by a designated evaluation consultant who reports to the MA EEAC and the Massachusetts Department of Energy Resources (MA DOER). The EM&V Management Committee provides a forum for statewide evaluation issues, and it provides guidance, planning and direction to each evaluation research area. In 2019, Mass Save program administrators implemented their third three-year plan through 2021.

For more information, see evaluation plans and reports as well as updates on the MA EEEAC Evaluation website, including the 2019–2021 Massachusetts Statewide Energy Efficiency Strategic Evaluation Plan.

State Documents and Key Information–Maryland

This section provides key information about Maryland's energy efficiency savings calculations and reporting practices, along with links to key state documents including plans, reports, and other relevant resources. The information is collected through REED's annual state data collection process or obtained from state resources.

Program Administrators and Reporting/EM&V Practices

- Program Administrators Included in REED: Baltimore Gas & Electric, Delmarva Power & Light, Potomac Edison, Potomac Electric Power Company, Southern Maryland Electric Cooperative, and Washington Gas.
- Demand Savings: Program data is not included for 2017
- Energy Efficiency Resource Standard for 2020: Electric: 2.0 percent annual retail sales.

Key Plans, Reports, and Savings Assumptions Resources

- Maryland's legislation establishing an energy efficiency resource standard
- Maryland's Program Savings Document (Technical Reference Manual): 2011; 2013; 2014; 2015; 2017; 2018; 2019; 2020
- Maryland's Energy Efficiency Program Plan
- Maryland's EmPOWER Maryland Energy Efficiency Act Annual Reports (scroll down below Wind Energy Reports)
- Maryland's EmPOWER Planning History, including Natural Gas Energy Efficiency Potential in Maryland study

Evaluation Process

In Maryland, the EmPOWER Maryland utilities provide programs and retain an independent contractor to conduct evaluations. The Maryland Energy Administration (MEA) is responsible for hiring the third-party contractor to develop and implement EM&V plans and to provide evaluation management. Program administrators report semi-annually to the Maryland Public Service Commission (MD PSC). The MD PSC retains an independent third-party evaluator (Navigant/Cadmus) who reviews and approves the EmPOWER Maryland programs under the 2008 EmPOWER Maryland Act. Order Number 82869 establishes the Commission-led Evaluator Model for the evaluation, measurement, and verification process of the EmPOWER Maryland energy efficiency programs. Commission-approved demand response programs are also included in this EM&V process.

For more information about EmPOWER Maryland programs, see links and resources on MEA's EmPOWER Maryland website.

State Documents and Key Information–Maine

This section provides key information about Maine's energy efficiency savings calculations and reporting practices, along with links to key state documents including plans, reports, and other relevant resources. The information is collected through REED's annual state data collection process or obtained from state resources

Program Administrator and Reporting/EM&V Practices

- Program Administrator Included in REED: Efficiency Maine Trust
- Expenditures: Maine does not have performance incentives. Other expenditures represent technical support expenditures.
- Program Year: Maine's programs are conducted on a fiscal year basis: July 1 to June 30.
- Energy Efficiency Resource Standard for 2020: Electric is 2.3 percent and Natural gas is .1 percent. Maine also has a legislative goal to increase energy efficiency from energy and natural gas programs by 20% by 2030 from 2012 levels.

Key Plans, Reports, and Savings Assumptions Resources

- Maine's legislation mandating all cost-effective energy efficiency
- Maine's Program Savings Documents (Technical Reference Manuals): Commercial/Industrial and Multifamily and Retail/Residential
- Efficiency Maine Trust's Energy Efficiency Program Plans
- Efficiency Maine Trust's Reports, including Program Evaluation Reports and Annual Reports

Evaluation Process

From the Efficiency Maine Trust's 2021 Annual Report: "The Trust's evaluation, measurement, and verification (EM&V) activities provide research and data-driven analysis to inform program design and delivery strategies, verify program results, and facilitate continuous program and organizational improvement. The Trust carries out these activities using a combination of in-house initiatives and subcontracted, independent third-party reviews performed by firms that specialize in the evaluation of energy efficiency programs."

In fiscal year 2019, The Trust finalized a number of studies to better understand the potential for cost-effective energy savings and the market channels for energy efficiency measures under Triennial Plan IV. In addition, they set a number of plans for fiscal year 2020.

For more information about Efficiency Maine Trust's programs, see the Efficiency Maine Trust website.

State Documents and Key Information–New Hampshire

This section provides key information about New Hampshire's energy efficiency savings calculations and reporting practices, along with links to key state documents including plans, reports, and other relevant resources. The information is collected through REED's annual state data collection process or obtained from state resources.

Program Administrators and Reporting/EM&V Practices

- Program Administrators Included in REED: Liberty Utilities, Unitil, Granite State Electric Company and Eversource NH. The program year 2018, 2019, and 2020 data does not include Unitil gas programs.
- Energy Efficiency Resource Standard for 2020: Electric is 1.3 percent. Natural Gas is 0.8 percent.

Key Plans, Reports, and Savings Assumptions Resources

- New Hampshire's energy efficiency legislation includes Chapter 374-F Electric Utility Restructuring and New Hampshire Public Utilities Commission Order Approving Gas and Electric Utilities Energy Efficiency Resource Standard
- New Hampshire's Program Savings Documents (Technical Reference Manuals): 2022 (This is New Hampshire's first TRM)
- New Hampshire's Energy Efficiency Program Plans and Program Evaluation Reports
- New Hampshire's Program Administrator Annual Reports
- New Hampshire's Energy Optimization through Fuel Switching Study

Evaluation Process

The New Hampshire Public Utilities Commission (NH PUC) oversees evaluation activities. The NH PUC seeks input and advice from the New Hampshire program administrators about monitoring and evaluation and also helps coordinate the program administrators' implementation efforts for core programs. Program administrators have the opportunity to comment on preliminary study findings and results before publication, and can participate in regional monitoring and evaluation studies as well as studies conducted by multi-jurisdictional utilities on a case-by case basis. The NH PUC invites interested parties to attend and provide input at evaluation presentations, and it pursues all available means to protect confidential customer information given that monitoring and evaluation studies frequently require access to such information.

State Documents and Key Information–New Jersey

This section provides key information about New Jersey's energy efficiency savings calculations and reporting practices, along with links to key state documents including plans, reports, and other relevant resources. The information is collected through REED's annual state data collection process or obtained from state resources.

Program Administrator and Reporting/EM&V Practices

- Program Administrator Included in REED: New Jersey Clean Energy Programs.
- Program Year: New Jersey's program year runs from July 1 to June 30. Following the commencement year of utility-led programs, utilities submit compliance filings by November 1 for approval by May 1.
- Energy Efficiency Resource Standard for 2020: New Jersey does not have any for 2020. The Board of Public Utilities conducts Comprehensive Resource Assessments that includes a potential study to guide program design and objectives.

Key Plans, Reports, and Savings Assumptions Resources

- Legislation establishing New Jersey's efficiency funding
- New Jersey's Program Savings Documents or Technical Reference Manuals: 2007; 2009; 2010; 2011; 2012; 2014; 2015; 2016; 2017; 2019; 2020; 2021
- New Jersey's Energy Efficiency Program Plans (Click Program Administrator (TRC) Filing)
- New Jersey's Energy Master Plan
- New Jersey's Program Evaluation Reports
- New Jersey's Program Administrator Annual Reports
- New Jersey's Market Analysis and Baseline Studies

Evaluation Process

New Jersey Clean Energy Program evaluations are publicly available on its Program Evaluations, Market Analysis and Protocols website. This includes annual cost-benefit analyses of the suite of Clean Energy Programs offerings, program-specific impact and process evaluations, and the protocols used to measure resource savings.

New Jersey's approach to program administration and evaluation is changing. In 2018, New Jersey passed the Clean Energy Act, which improves and expands the state's renewable and energy efficiency programs. New Jersey's Clean Energy Program (NJCEP), which has administered the energy efficiency programs included in REED to date, will no longer be the primary program administrator. While NJCEP will continue to offer some energy efficiency programs, New Jersey's investor-owned electric and natural gas utility companies are also required to administer energy efficiency programs for their customers. More information about the energy efficiency program transition from NJCEP to the utilities is available on the New Jersey Clean Energy Program website. New Jersey currently has a state-run energy efficiency working group to guide the creation of their first statewide energy efficiency programs and complementary workforce program administered by the utilities. NEEP participates in this working group and will provide input on the design and implementation of New Jersey's EM&V approach. It is likely that a statewide evaluator will be responsible for overseeing and conducting New Jersey's program evaluations going forward.

State Documents and Key Information–New York

This page provides key information about New York's energy efficiency savings calculations and reporting practices, along with links to key state documents including plans, reports, and other relevant resources. The information is collected through REED's annual state data collection process or obtained from state resources.

Program Administrators and Reporting/EM&V Practices

- Program Administrators Included in REED: Central Hudson, Con Edison, Keyspan Long Island, Keyspan NY, Long Island Power Authority, Niagara Mohawk, New York State Electric and Gas, NYSERDA, Rochester Gas & Electric, Orange & Rockland, St. Lawrence Gas and Corning Gas.
- Savings: Figures are accurate as of date of collection. Updates to savings values made after the reporting period closed are not captured.
- Energy Efficiency Resource Standard for 2020: New York has a statewide target of 185TBtu of end use savings across all fuels, with a sub-target for 3 percent annual electric savings and 1.3 percent of gas sales from 2020 - 2025.

Key Plans, Reports, and Savings Assumptions Resources

- New York's New Efficiency, New York Report
- New York's Program Savings Document (Technical Reference Manual)
- New York's Energy Efficiency Portfolio Standard and Program Plans
- New York's Program Evaluation Reports
- New York's Program Administrator Annual Reports
- New York's Building Stock and Potential Studies and Energy Efficiency and Renewable Energy Potential Studies
- New York provides for public access of its energy efficiency program results through Open NY and the New York State Clean Energy Dashboard

Evaluation Process

In New York, the Department of Public Service (NY DPS) approves energy efficiency programs and budgets, which are administered by the utilities and the New York State Energy and Research Development Authority (NYSERDA). In 2008, the NY DPS established an Energy Efficiency Portfolio Standard (EEPS) to reduce electricity usage (See DPS EEPS Evaluation webpage). In 2014, the NY DPS merged the Evaluation Advisory Group and the Implementation Advisory Group into the E2 Working Group, and it launched its Revised Energy Vision (REV), which entailed developing a new infrastructure for New York to meet its goals via its Clean Energy Fund with a focus on building a green economy. The CEF works with REV to make sure the market is ready to provide the services REV offers. NYPA and PSEG-Long Island participate in E2 Working Group evaluation efforts, but the New York Public Service Commission does not regulate them. In 2018, NYSERDA released New Efficiency: New York, the most aggressive energy efficiency strategy in New York's history. It established a fuel neutral goal of 185 trillion British thermal units (TBtu) reductions by 2025 and more comprehensive efficiency measures.

State Documents and Key Information–Pennsylvania

This page provides key information about Pennsylvania's energy efficiency savings calculations and reporting practices, along with links to key state documents including plans, reports, and other relevant resources. REED includes data from program years 2020 and 2021 The information is collected publicly available state resources.

Program Administrators and Reporting/EM&V Practices

- Program Administrators Included in REED: Duquesne Light Company, Metropolitan Edison Company, Pennsylvania Electric Company, Pennsylvania Power Company, West Penn Power Company, PECO Energy Company, PPL Electric Utilities
- Peak Demand Savings Goals: 1.4 percent to two percent for 2016 – 2020.
- Energy Efficiency Resource Standard for 2020: Electric savings goals of an average of 4.2 percent from all utilities earned during the 2016-2020 cycle. See the Phase III Implementation Order for further details.

Key Plans, Reports, and Savings Assumptions Resources

- Legislation establishing Pennsylvania's energy efficiency resource standard
- Pennsylvania's Program Savings Document or Technical Reference Manual
- Pennsylvania's Energy Efficiency Program Plans
- Pennsylvania's Act 129 Statewide Evaluator Reports and Program Administrator Annual Reports
- Pennsylvania's Energy Efficiency Potential Study for Pennsylvania

Evaluation Process

Pennsylvania has a Statewide Evaluator (SWE), as called for by Act 129, which established energy efficiency and conservation programs in the state of Pennsylvania. The SWE "monitors and verifies data collection, quality assurance and the results of each electric distribution company's (EDC) Energy Efficiency and Conservation Plan (EE&C Plan) and the EE&C program as a whole."[2] The Pennsylvania Public Utilities Commission maintains a website with the SWE's Act 129 reports, including statewide baseline studies, potential studies, and other supporting reports.

State Documents and Key Information–Rhode Island

This page provides key information about Rhode Island's energy efficiency savings calculations and reporting practices, along with links to key state documents including plans, reports, and other relevant resources. The information is collected through REED's annual state data collection process or obtained from state resources.

Program Administrators and Reporting/EM&V Practices

- Program Administrators Included in REED: National Grid Electric and Gas, Rhode and the Narragansett Electric Company.
- Program Type: Programs without savings are assigned to the Education program type category.
- Savings: Rhode Island data include combined-heat-and-power program expenditures and savings starting with program year 2014.
- Energy Efficiency Resource Standard for 2020: Electric 2.5 percent of annual sales and natural gas .97 percent of annual sales.

Key Plans, Reports, and Savings Assumptions Resources

- Rhode Island legislation mandating all cost-effective energy efficiency
- Rhode Island's Program Savings Documents or Technical Reference Manuals: 2012; 2013; 2014; 2015; 2016; 2019; 2020; 2022
- Rhode Island's Energy Efficiency Program Plans
- Rhode Island's Annual Program Evaluation Reports
- Rhode Island's Opportunity Report – Phase I; Phase II; Gas and Unregulated Fuels
- Rhode Island's Energy Efficiency Market Potential Study

Evaluation Process

- The Rhode Island Public Utilities Commission (RI PUC) reviews and approves the design and implementation of the utilities' energy efficiency programs on an annual basis. The annual energy efficiency program plans are required to include a detailed Measurement and Verification Plan. Studies are proposed in the Energy Efficiency Program Plan. The utilities are also required to file reports about their programs and evaluation results with the RI Energy Efficiency and Resource Management Council (RI EERMC) and the RI PUC.

State Documents and Key Information–Vermont

This page provides key information about Vermont's energy efficiency savings calculations and reporting practices, along with links to key state documents including plans, reports, and other relevant resources. The information collected through REED's annual state data collection process or obtained from state resources.

Program Administrators and Reporting/EM&V Practices

- Program Administrators Included in REED: Burlington Electric Department (BED), Efficiency Vermont (EVT), and Vermont Gas Systems (VGS).
- Energy Savings: Vermont does not separate out small and large commercial and industrial (C&I) programs currently in its reporting, therefore all C&I program savings are reported under the Small C&I program type.
- Funding Sources: Vermont's electric programs are funded through its Energy Efficiency Charge (EEC) which is the same as system benefit charges in other states. Efficiency programs for unregulated deliverable fuels (heating oil, propane and kerosene) are funded with ISO-New England Forward Capacity Market (FCM) revenues and Regional Greenhouse Gas Initiative (RGGI) auction revenues. Natural gas efficiency programs are funded through rates that include a predetermined level of efficiency program activity.
- Energy Efficiency Resource Standard for 2020: Electric: 2.4 percent of retail sales. Gas: 0.5 percent of retail sales (based on forecasted retail sales).

Key Plans, Reports, and Savings Assumptions Resources

- Vermont's legislation mandating all cost-effective energy efficiency
- Vermont's Energy Efficiency Program Plans and Annual Reports: Efficiency Vermont; Vermont Gas Systems ; Burlington Electric Department
- Vermont's Program Evaluation Reports
- Vermont's 2019 Energy Efficiency Potential Study and 2017 Energy Efficiency Potential Study. For Vermont's Energy Efficiency Potential Studies prior to 2017, see the Vermont Public Service Board's Efficiency website

Evaluation Process

- Vermont's statewide energy efficiency programs are currently delivered through a contract between the Public Service Board (PSB) and the Vermont Energy Investment Corporation to serve as Efficiency Vermont. The exception is in the City of Burlington, where the municipality delivers these services. Both entities are referred to as Energy Efficiency Utilities (EEUs). The Department of Public Service (VT DPS) is the entity that provides for formal independent evaluation of energy efficiency programs approved by the PSB for EEU implementation. The VT DPS's evaluation activities include an annual verification of the EEUs' energy and capacity savings and total resource benefit claims. For information on its process and reports, see the VT DPS Energy Efficiency Utility Verification and Evaluation webpage.