



Energy Efficiency Snapshot

Summer 2019

Energy Efficiency by the Numbers in the
Northeast and Mid-Atlantic States

Northeast Energy Efficiency Partnerships



“Assist the Northeast and Mid-Atlantic region to reduce building sector energy consumption 3% per year and carbon emissions 40% by 2030 (relative to 2001)”

Mission

We seek to accelerate regional collaboration to promote advanced energy efficiency and related solutions in homes, buildings, industry, and communities.

Vision

We envision the region's homes, buildings, and communities transformed into efficient, affordable, low-carbon, resilient places to live, work, and play.

Approach

Drive market transformation regionally by fostering collaboration and innovation, developing tools, and disseminating knowledge



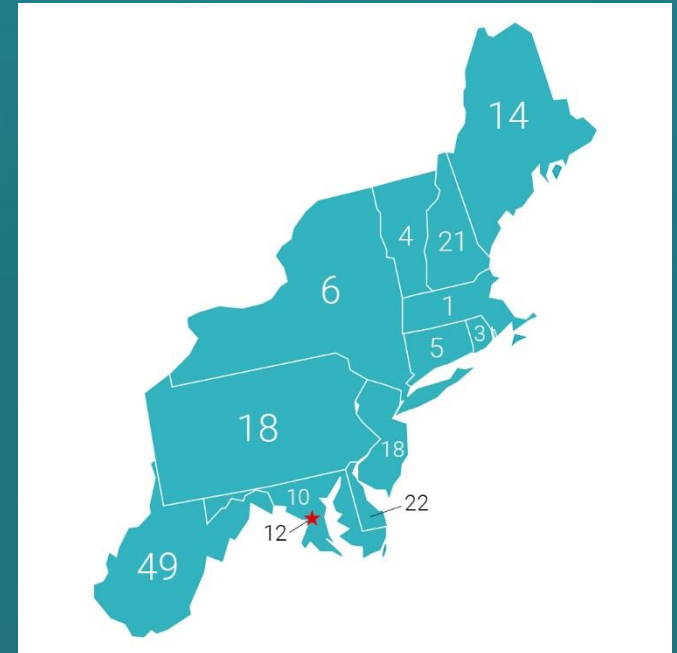
NEEP's Annual Snapshot

An Overview



The Snapshot provides an overview of energy efficiency policy by the numbers in the Northeast and the Mid-Atlantic region. To show continued leadership, we update this report annually with charts and tables on the following:

- Energy efficiency as the least-cost energy resource
- Energy efficiency as an economic driver
- State energy efficiency policies and savings goals
- Public policies furthering advanced energy efficiency
- Per capita energy efficiency expenditures
- Efficiency savings as a percent of retail sales (gas and electric)
- Cost of saved energy by state
- Energy savings by sector and program type
- Avoided carbon emissions from energy savings



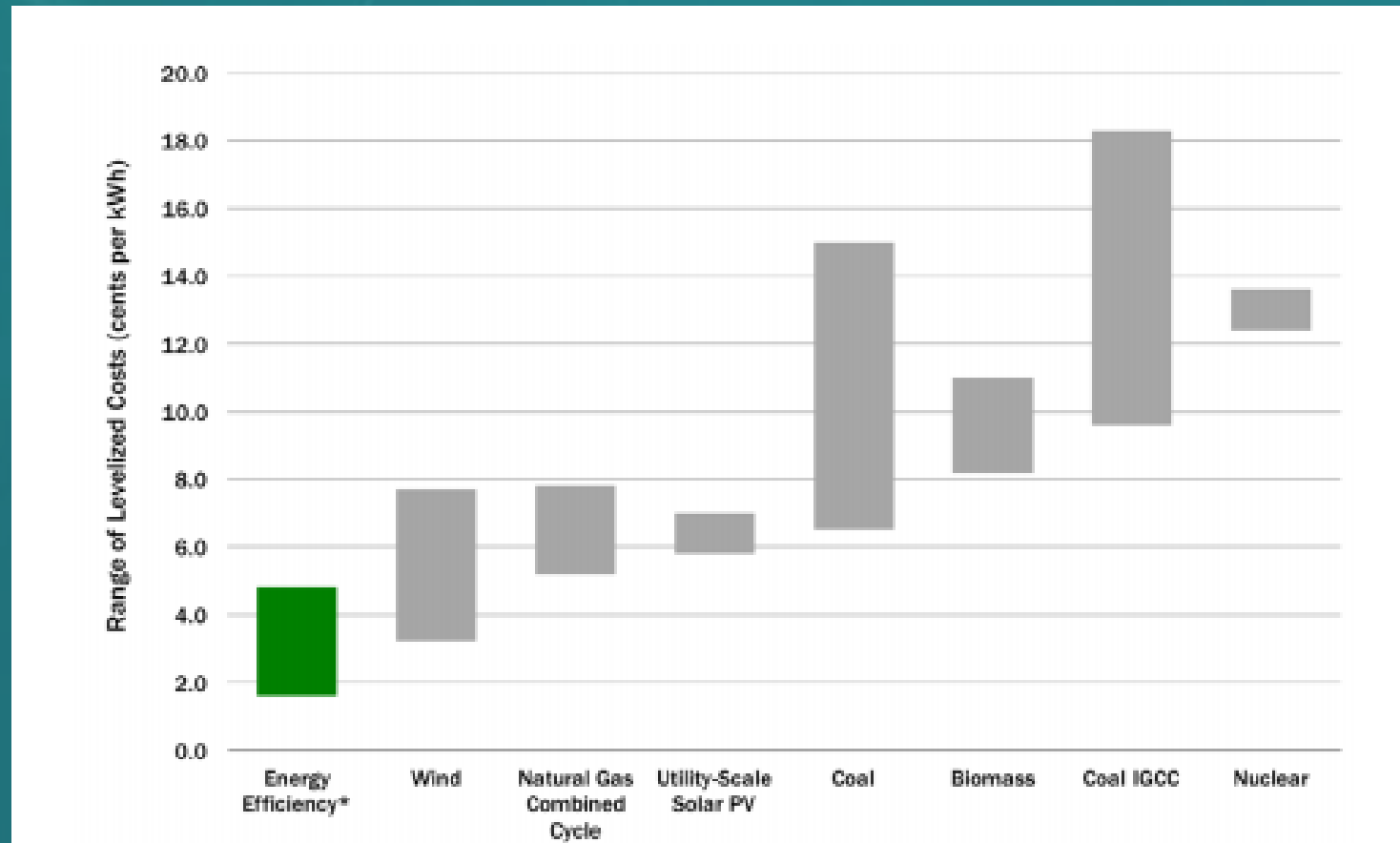
ACEEE 2018 State Scorecard Rankings

This presentation uses data from the Regional Energy Efficiency Database (REED), program administrator plans, annual reports, U.S. Energy Information Administration, and ACEEE. 2

Energy Efficiency

The Least-Cost Energy Resource

With a levelized cost of \$0.01-\$0.05/kWh, investments in energy efficiency are more cost-effective than investments in *any* conventional energy generation resource.



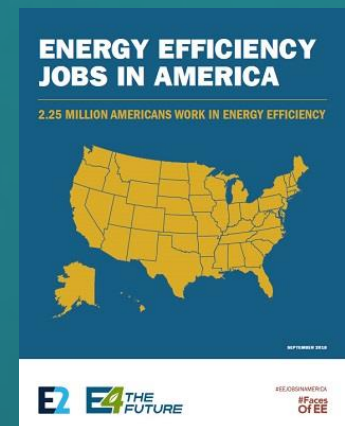
Energy Efficiency as an Economic Driver

Job Creation and Economic Growth

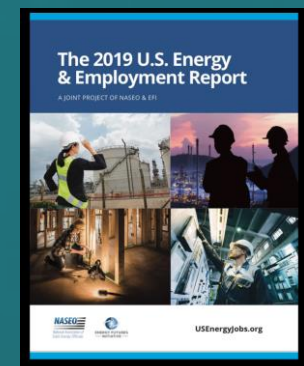


	Percent Total Population Employed By EE	Total Direct Jobs in Energy Efficiency
DC	1.76%	12,359
VT	1.75%	10,939
DE	1.28%	12,372
MA	1.23%	84,556
RI	1.19%	12,588
MD	1.14%	68,981
CT	0.97%	34,743
NH	0.84%	11,336
ME	0.62%	8,312
NY	0.60%	117,339
PA	0.51%	65,288
NJ	0.38%	33,815

Source: E4TheFuture
Energy Efficiency Jobs in America
 (September 2018)



Resource: NASEO & EFI
The 2019 U.S. Energy and
 Employment Report



Energy Efficiency Policies and Goals

New England



STATE	POLICY TYPE	PROGRAM ADMINISTRATOR	ENERGY SAVINGS GOALS
Connecticut	<u>All Cost-Effective Energy Efficiency</u>	Electric & Gas Utilities <u>2019-2021 Plan</u>	Electric: 1.13% retail sales for 2019-2021 Gas: 0.60% retail sales for 2019-2021 (forecasted retail sales)
Maine	<u>All Cost-Effective Energy Efficiency</u>	Efficiency Maine Trust <u>FY 2020-2022 Plan</u> <u>Budgets and Metrics</u>	Electric and Gas: Savings of at least 20% by 2020. Incremental savings targets of ~2.4%/year for electric and ~0.2%/year for gas for 2017-2019
Massachusetts	<u>All Cost-Effective Energy Efficiency</u>	Electric & Gas Utilities + CLC <u>2019-2021 Three-Year Plans</u> <u>Term Sheet</u>	Electric: 2.70% retail sales for 2019-2021 Gas: 1.25% retail sales for 2019-2021 (forecasted retail sales)
New Hampshire	<u>All Cost-Effective Energy Efficiency</u>	Electric & Gas Utilities <u>2018-2020 Plan</u>	Electric: 0.8% retail sales in 2018, 1% in 2019 and 1.3% in 2020 Gas: 0.7% retail sales in 2018, 0.75% in 2019, and 0.8% in 2020
Rhode Island	<u>All Cost-Effective Energy Efficiency</u>	Electric & Gas Utilities <u>2018-2020 Plan</u>	Electric: 2.6% retail sales Gas: 1.03% retail sales (2015 retail sales)
Vermont	<u>All Cost-Effective Energy Efficiency</u>	Efficiency Vermont, BED, VGS <u>2018-2020 Plan</u>	Electric: 2.3% retail sales Gas: 0.9% retail sales (forecasted retail sales)

Energy Efficiency Policies and Goals

The Mid-Atlantic



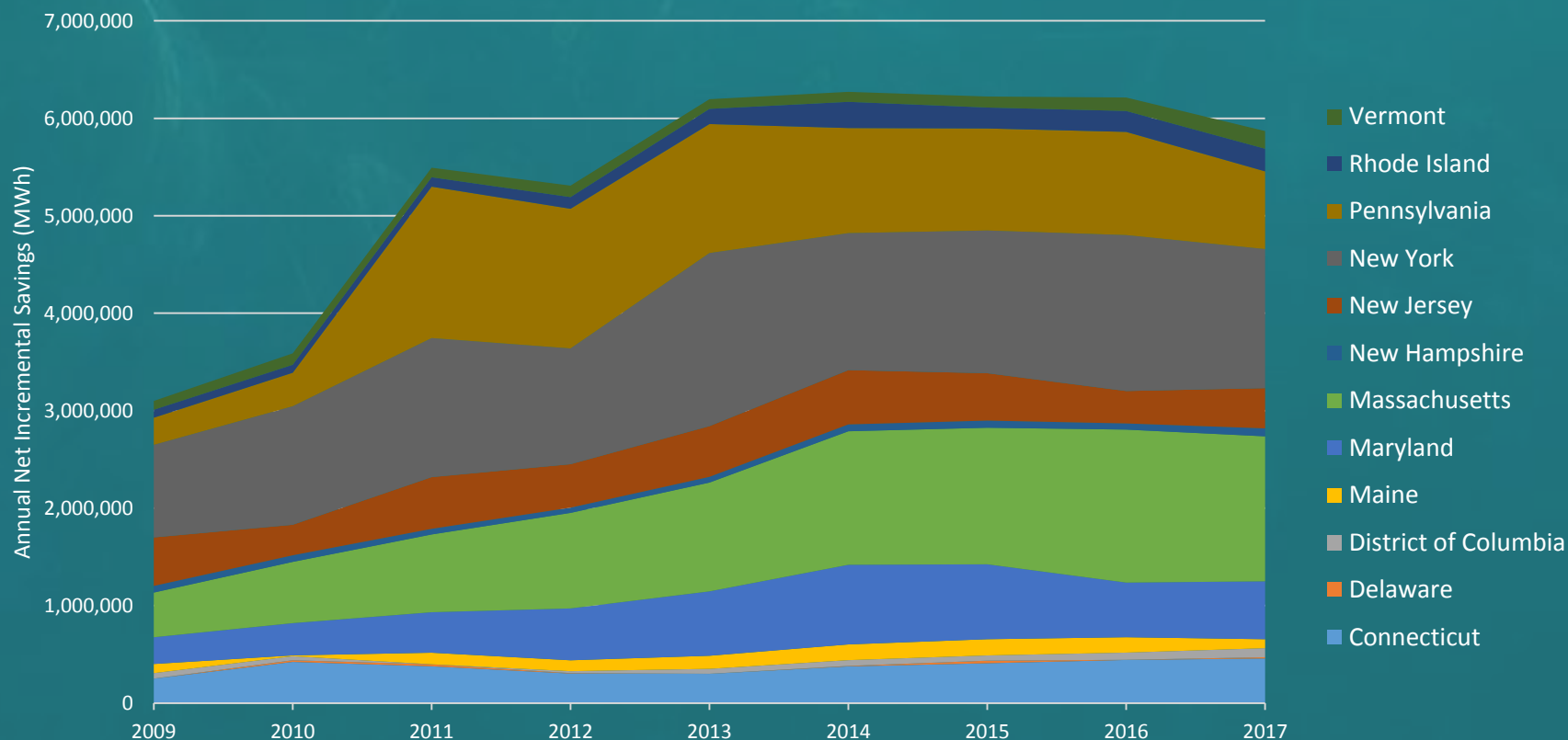
STATE	POLICY TYPE	PROGRAM ADMINISTRATOR	ENERGY SAVINGS GOALS
Delaware	All Cost-Effective Energy Efficiency	Utilities + Sustainable Energy Utility	Voluntary energy savings targets Electric: 2018 = 0.7%, 2019 = 1.0% Gas: 2018 = 0.3%, 2019 = 0.5%
District of Columbia	Efficiency Utility Goals	Sustainable Energy Utility 2018 Performance Benchmark Report	Electric: 1.06% (min target) to 1.5% (max target) retail sales for 2017-2018 Gas: 0.66% (min target) to 1.0% (max target) retail sales for 2017-2018 (2014 retail sales)
Maryland	Energy Efficiency Resource Standard	Electric and Gas Utilities	Electric: 2.0% retail sales (2020)
New Jersey	Efficiency Funding	NJCEP OCE+ Utilities Strategic Plan	No mandated savings goals
New York	New Efficiency New York Order Adopting Accelerated EE Targets	NYSERDA + Utilities NYSERDA Clean Energy Fund Utility ETIPs	Incremental targets vary by utility (0.4% to 0.9% for 2016–2018). 185 Tbtu site energy savings by 2025
Pennsylvania	Energy Efficiency & Conservation (EE&C) Plans	Electric Utilities Act 129 Phase III	Average electric savings of ~ 3.7% (range of 2.6% - 5.0%) from EE between 2016-2021; No Gas

Energy Efficiency Policies and Goals

Significant Electric Energy Savings



Annual incremental electric energy savings from energy efficiency programs in the region have increased significantly from 2009 to 2017, growing from ~3.1 million MWh in 2009 to ~5.8 million MWh in 2017.

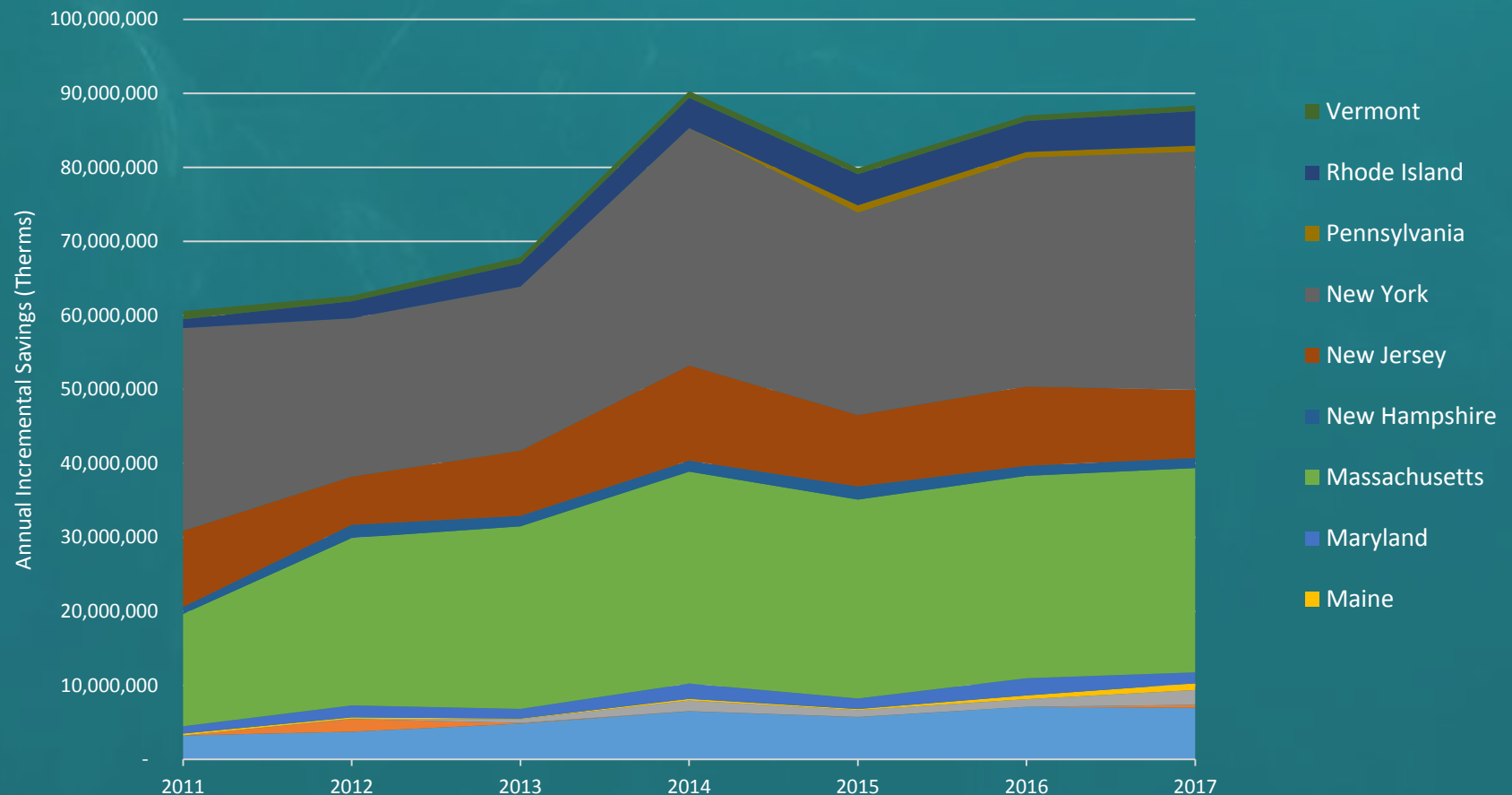


Energy Efficiency Policies and Goals

Growing Natural Gas Energy Savings



Annual incremental gas energy savings from energy efficiency programs in the region have also grown from 2011 to 2017, increasing from 60.6 million therms in 2011 to 88.3 million therms in 2017.



Sources: Combination of NEEP's REED Database and ACEEE Scorecard.

Public Policy Advancements

Leading to Advanced Energy Efficiency



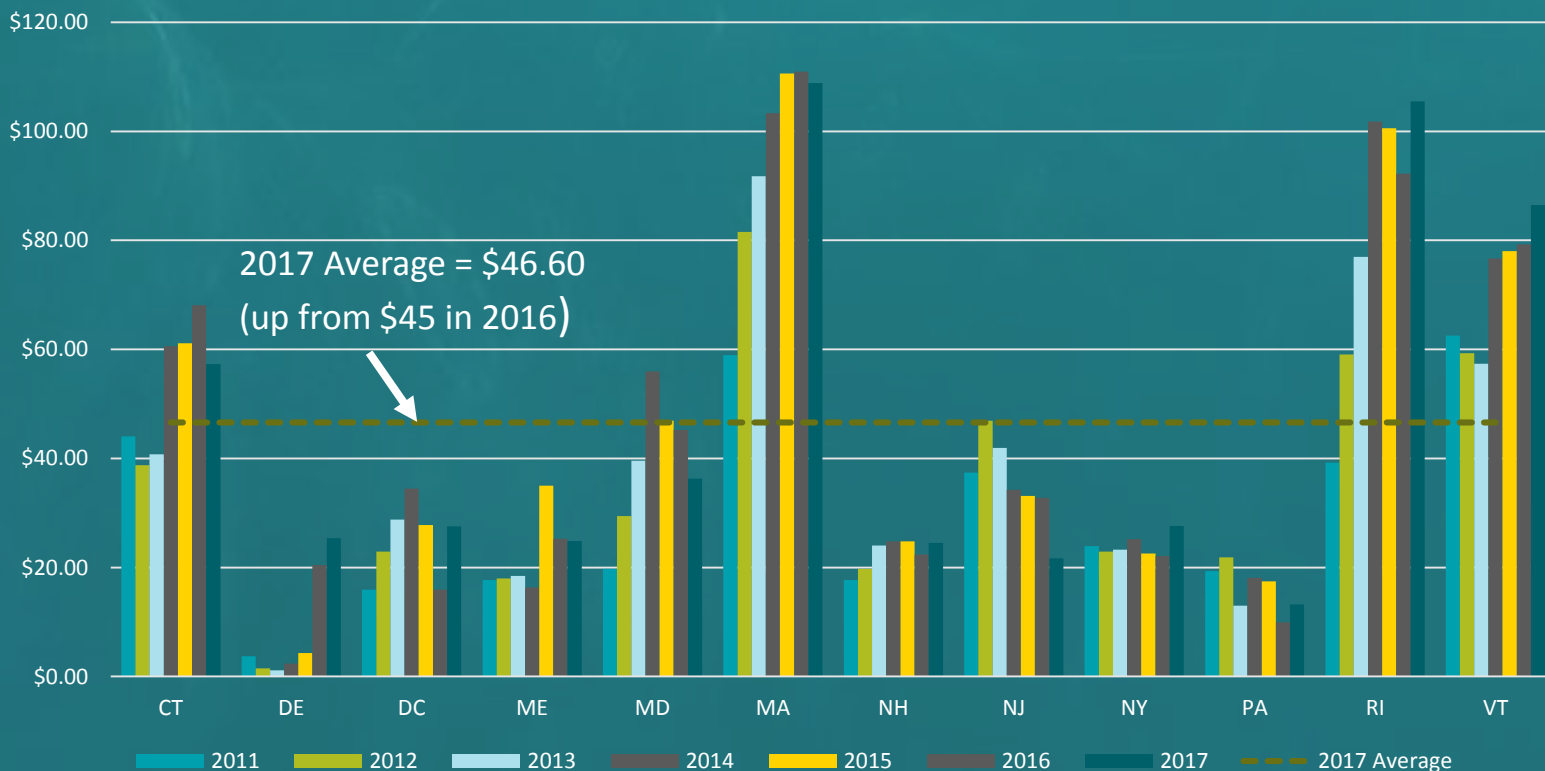
STRATEGIES	ADVANCED EFFICIENCY POLICY AND PROGRAMS	HIGHLIGHTED STATES
New Utility Business Models	Developing in order to ensure utilities remain profitable and remain in accordance with new state policies aimed at achieving carbon reduction and a cleaner, cheaper, and more reliable energy system.	NY, RI
Grid Modernization	Examining new utility frameworks responsive to emerging technologies/societal challenges and anticipating proliferation of multi-directional power flows, while also emphasizing greater customer engagement.	CT, MA, NH, NY, PA
Strategic Electrification	Powering end-uses with electricity instead of fossil fuels in a way that increases energy efficiency and reduces pollution, while lowering costs to customers and society, as part of an integrated approach to deep decarbonization.	CT, MA, ME, NY, RI, VT
Innovations in Technology and Tools	Harnessing new technology and policy innovations to enhance customer understanding about energy usage through expanded energy data access, information communication technologies, and strategic energy management strategies.	CT, MA, NY, RI, VT
Integrating Energy Efficiency and Demand Response	Pairing energy efficiency program planning with opportunities for demand response in a manner that enhances cost-effectiveness and reduces peak load growth.	ME, PA, RI
Advanced Measurement and Verification	<p>“Smart” meters and devices provide rapid feedback on energy usage data of at least hourly time resolution. These technologies paired with the availability of inexpensive computing power and software capable of learning are referred to as Advanced M&V.</p> <p>While still emerging, Advanced M&V tools hold great promise in automating or streamlining processes, reducing the time and cost involved and delivering comparable if not greater accuracy.</p>	CT, MD, NY
Evolution of Financing Tools and New Funding Mechanisms	<p>Leveraging private capital investments to increase funding available for energy efficiency programs through the use of Green Banks and related credit facilities.</p> <p>Exploring new funding mechanisms for energy efficiency strategies that expand beyond ratepayer funded programs, such as carbon pricing.</p>	CT, MA, RI
Advanced Building Policies	Shifting toward a whole-building approach to efficiency emphasizing advanced building energy codes, code compliance mechanisms, and building energy rating and labeling practices that drive toward “zero energy.”	MA, MD, ME, RI, NY, VT,

Per Capita Energy Efficiency Investments

Electric and Natural Gas Programs Combined



Efficiency investments are increasing across New England and the Mid-Atlantic. In 2017, combined efficiency program investments averaged \$46.60 per capita.



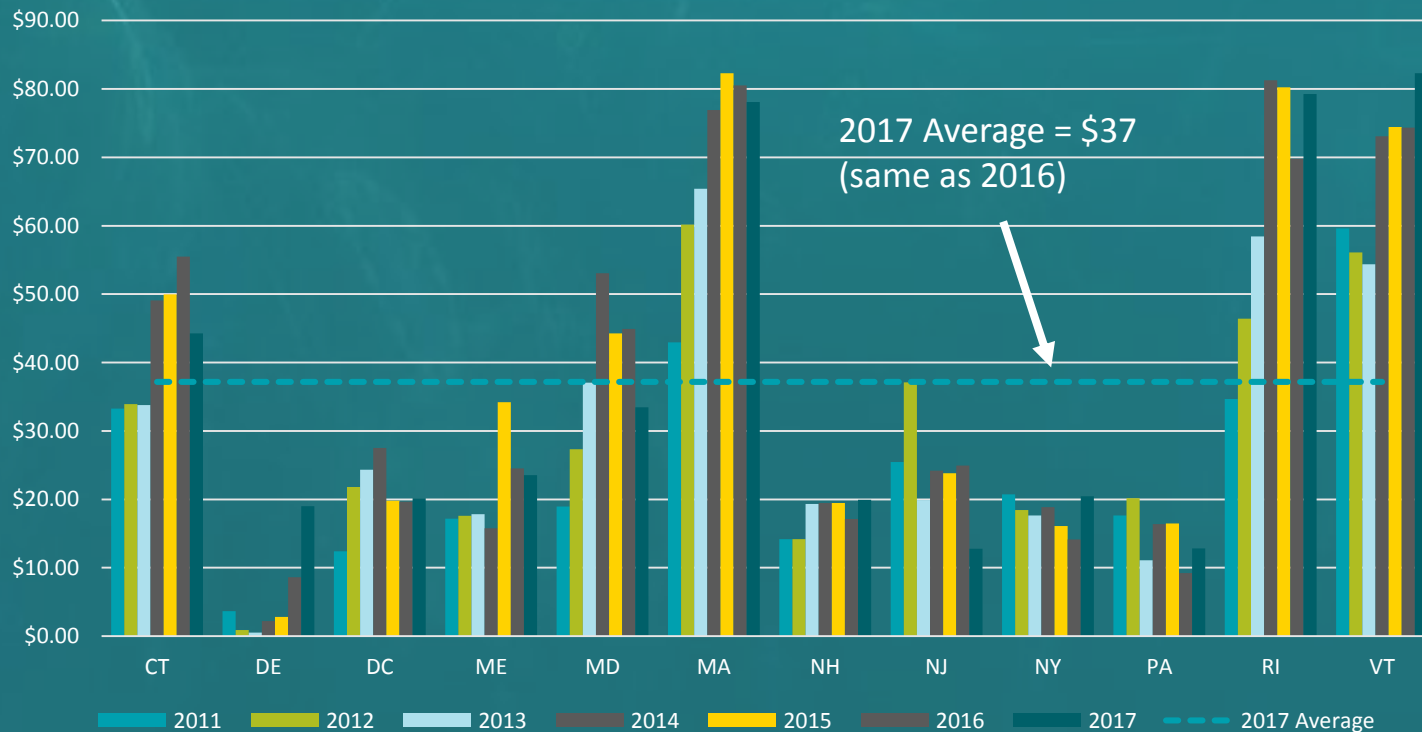
Sources: A combination of NEEP's [REED Database](#), ACEEE Scorecard, and EIA Form 861. For information on which program administrators are included in REED, please see the [REED Footnotes](#).

Per Capita Energy Efficiency Investments

Electric Programs, 2011-2017



Most per capita energy efficiency investments in the NEEP region are directed toward electric programs, largely because avoided costs for electricity are higher than for natural gas.



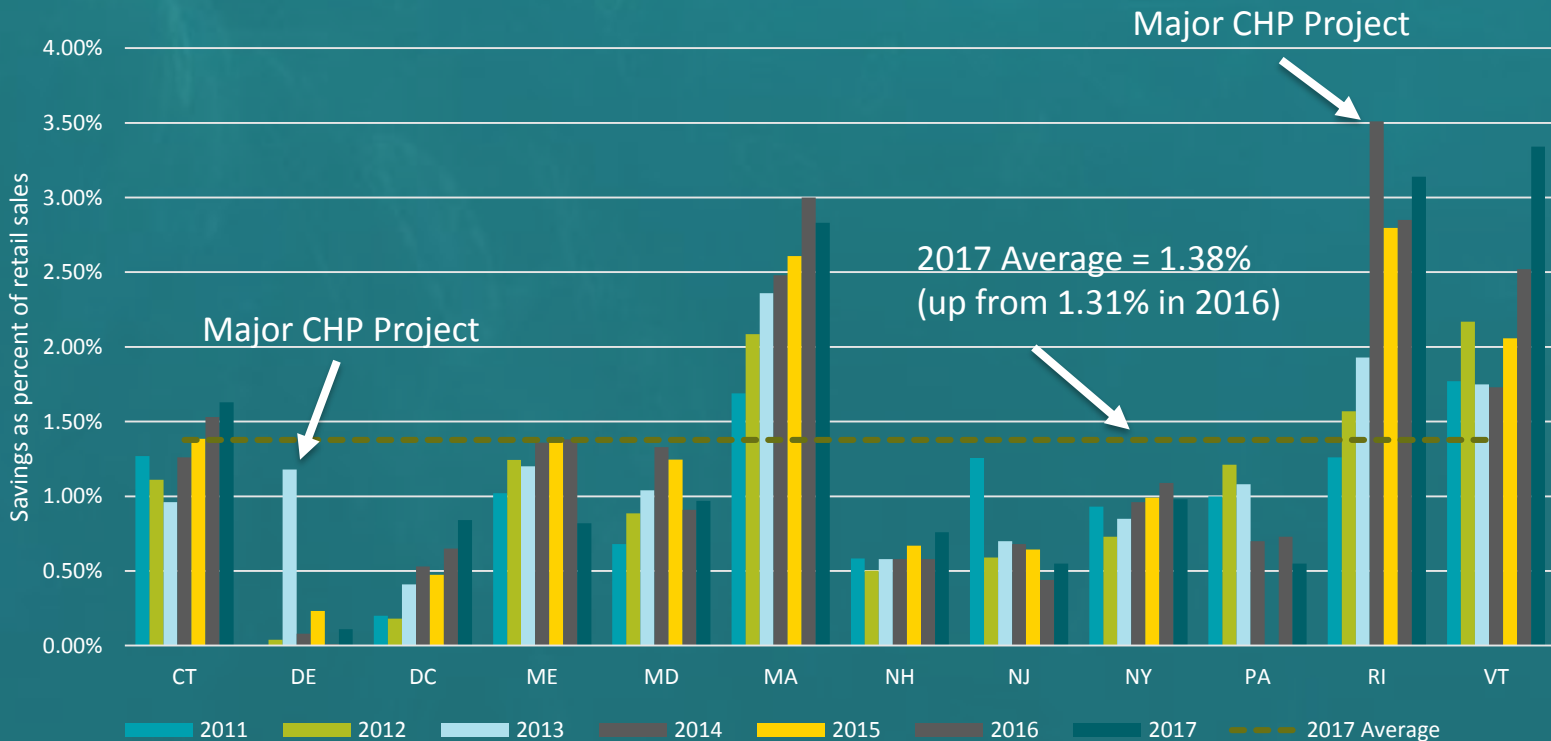
Sources: A combination of NEEP's [REED Database](#), EIA Form 861, and ACEEE Scorecard. For information on which program administrators are included in REED, please see the [REED Footnotes](#).

Savings as a Percent of Retail Sales

Electric Programs, 2011-2017



Thanks to policy leadership, electric energy savings as a percent of sales has increased for many states over the years, with Vermont and Rhode Island achieving **more than 3 percent of annual electric sales in 2017**. Combined Heat and Power (CHP) projects, such as those in RI and DE, have been used to encourage large customer participation in programs.

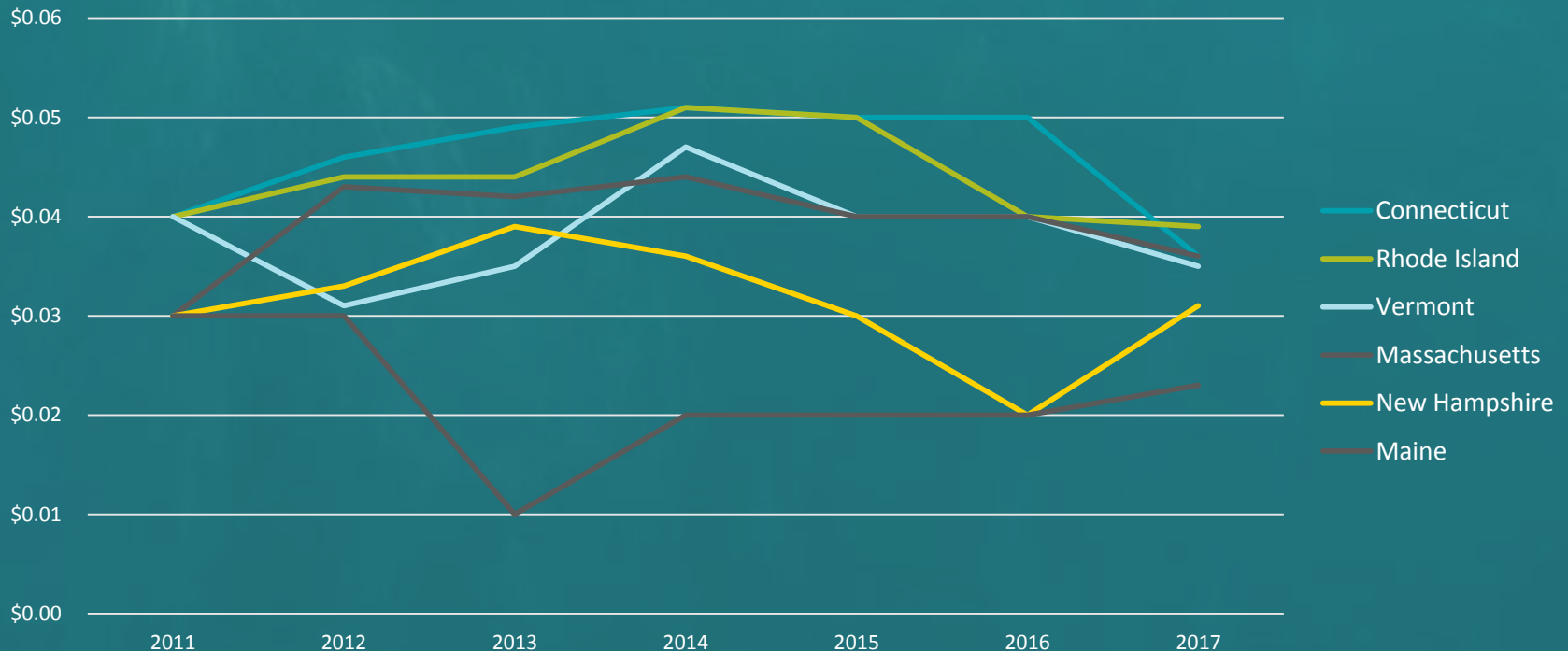


Sources: A combination of NEEP's [REED Database](#) and ACEEE Scorecard. For information on which program administrators are included in REED, please see the [REED Footnotes](#).

Levelized Cost of Saved Electricity: *LCOE per kWh, New England States*



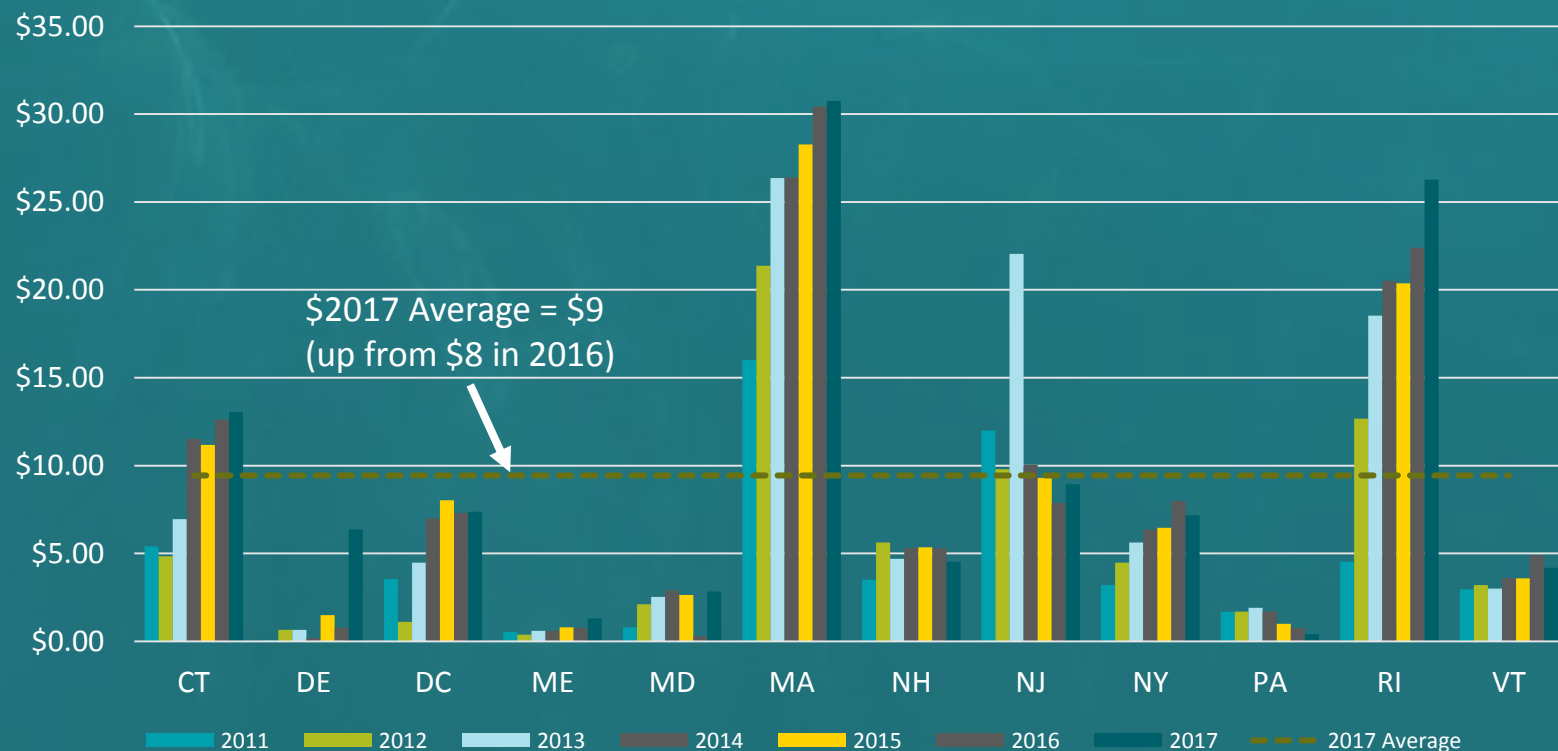
While the cost of saved energy may vary according to state-specific factors such as program scale, maturity, and depth, one thing remains constant: **the cost of saved energy is a fraction of the cost of retail electricity, which is more than \$0.17**. The LCOE figures in this graph are based on a consistent discount rate across states, derived from the long-term U.S. treasury bond.



Per Capita Investment

Natural Gas Programs, 2011-2017

On a per capita basis, investments in gas efficiency programs in the region are generally lower than investments in electric efficiency. Several states in our region lack a statewide gas distribution level infrastructure.

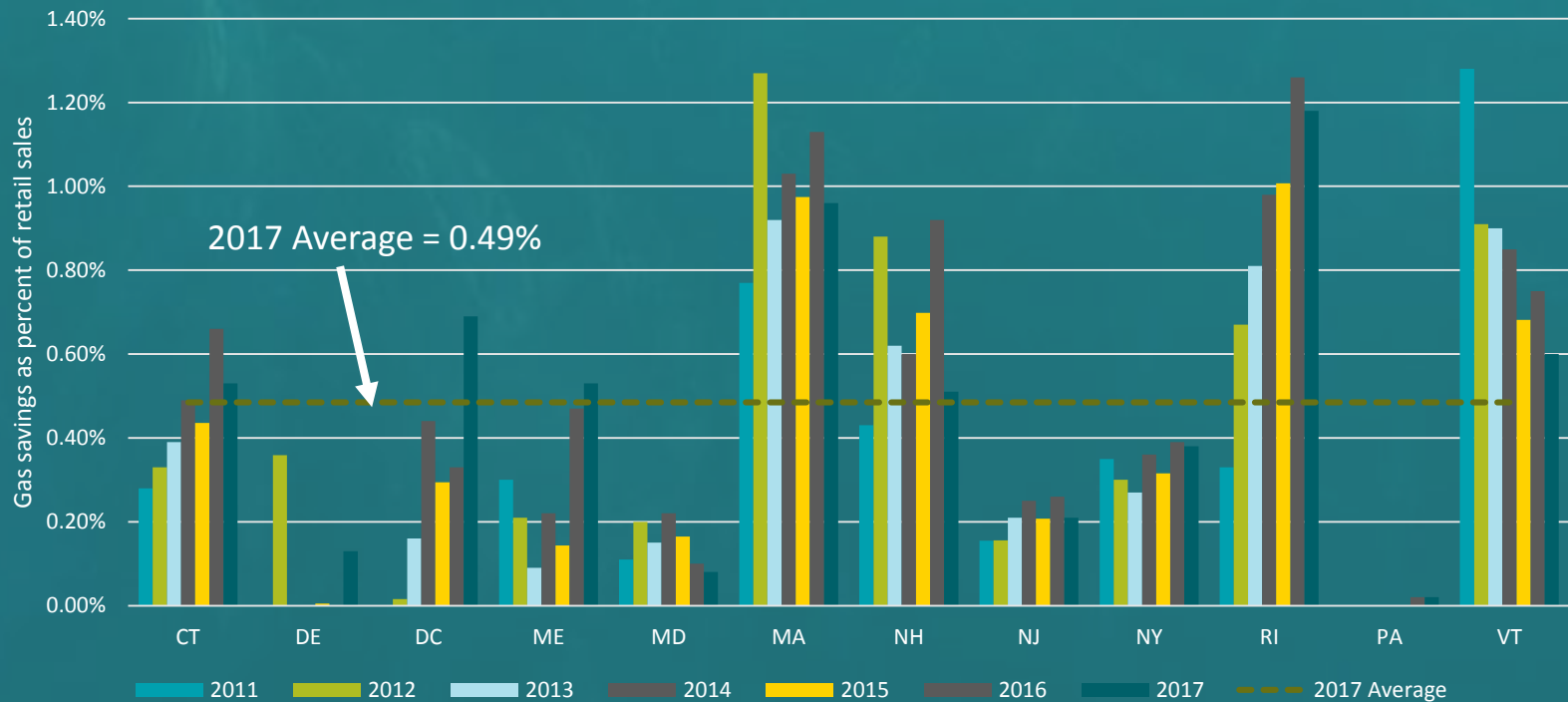


Sources: A combination of NEEP's [REED Database](#) and ACEEE Scorecard. For information on which program administrators are included in REED, please see the [REED Footnotes](#).

Savings as a Percent of Retail Sales

Natural Gas Programs, 2011-2017

For natural gas programs, leading states are achieving energy savings of about one percent of retail sales, with RI exceeding that mark in 2017 with 1.18 percent. In 2017, the region averaged 0.49 percent of retail sales, comparable to the 0.52 percent achieved in 2016.



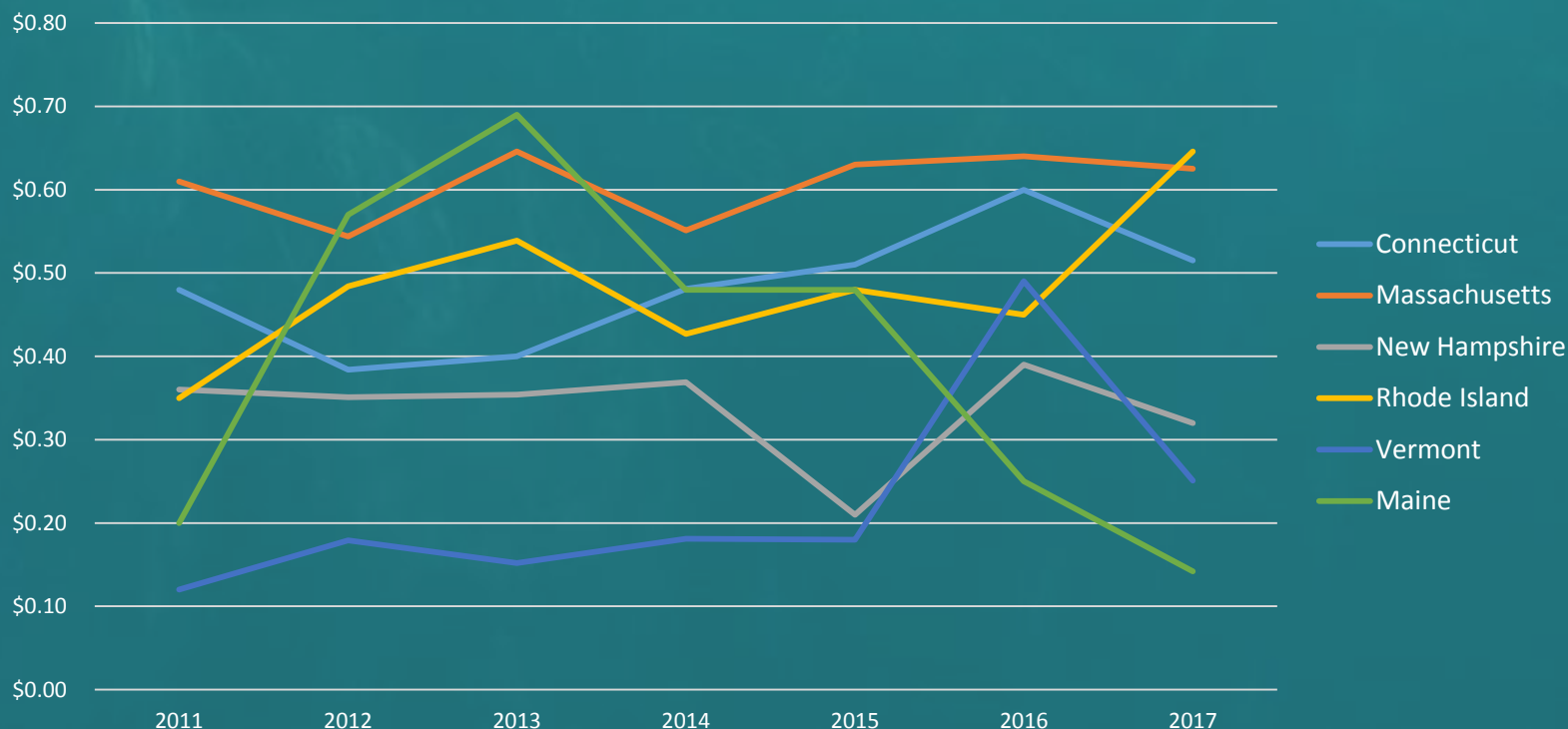
Sources: A combination of NEEP's [REED Database](#) and ACEEE Scorecard. For information about which program administrators are included in REED, please see the [REED Footnotes](#). *While Pennsylvania doesn't claim savings for programs run by any regulated program administrator, the Department of Environmental Protection does fund gas efficiency incentives for consumers.

Levelized Cost of Saved Natural Gas

LCOE Per Therm, New England States



The levelized cost of saved energy per therm decreased in many New England states from 2016 to 2017, which may be related to program expansion. In all cases, **the cost of energy savings is far less than the cost of retail natural gas, which is more than \$1/therm.**



Source: NEEP's [REED Database](#). For further information, see the NEEP REED [Footnotes](#) page.

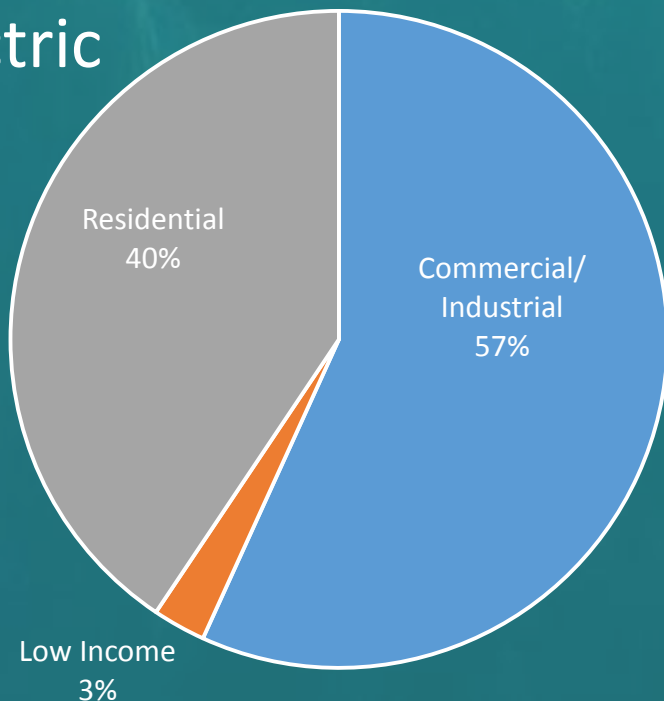
Energy Savings by Sector

Natural Gas and Electric, 2017

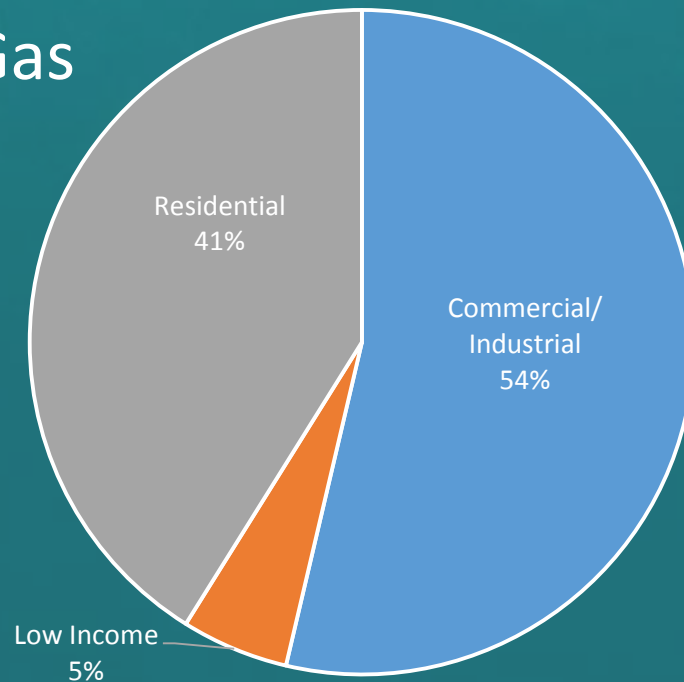


Electric and natural gas programs had a similar breakdown of savings from each sector in 2017, with the majority coming from the Commercial and Industrial sector. Substantial savings were also achieved in the residential sector, with a small portion coming from the low-income sector.

Electric



Gas



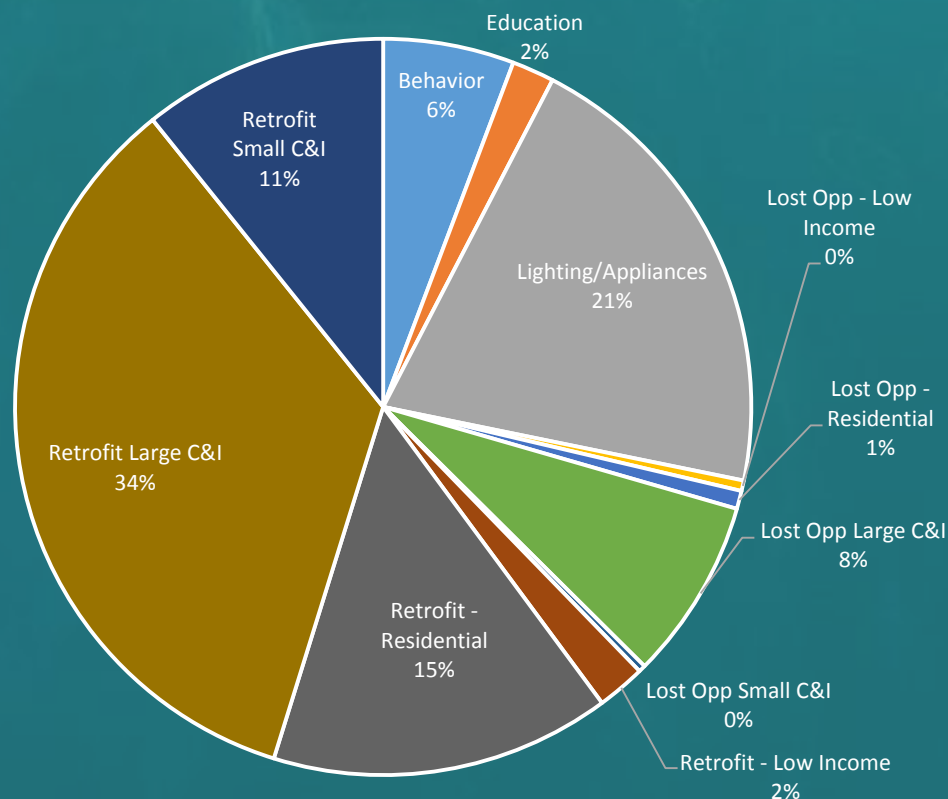
Savings by Program Type

Natural Gas and Electric, 2017

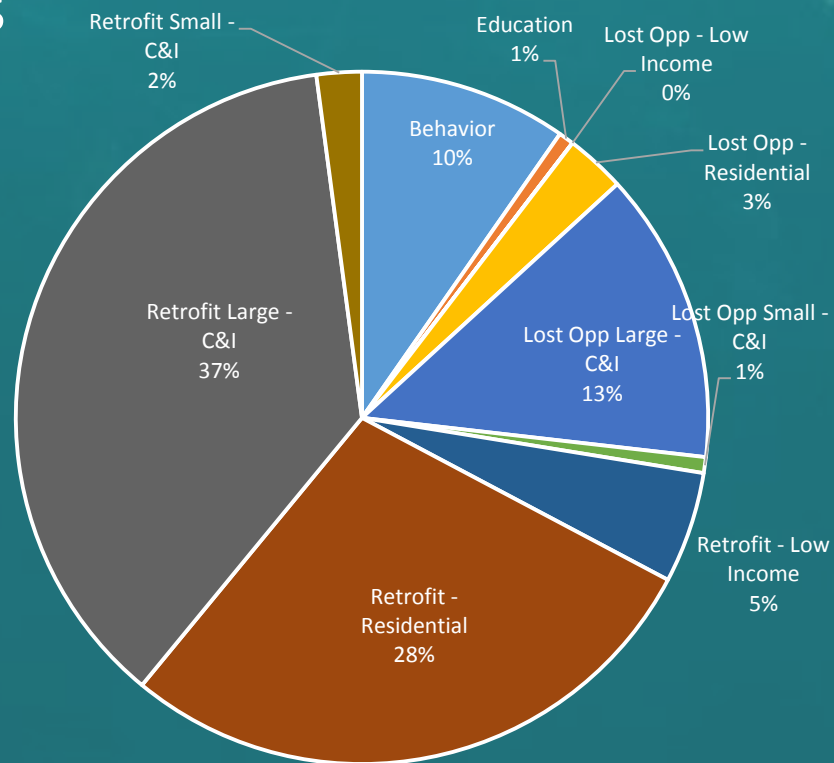


Electric programs achieved the majority of their savings from lighting, appliances, and large commercial and industrial (C&I) retrofits. A large amount of natural gas program savings also came from large C&I retrofits, with residential retrofit programs contributing significant savings as well.

Electric



Gas



Fuel Switching in the NEEP Region

Fuel-switching (*replacing inefficient fuels with cleaner and economical alternatives*) has become an important approach to reducing energy consumption and costs for end-users, while also curbing carbon emissions. Some states are considering or have already adopted fuel-neutral savings goals (overall savings goals for energy or GHG emissions that don't specify the resource the energy savings must come from).

State Highlights

New York: Fuel-neutral goal: 185 TBtus total annual site energy savings from 2015–2025, relative to forecast energy consumption in 2025. Plus an electricity sub-target for electric efficiency savings to hit 3% of sales by 2025, and a clean heating target.

Massachusetts: 2019-2021 Plan includes a fuel-neutral goal, GHG reduction and net benefits goals, and annual and lifetime resource-specific goals. The 2018 Act to Advance Clean Energy broadened EE to focus on reducing overall energy use (strategic electrification, fuel conversion to renewable energy sources and other clean energy technologies). PAs will not recommend one fuel over another, but rather provide education about environmental costs and benefits of fuel switching measures.

State Carbon Reduction Goals



NEEP's mission is to assist states achieve region-wide carbon reduction of 40% by 2030 and 80% by 2050

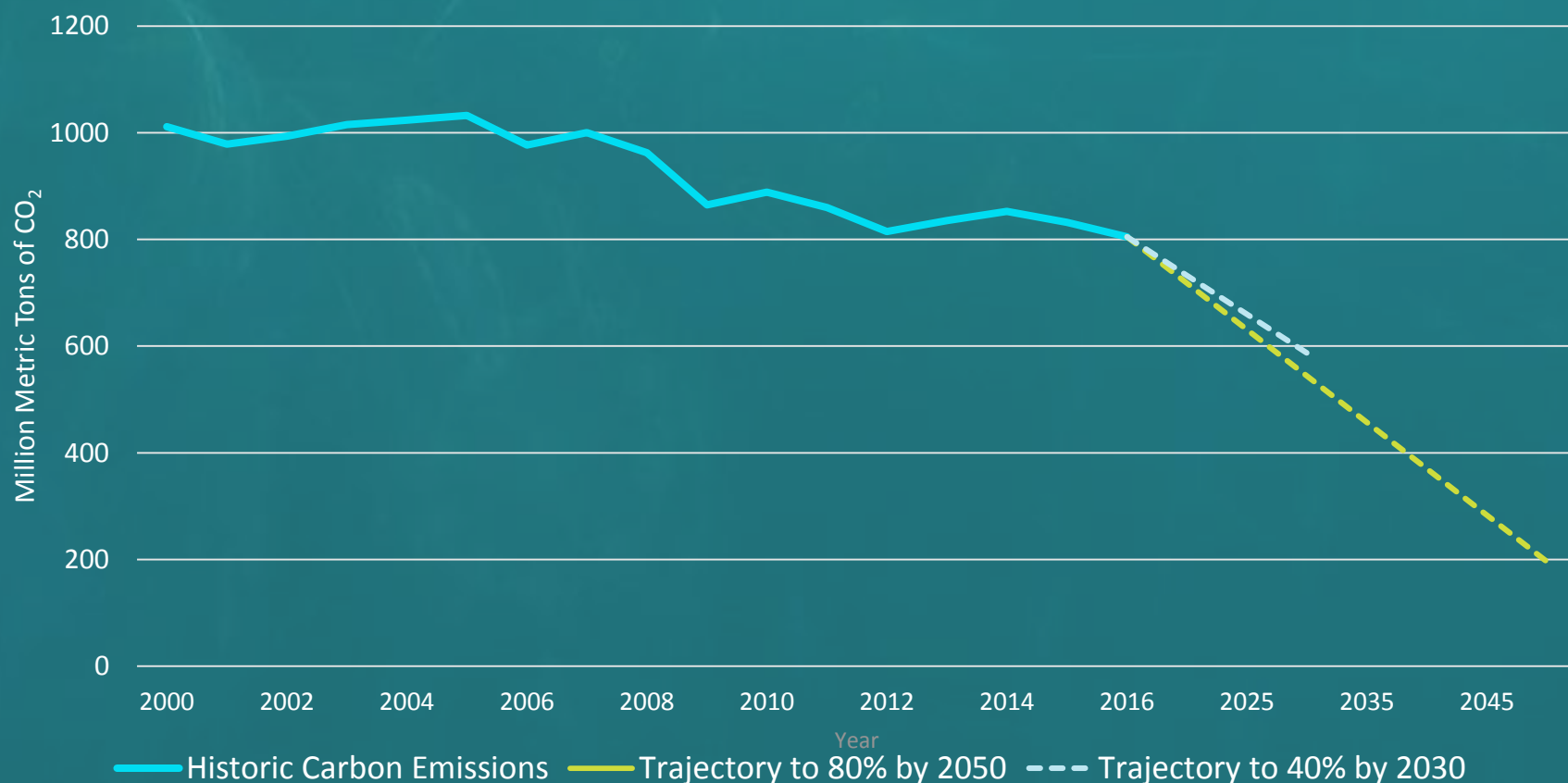
State	Near-term Goal	Interim Goal	Long-term Goal
Connecticut	10% by 2020	45% by 2030	80% by 2050
Delaware	30% by 2030		
Maine	10% by 2020	45% by 2030	80% by 2050
Maryland	25% by 2020	40% by 2030	
Massachusetts	25% by 2020		80% by 2050
New Hampshire	10% by 2020	20% by 2035	80% by 2050
New Jersey	Stabilize by 2020		80% by 2050
New York	40% by 2030		85% reduction + 15% carbon capture = carbon neutral by 2050
Pennsylvania	33% by 2030		
Rhode Island	10% by 2020	45% by 2035	80% by 2050
Vermont	50% by 2028		75% by 2050
Washington D.C.	50% by 2032		80% by 2050

Regional Carbon Emissions

Getting to 40 % by 2030 and 80% by 2050



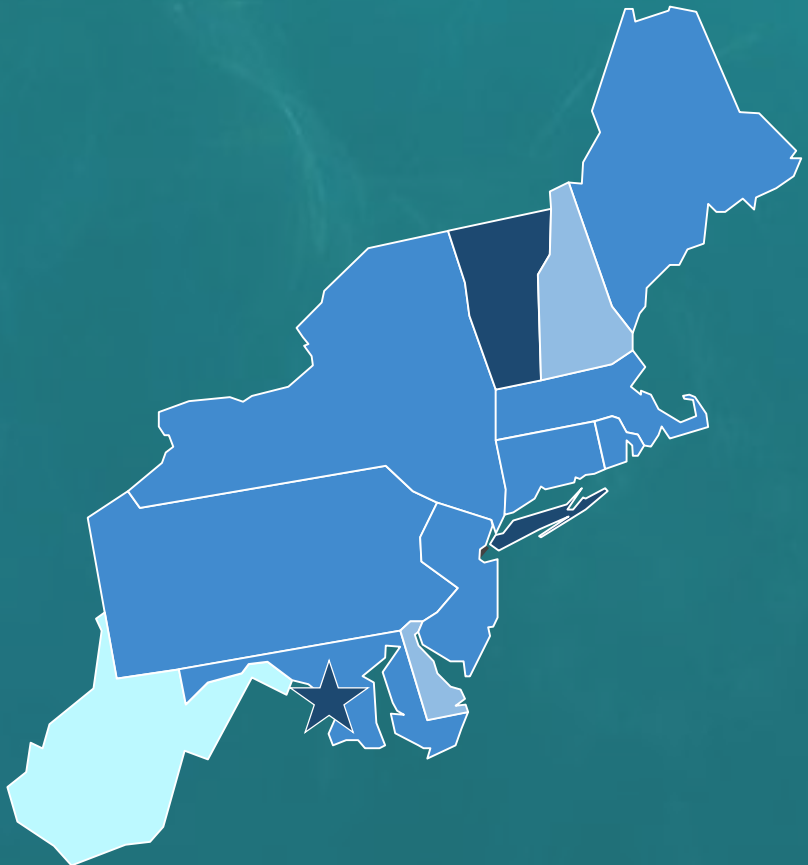
The region has achieved some carbon reduction, but in order to achieve 80 percent by 2050 from all sectors, states need to invest further in energy efficiency, strategically electrify end-uses (building HVAC and transportation) and power the grid with renewable energy.



Northeast Region's Aggressive Carbon Reduction Targets

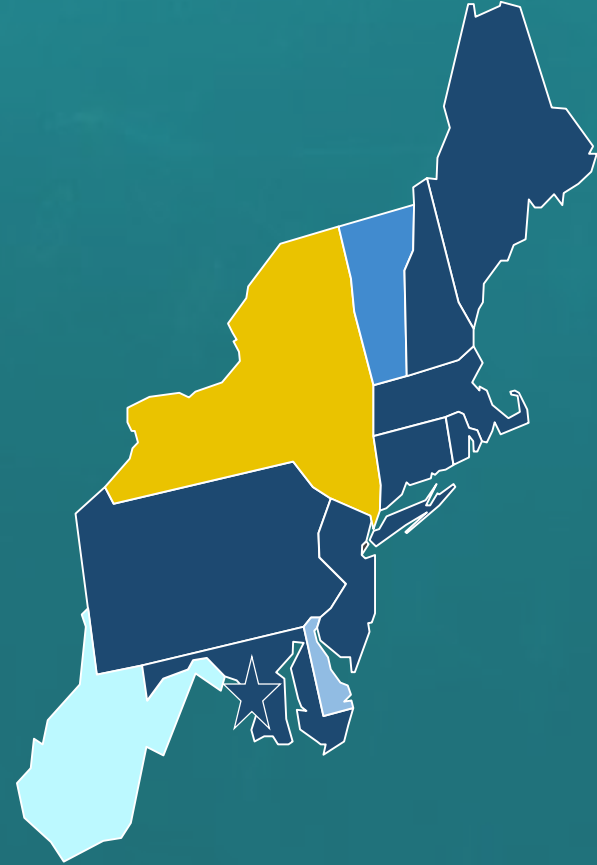


Carbon Reductions Goals by 2030



Carbon Reduction 2030
*By predetermined baseline
N/A <30% <45% 50%

Carbon Reductions Goals by 2050

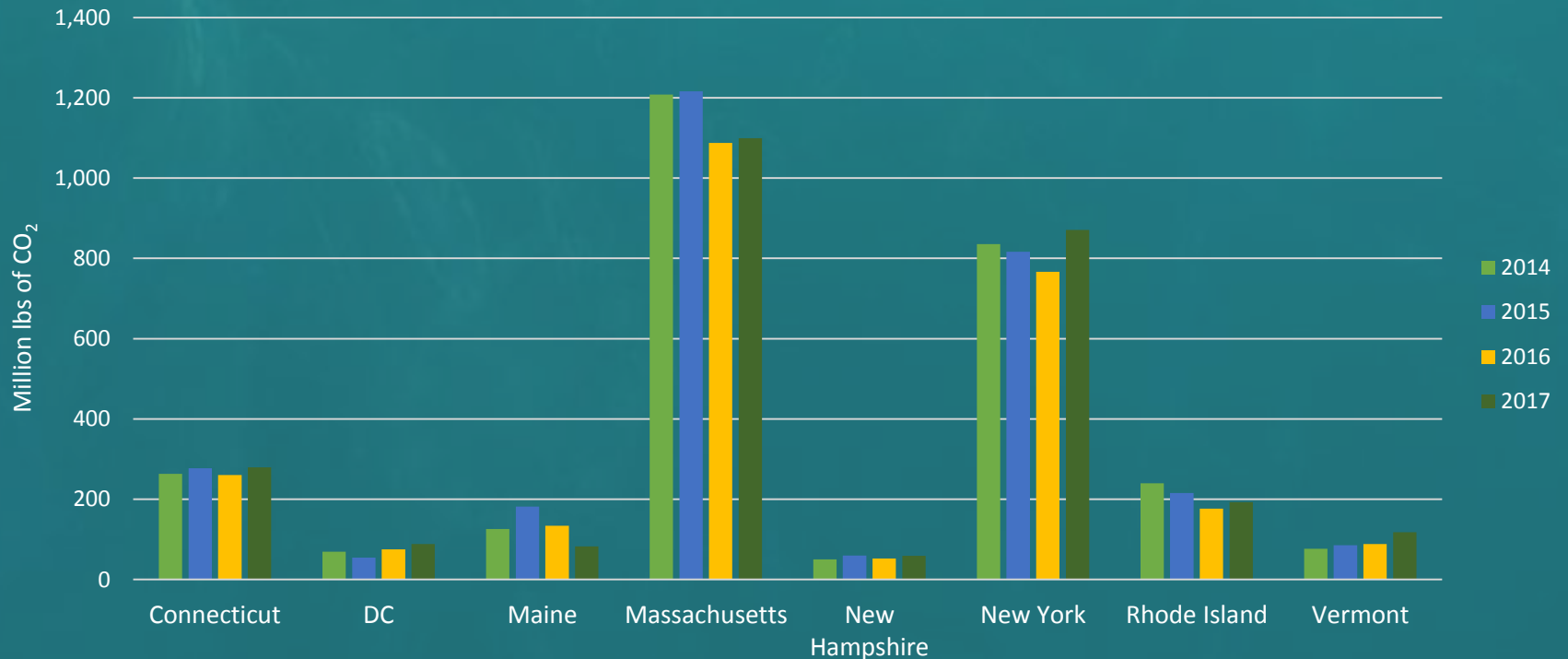


Carbon Reduction 2050
*By predetermined baseline
N/A <65% 75% 80% 100%

Energy Efficiency Leads to Avoided Carbon



The states reporting to REED in 2017 avoided **2.8 billion pounds of carbon emissions** from energy efficiency programs. According to the [EPA's Greenhouse Gas Equivalency Calculator](#), this is equivalent to carbon emissions from 220,651 homes' annual electricity use or 268,641 passenger vehicles driven for one year.



Identifying Trends in Regional Data

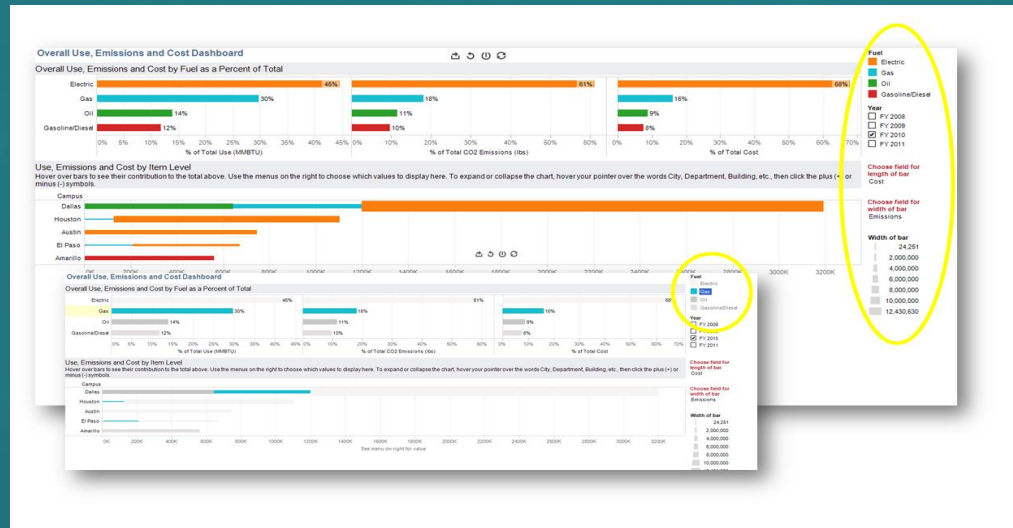
The Regional Energy Efficiency Database (REED)



Data collected by NEEP includes program years 2011 through 2017 for these jurisdictions: CT, DC, DE, MA, MD, NH, NY, RI and VT.

REED includes:

- Annual & Lifetime Electric and Gas Energy Savings
- Peak Demand Savings
- Avoided Air Emissions
- Program Expenditures
- Job Creation Impacts
- Cost of Saved Energy
- Program Funding Sources
- Supporting Information



More from NEEP

A Sample of Reports at [NEEP.org/Resources](https://nEEP.org/Resources)



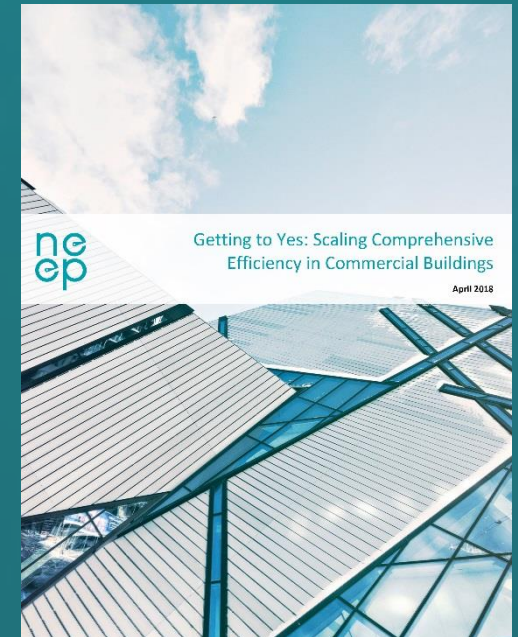
The Smart Energy Home: Driving Residential Building Decarbonization March, 2019



Readiness for Advanced Measurement and Verification in the Northeast May, 2019



Getting to Yes: Scaling Comprehensive Efficiency in Commercial Buildings April, 2018



New Resource Coming Soon: NEEP's Policy Framework

Please visit [NEEP's Blog](https://nEEP.org/blog) for the latest news and insights.

Questions?



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