



Energy Efficiency Snapshot

Summer 2018

“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



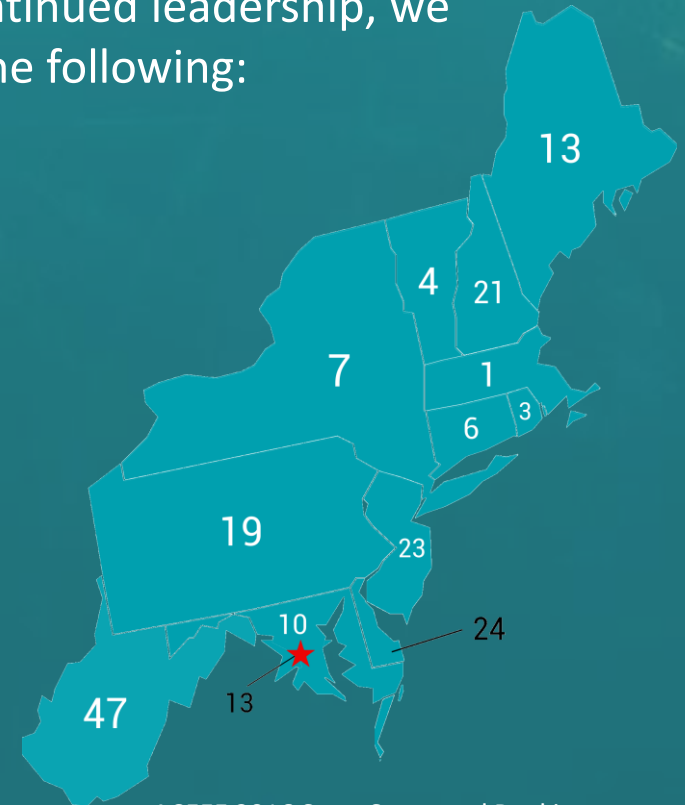
NEEP's Annual Snapshot

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



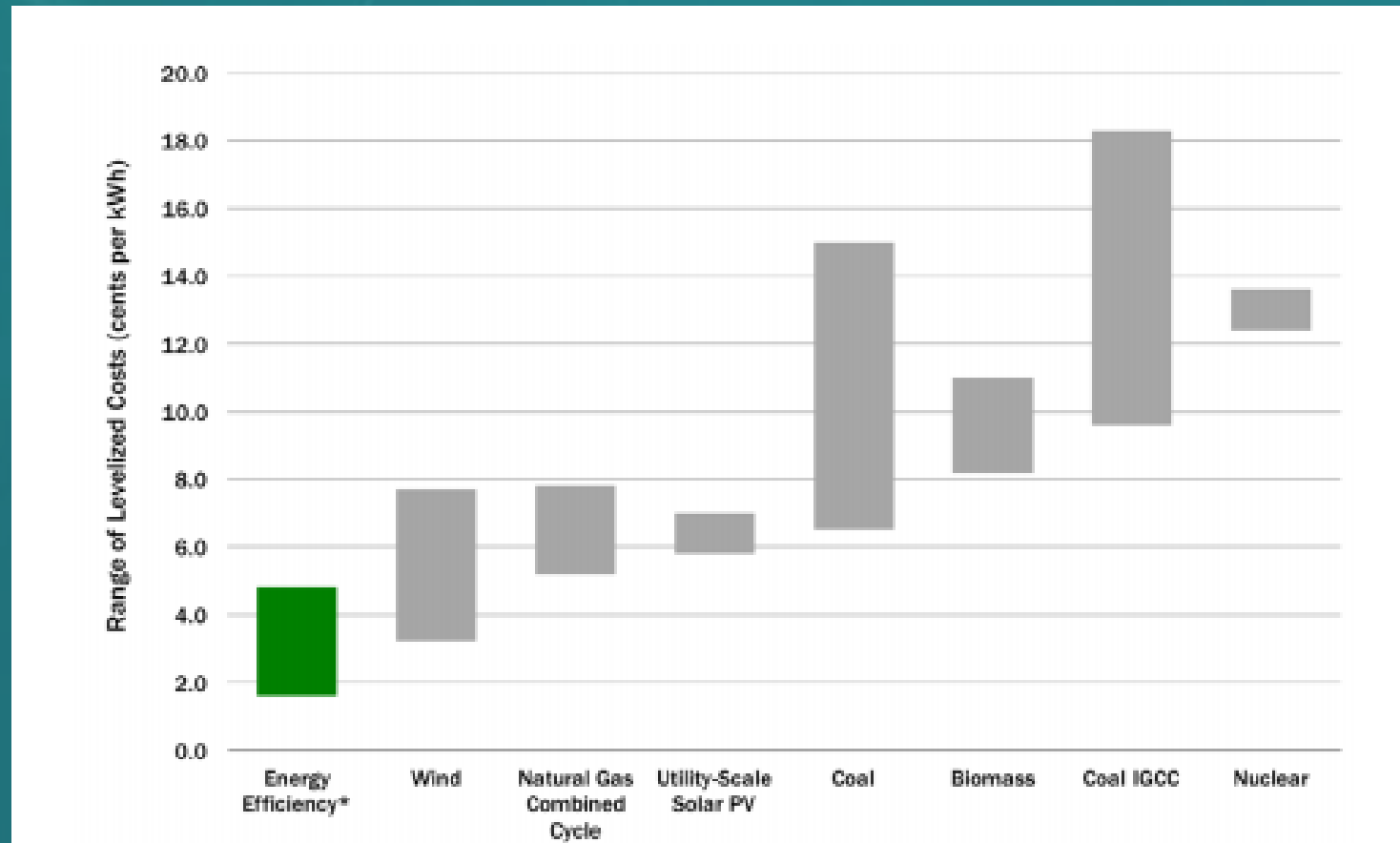
ACEEE 2016 State Scorecard Rankings

The figures in this presentation are compiled from the Regional Energy Efficiency Database (REED), program administrator plans, annual reports, U.S. EIA, and ACEEE.

Energy Efficiency

The Least-Cost Energy Resources

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.



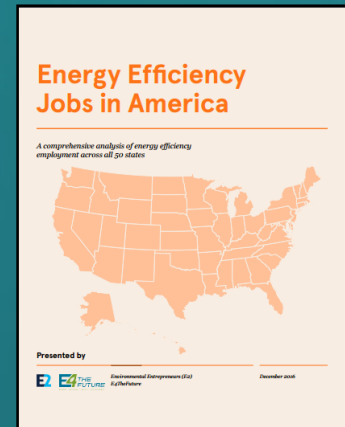
Energy Efficiency as an Economic Driver

Job Creation and Economic Growth

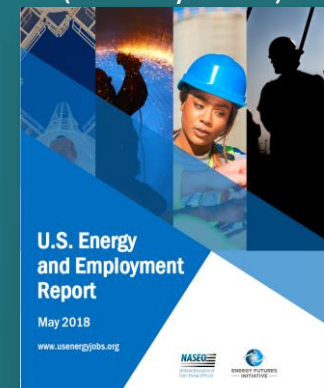


	Percent Total Population Employed By EE	Total Direct Jobs in Energy Efficiency
DC	2.12%	14,681
VT	1.38%	8,585
MA	1.21%	82,848
MD	0.77%	46,724
RI	0.77%	8,112
ME	0.66%	8,843
NH	0.51%	6,833
NJ	0.43%	38,378
PA	0.42%	53,175
NY	0.35%	69,704
CT	0.35%	12,460
DE	0.24%	2,334

Source: E2/E4TheFuture
Energy Efficiency Jobs in America
 (December 2016)



Resource: NASEO & EFI
U.S. Energy and Employment Report
 (January 2018)



Energy Efficiency Policies and Goals

New England States



STATE	POLICY TYPE	PROGRAM ADMINISTRATOR	ENERGY SAVINGS GOALS
Connecticut	<u>All Cost-Effective Energy Efficiency</u>	Electric & Gas Utilities <u>2016-18 Plan</u> • <u>2018 update</u>	Electric: 1.5% retail sales Gas: 0.6% retail sales (forecasted retail sales)
Maine	<u>All Cost-Effective Energy Efficiency</u>	Efficiency Maine Trust <u>2017-19 Plan</u> <u>Budgets and Metrics</u>	Electric: incremental savings targets of ~2.4%/year for 2017-2019. Gas: Incremental savings of ~0.2%/year 2017-2019
Massachusetts	<u>All Cost-Effective Energy Efficiency</u>	Electric & Gas Utilities + CLC <u>2016-18 Plan</u> <u>Term Sheet</u>	Electric: 2.93% retail sales Gas: 1.24% retail sales (forecasted retail sales)
New Hampshire	<u>All Cost-Effective Energy Efficiency</u>	Electric & Gas Utilities <u>2018-2020 plan</u>	Electric: 0.8% in 2018, 1% in 2019 and 1.3% in 2020 Gas: 0.7% 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> <u>Demand Resource Proc.</u>	Electric: 2.3% retail sales Gas: 0.9% retail sales (forecasted retail sales)

Energy Efficiency Policies and Goals

The Mid-Atlantic Region



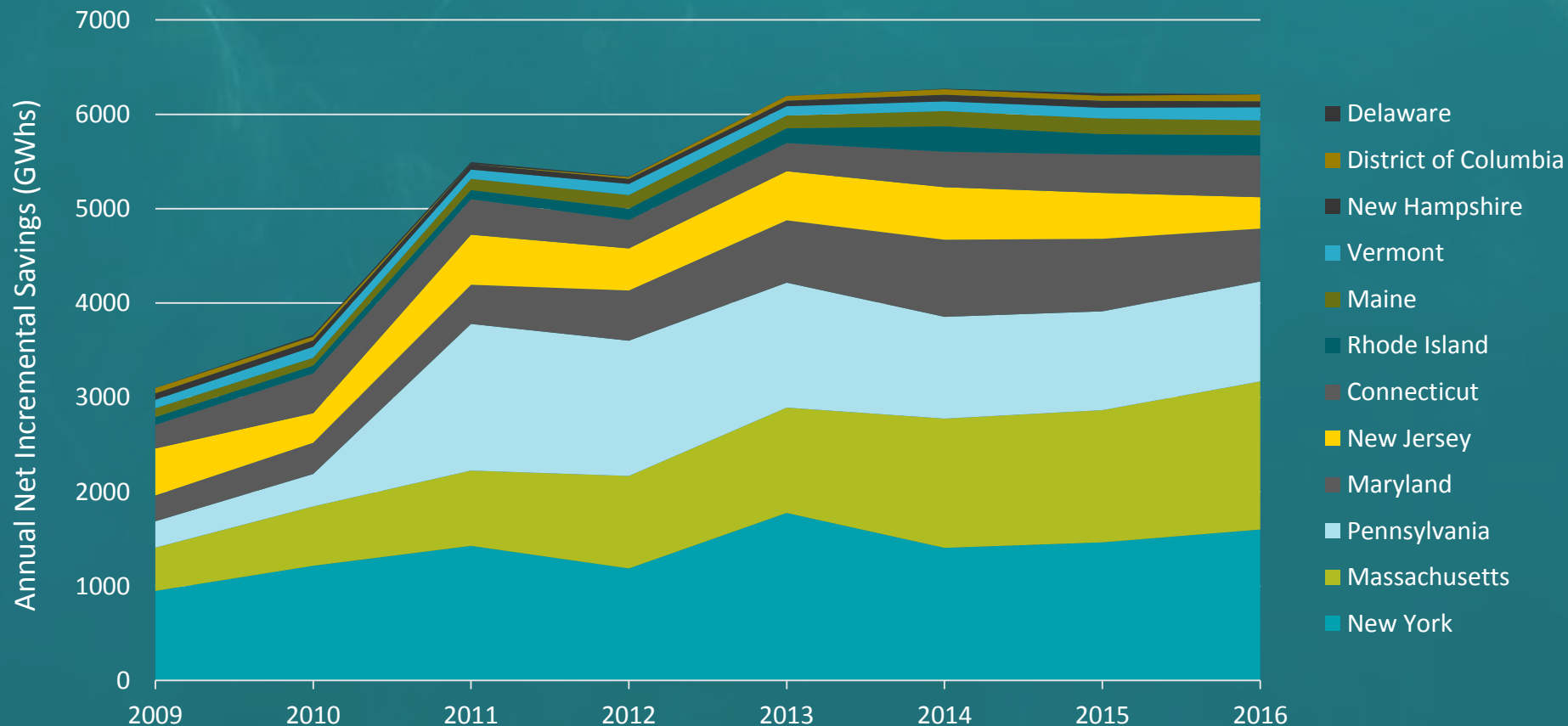
STATE	POLICY TYPE	PROGRAM ADMINISTRATOR	ENERGY SAVINGS GOALS
Delaware	<u>All Cost-Effective Energy Efficiency</u>	Utilities+ Sustainable Energy Utility	Voluntary energy savings targets (2018) Electric: 0.7% Gas – 0.3% (2019) Electric – 1.0% Gas – 0.5%
District of Columbia	<u>Efficiency Utility Goals</u>	Sustainable Energy Utility	Electric: 0.53% retail sales Gas: 0.44% retail sales (2014 retail sales)
Maryland	<u>Energy Efficiency Resource Standard</u>	Electric and Gas Utilities <u>Order No. 87082</u> <u>Gas Working Group Targets</u>	Electric: 2.0% retail sales (<u>2020</u>) Gas: <u>Pending Proceeding</u> (2016 retail sales)
New Jersey	<u>Efficiency Funding</u>	NJCEP OCE+ Utilities <u>Strategic Plan</u>	No mandated savings goals
New York	<u>Energy Efficiency Portfolio Standard</u>	NYSERDA + Utilities <u>NYSERDA Clean Energy Fund</u> <u>Utility ETIPs</u>	incremental targets varying from 0.4% to 0.9% for 2016–2018 185 Tbtu site energy savings by 2025
Pennsylvania	<u>Energy Efficiency & Conservation (EE&C) plans</u>	Electric Utilities <u>Act 129 Phase III</u>	Average electric savings of approximately 3.7% (range of 2.6% to 5.0%) from EE between 2016-2021; no gas

Energy Efficiency Policies and Goals

Provide Extensive Savings



Annual verified electric savings have more than doubled in recent years, moving from ~3,100 GWh in 2009 to ~6,200 GWh in 2016. This is a direct result of regulatory policies and executive leadership in states supporting energy efficiency as a first order resource.



Sources: 2013-15 data is drawn from EIA form 861. 2011-12 and 2015-2016 data is drawn from NEEP's [REED Database](#), ACEEE Scorecard/program administrator reports (D.C. Del., NJ. Pa.). 2009-12 data is drawn from ACEEE scorecards.

Advancements in Public Policy

Leading to Advanced Energy Efficiency



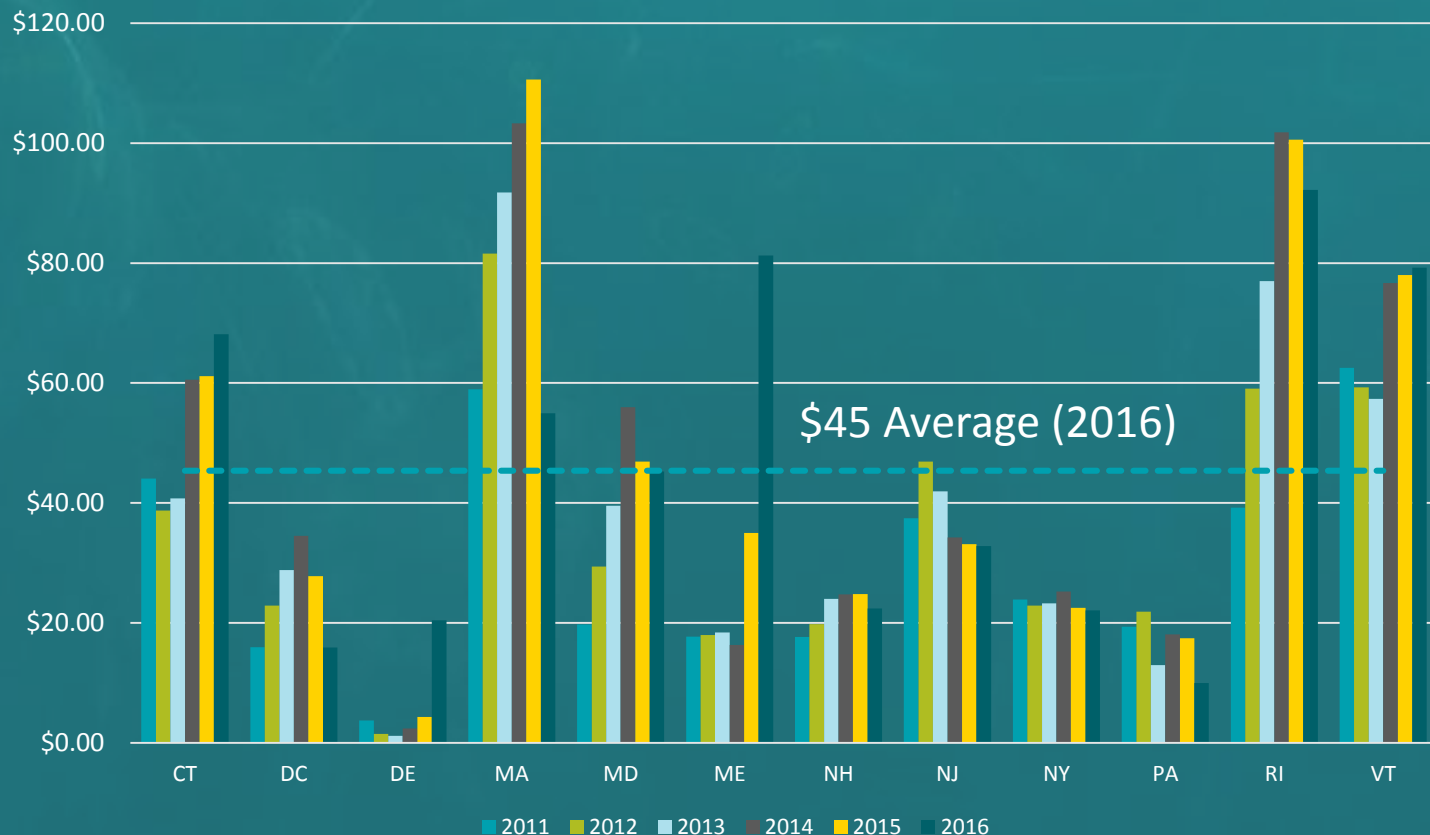
STRATEGIES	ADVANCED EFFICIENCY POLICY AND PROGRAMS	HIGHLIGHTED STATES
New Utility Business Models	Developing in order to ensure utilities remain profitable and remain in accordance with new state policies aimed at achieving carbon reduction and a cleaner, cheaper, and more reliable energy system.	NY, 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.	MA, NY, CT, NH, 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	VT, RI, NY, MA, ME, CT
Innovations in Technology and Tools	Harnessing new technology and policy innovations to enhance customer understanding around energy usage through expanded energy data access, information communication technologies, and strategic energy management strategies.	MA, VT, CT, NY, RI
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, RI, PA
Advanced Measurement and Verification	“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. 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.	CT, MD, NY
Evolution of Financing Tool and New Funding Mechanisms	Leveraging private capital investments to increase funding available for energy efficiency programs through the use of Green Banks and related credit facilities. Exploring new funding mechanisms for energy efficiency strategies that expand beyond ratepayer funded programs, such as carbon pricing.	CT, RI, MA
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.”	RI, NY, VT, ME, MD

Per Capita Energy Efficiency Investments

Electric and Natural Gas Programs Combined



Efficiency investments are increasing across New England and the Mid-Atlantic. In 2016, combined efficiency program investments will average approximately \$46 per capita.



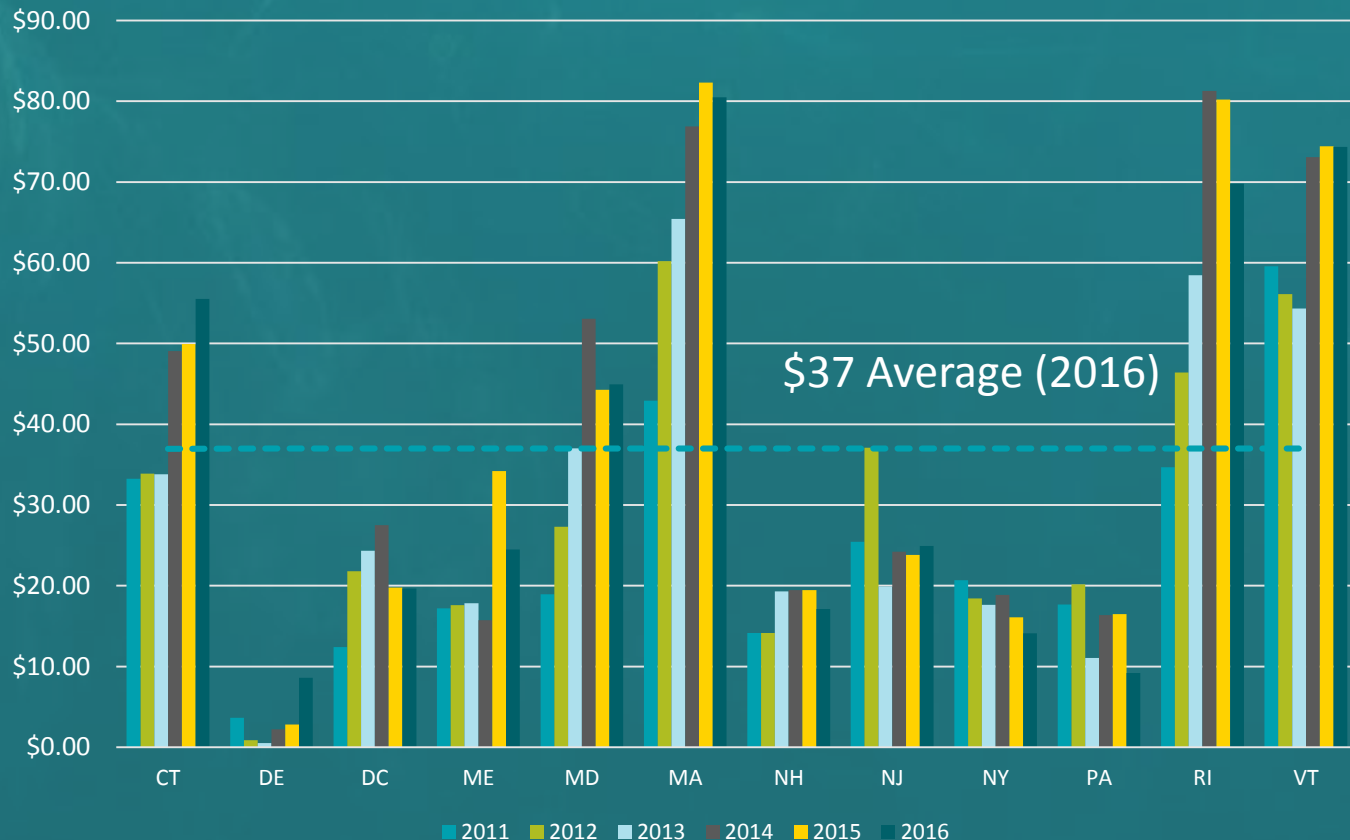
Source: 2011-16 data is drawn from NEEP's [REED Database](#) with the exception of NY, NJ, and PA, which are drawn from ACEEE Scorecard⁹ and EIA form 861. For further information on which program administrators are included in REED, please see the [REED Footnotes](#) website.

Per Capita Energy Efficiency Investments

Electric Programs, 2011-16



The overwhelming majority of per capita energy efficiency investments in our region are directed toward electric programs, largely because avoided costs for electricity are higher than they are for natural gas.



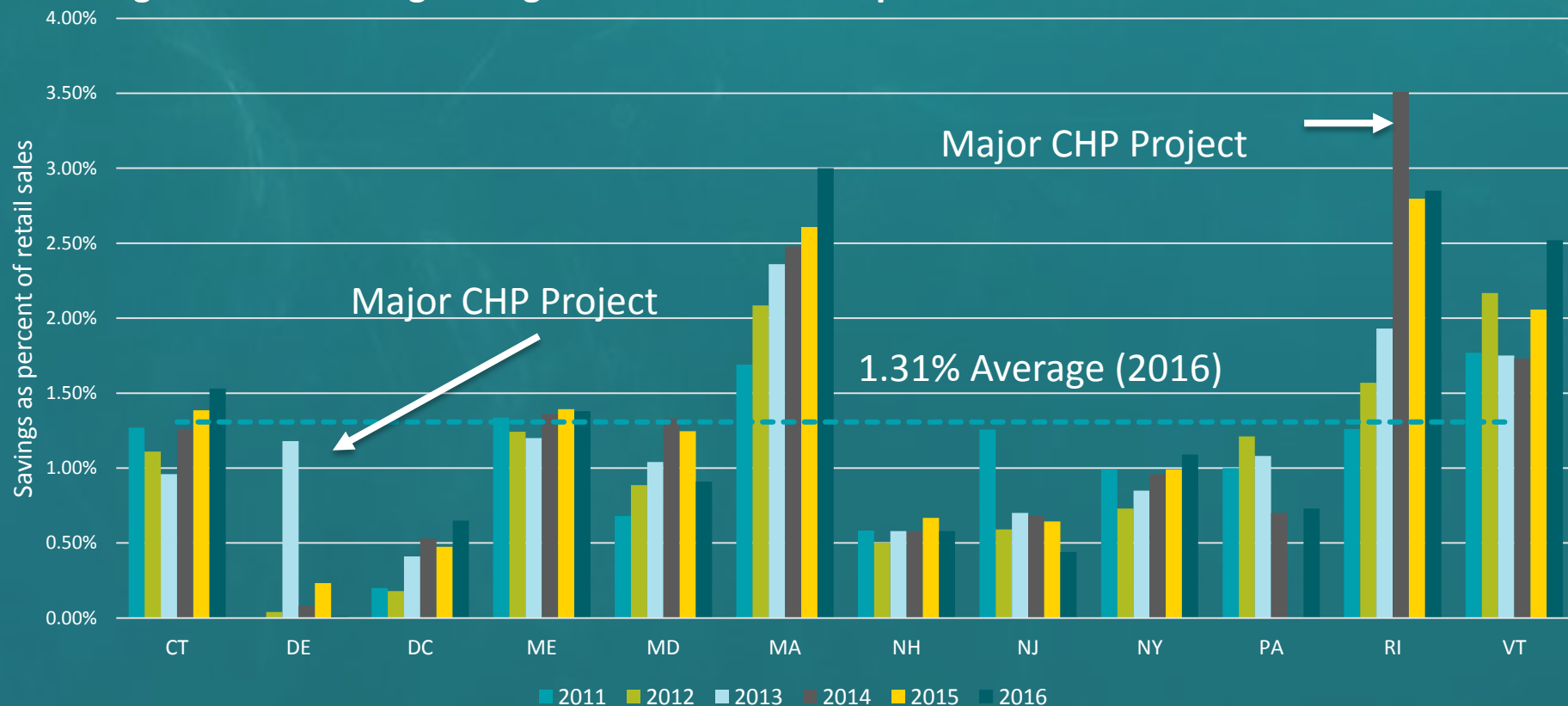
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Savings as Percent of Retail Sales

Electric Programs, 2011-16



Thanks to policy leadership, efficiency serves a growing portion of electricity demand, with leading states achieving savings of **more than two percent of annual electric sales**.



Many states, including Rhode Island and Delaware, are embracing Combined Heat and Power (CHP) to encourage large customer participation in programs. MA continues to increase savings, achieving 3% in 2016

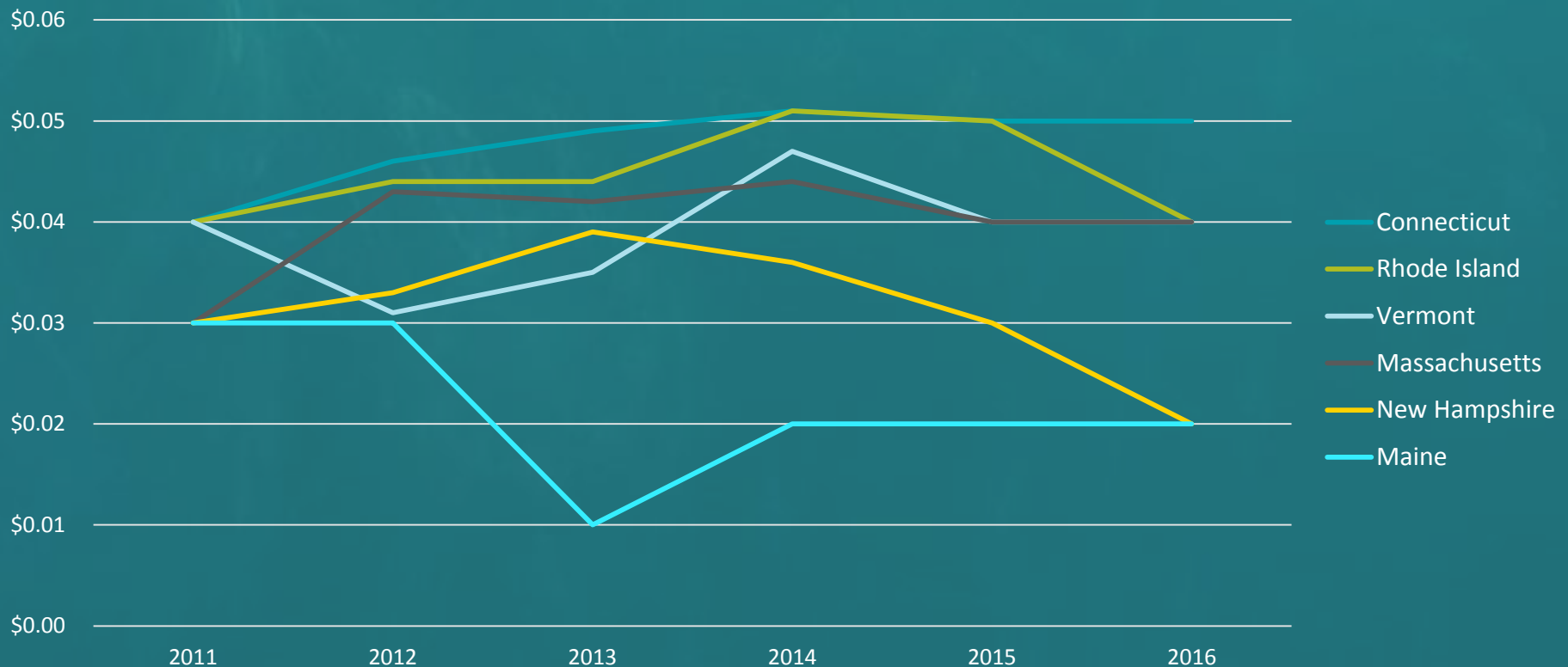
Source: 2011-16 data is drawn from NEEP's [REED Database](#) and ACEEE's Scorecard. For further information on which program administrators are included in REED, please see the [REED Footnotes](#) website.

Levelized Cost of Saved Electricity:

LCOE per kwh, New England States



While the costs 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 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.

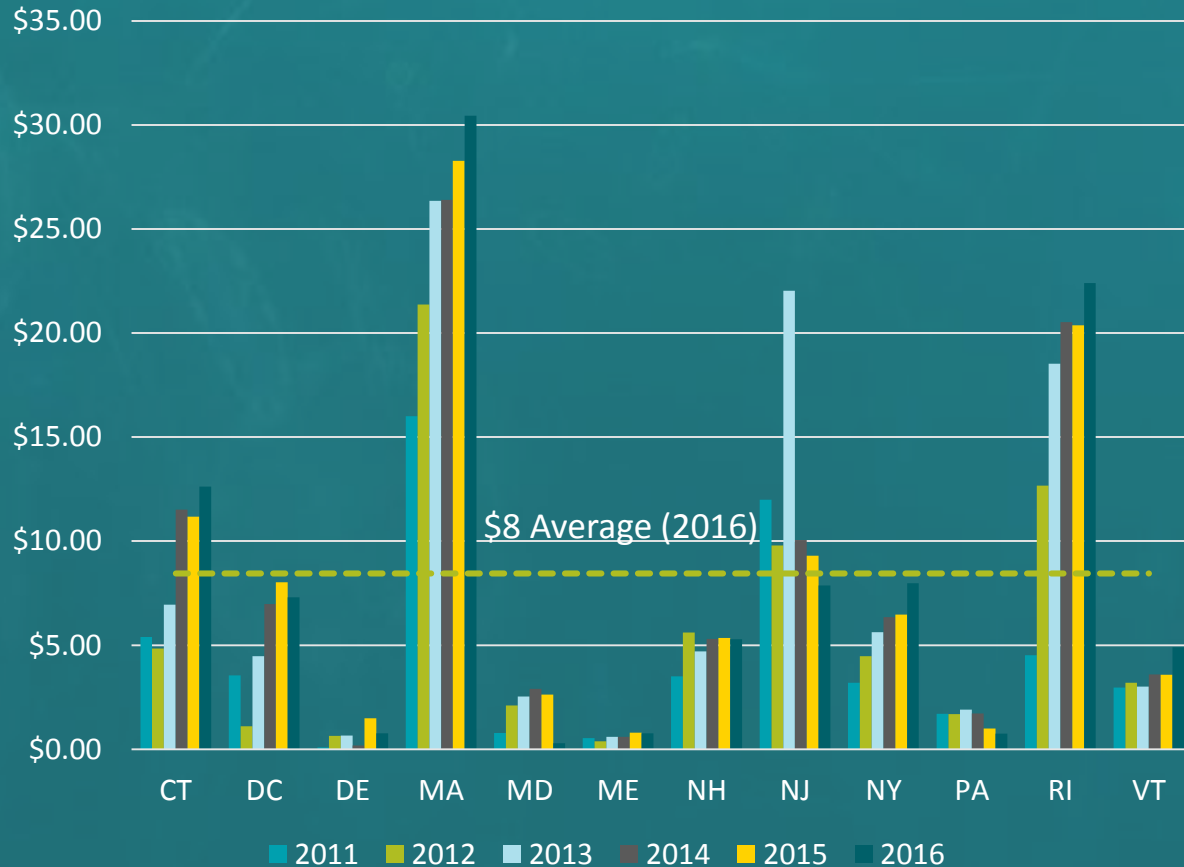


Source: NEEP [REED Database](#). For further information, see the NEEP REED [footnotes](#) page.

Per Capita Investment

Natural Gas Programs, 2011-16

On a simple per capita basis, investments in gas efficiency programs in the region are generally less extensive than investments in electric efficiency, but this may have to do with several states in our region that lack a statewide gas distribution level infrastructure.

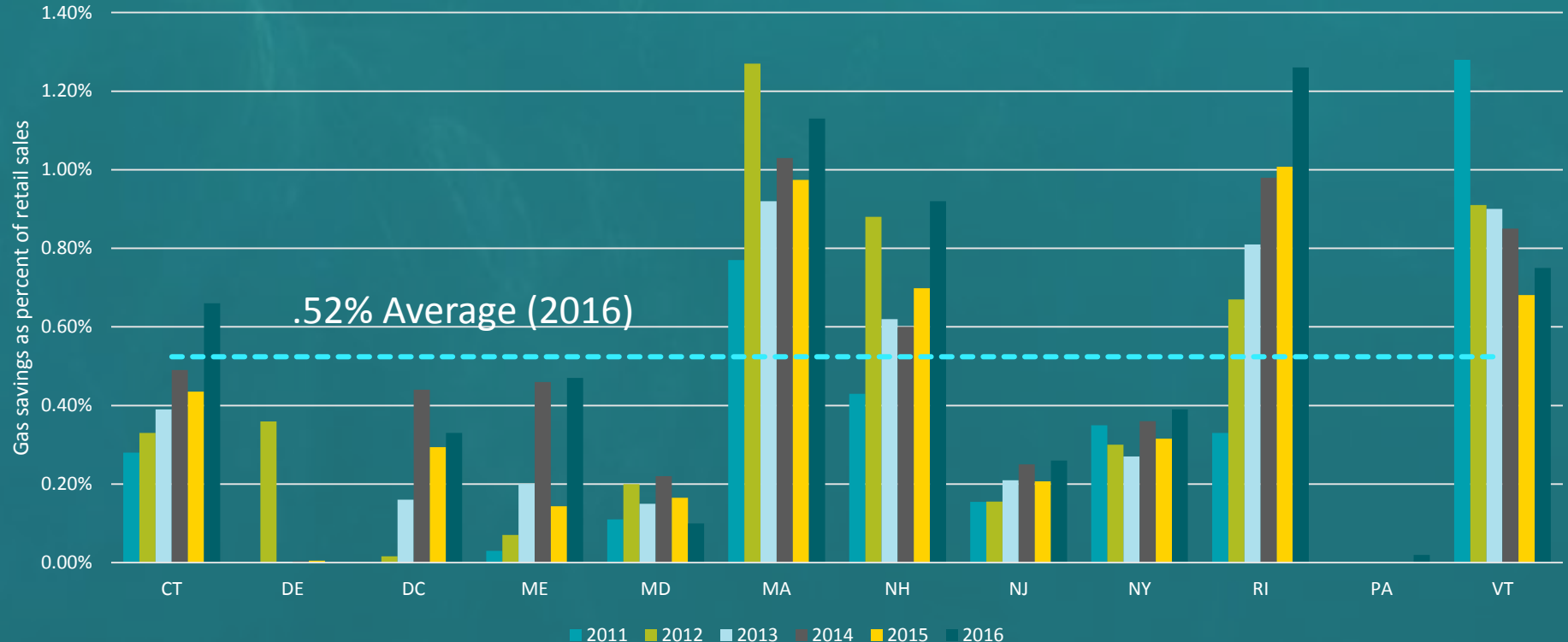


Source: 2011-16 data is drawn from NEEP's [REED Database](#) with the exception of NY, NJ, and PA, which are drawn from ACEEE's Scorecard. For further information on which program administrators are included in REED, please see the [REED Footnotes](#) website.

Savings as a Percent of Retail Sales

Natural Gas Programs, 2011-16

While natural gas programs are more modest than their electric counterparts, leading states aim to achieve savings of about one percent of retail sales, with the region saving on average ~0.52 percent of retail sales. Pennsylvania remains the *only* state in the region state doesn't claim savings from comprehensive gas efficiency programs.



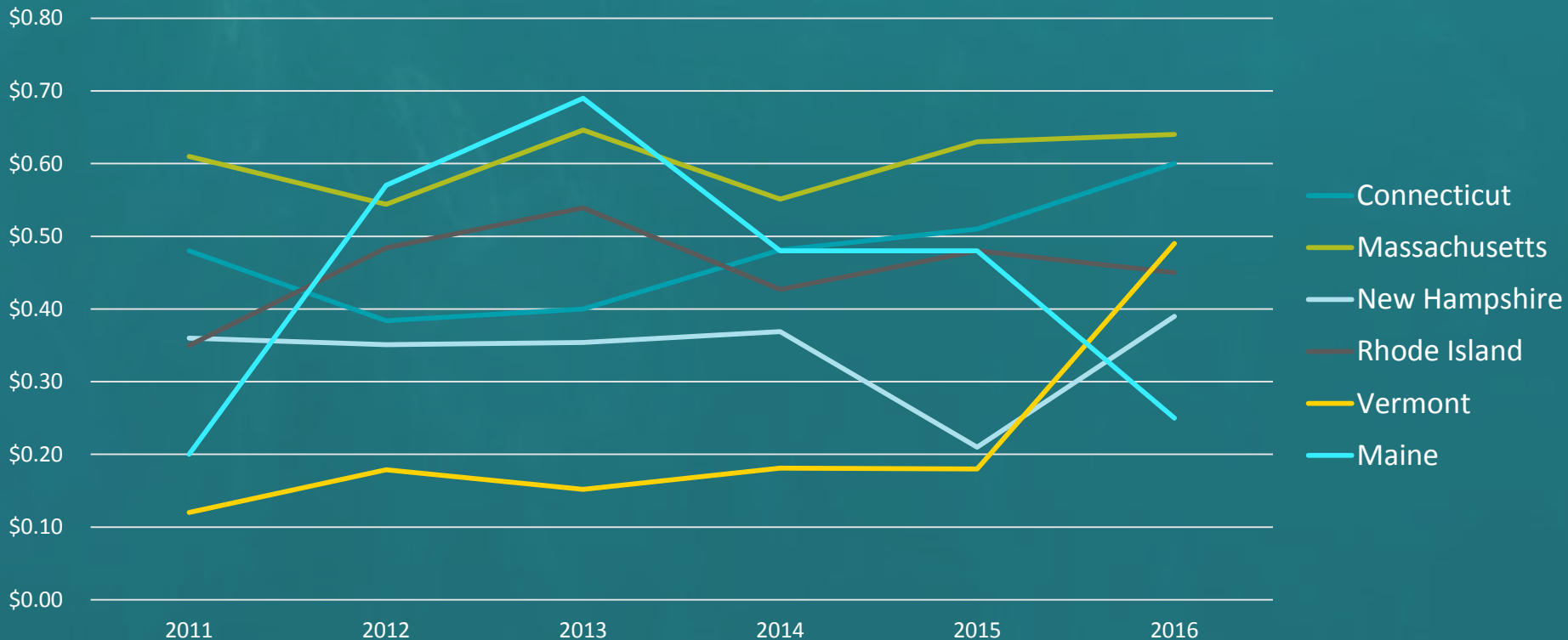
Source: 2011-16 data from NEEP's [REED Database](#) with the exception of NJ, and PA, which are drawn from ACEEE 's Scorecard. For further information on which program administrators are included in REED, please see the [REED Footnotes](#) website. *While Pennsylvania doesn't claim savings for programs 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



While conventional wisdom holds that the cost of saved energy should be rising as programs mature, program administrators in Massachusetts and Rhode Island have been able to push the levelized cost of energy per therm downward. The downward trend from 2013 to 2014 may correlate with a recent expansion in program scale. 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 [REED Database](#). For further information, see the NEEP REED [footnotes](#) page.

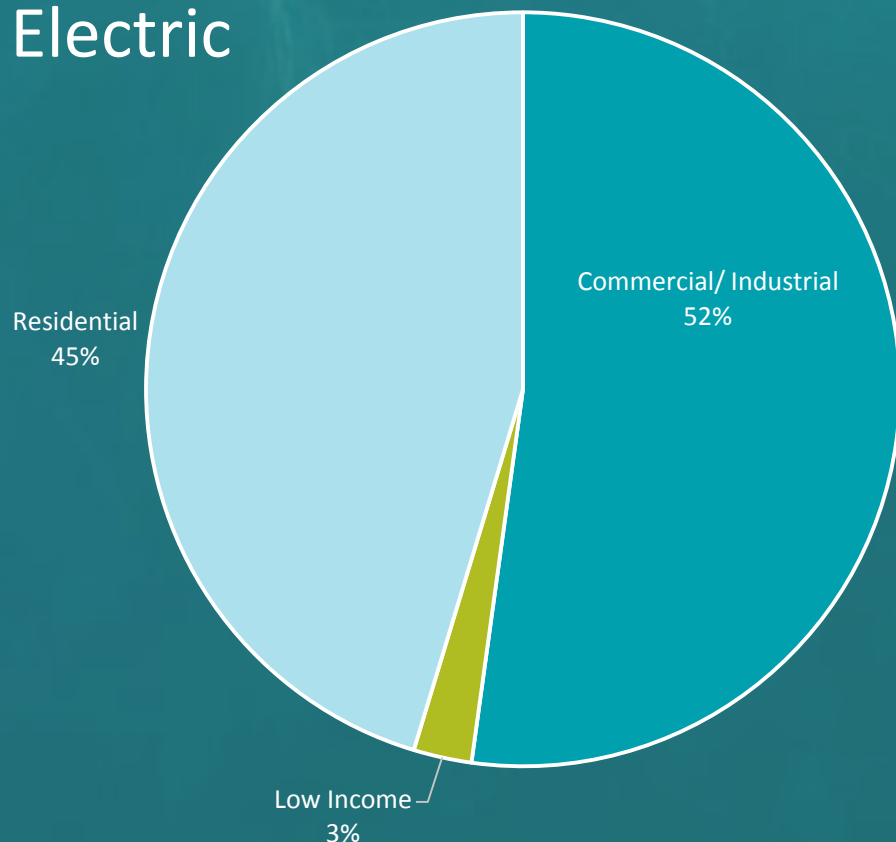
Energy Savings by Sector

Natural Gas and Electric, 2016

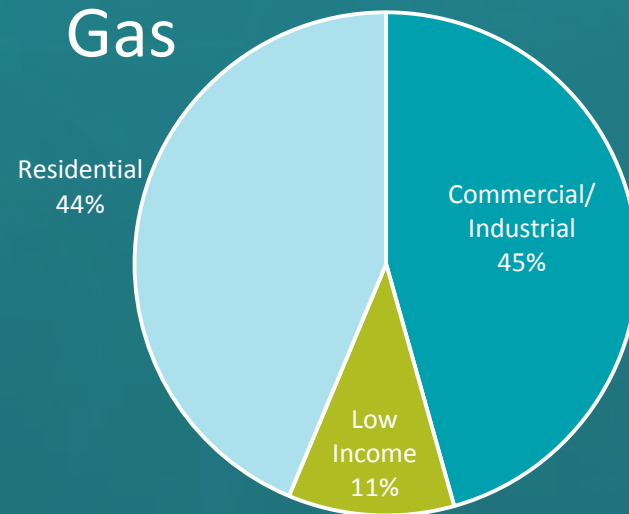


In the states reporting to REED, electric programs budgets are about four times as big as for natural gas, with more mature programs doing more with gas. Electric programs derive the majority of their savings from the commercial sector, while for gas programs, residential programs deliver the most savings.

Electric



Gas



REED States 2016 Expenditures

Electric	\$1.5 Billion
Gas	\$310 Million

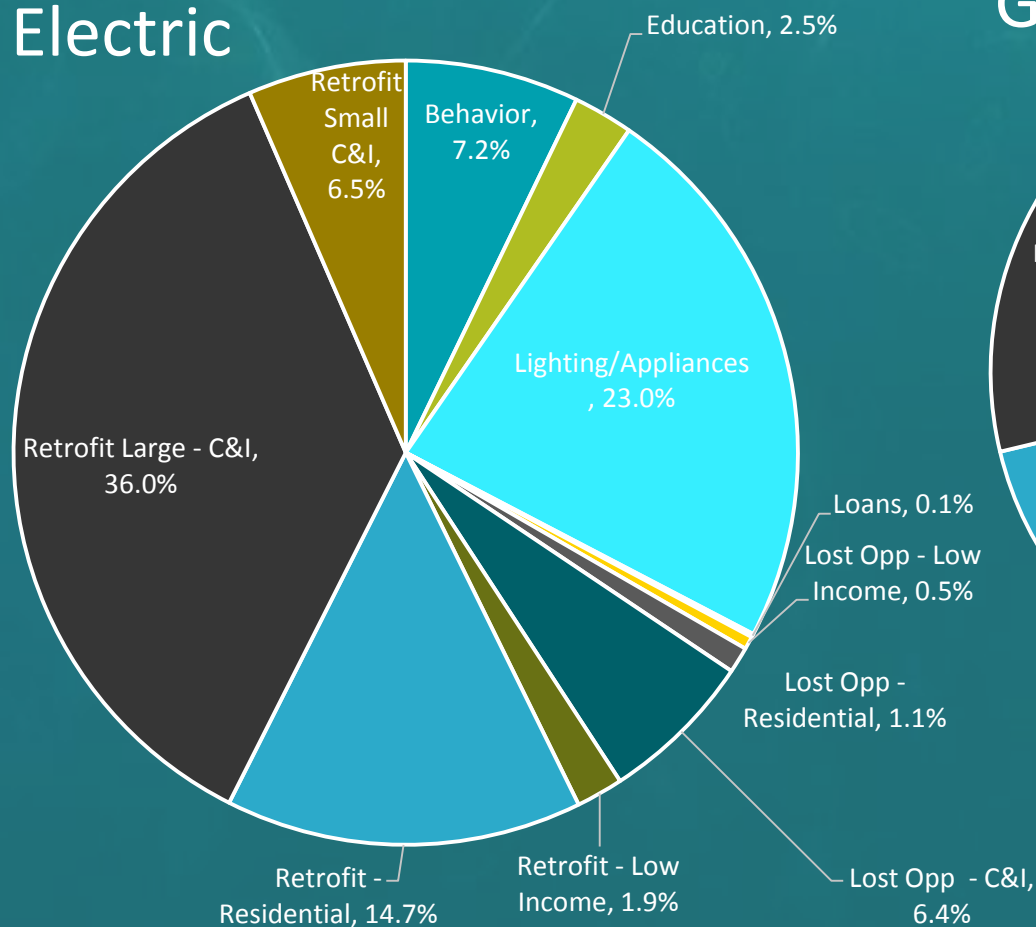
Savings by Program Type

Natural Gas and Electric, 2016

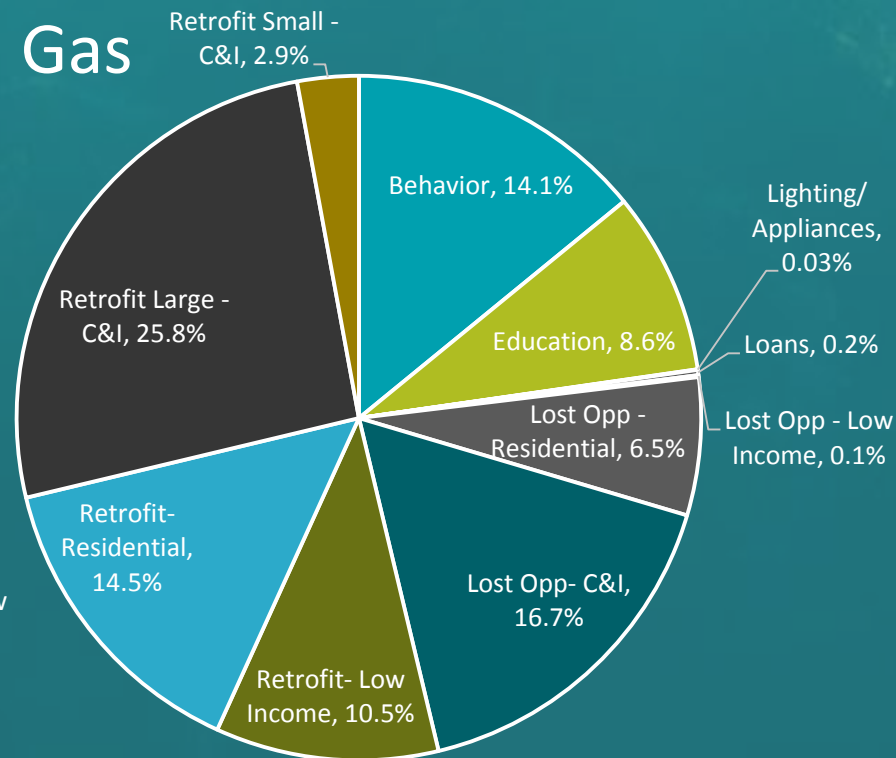


Electric programs mine the majority of their savings from lighting, appliances, and large commercial and industrial retrofits, while natural gas programs focus greater attention on low income and residential retrofit programs.

Electric



Gas



Source: NEEP REED Database, which includes Conn., D.C., Del., Mass., Md., N.H., N.Y., R.I. and Vt. **17**

State Carbon Reduction Goals

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



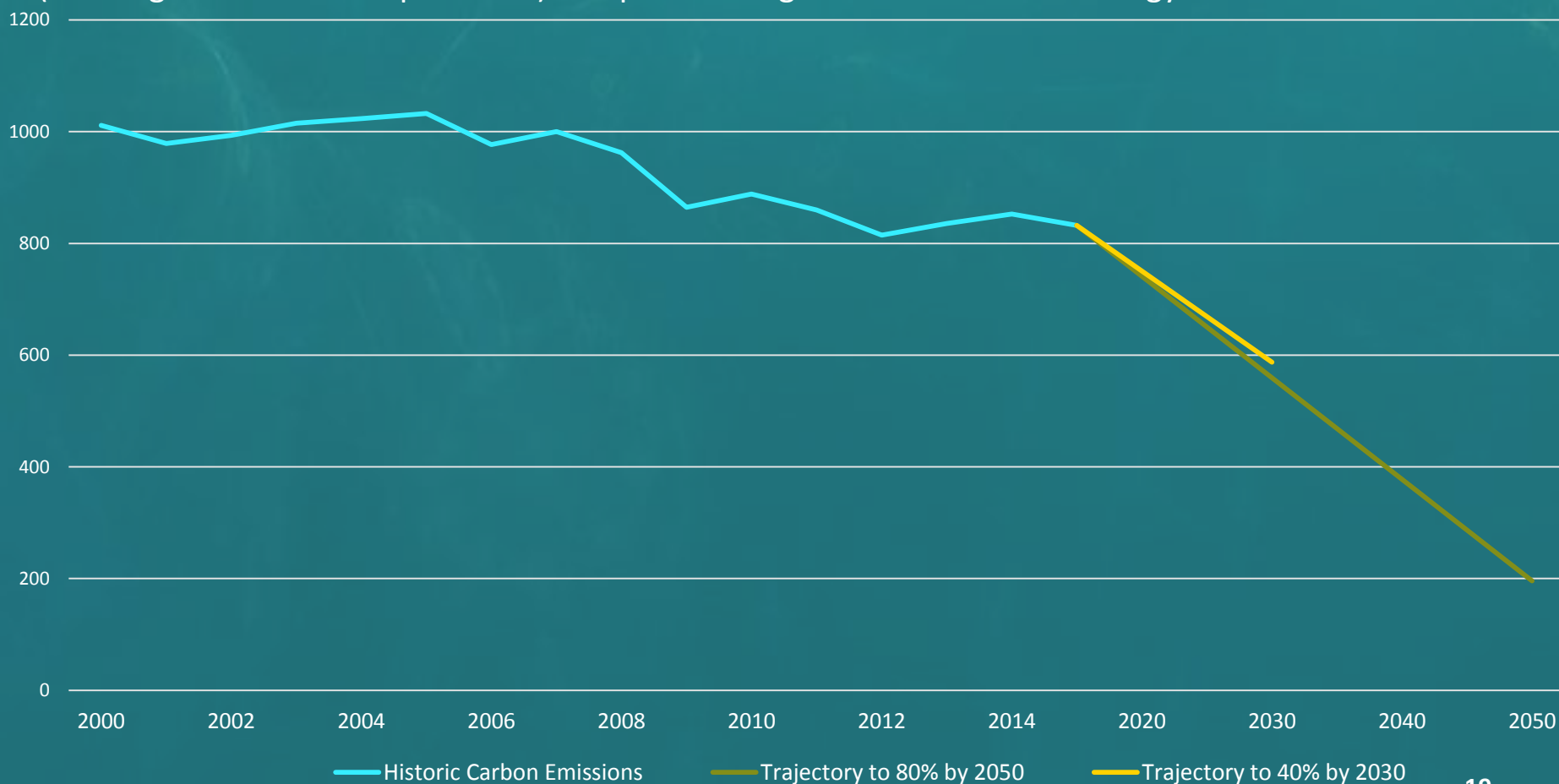
State	Near-term Goal	Interim Goal	Long-term Goal
Connecticut	10% by 2020	45% by 2030	80% by 2050
Delaware	30% by 2030		
Maine	10% by 2020		80% by 2050
Maryland	25% by 2020	40% by 2030	
Massachusetts	25% by 2020		80% by 2050
New Hampshire	10% by 2020	20% by 2035	80% by 2050
New Jersey	Stabilize by 2020		80% by 2050
New York	40% by 2030		80% 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.

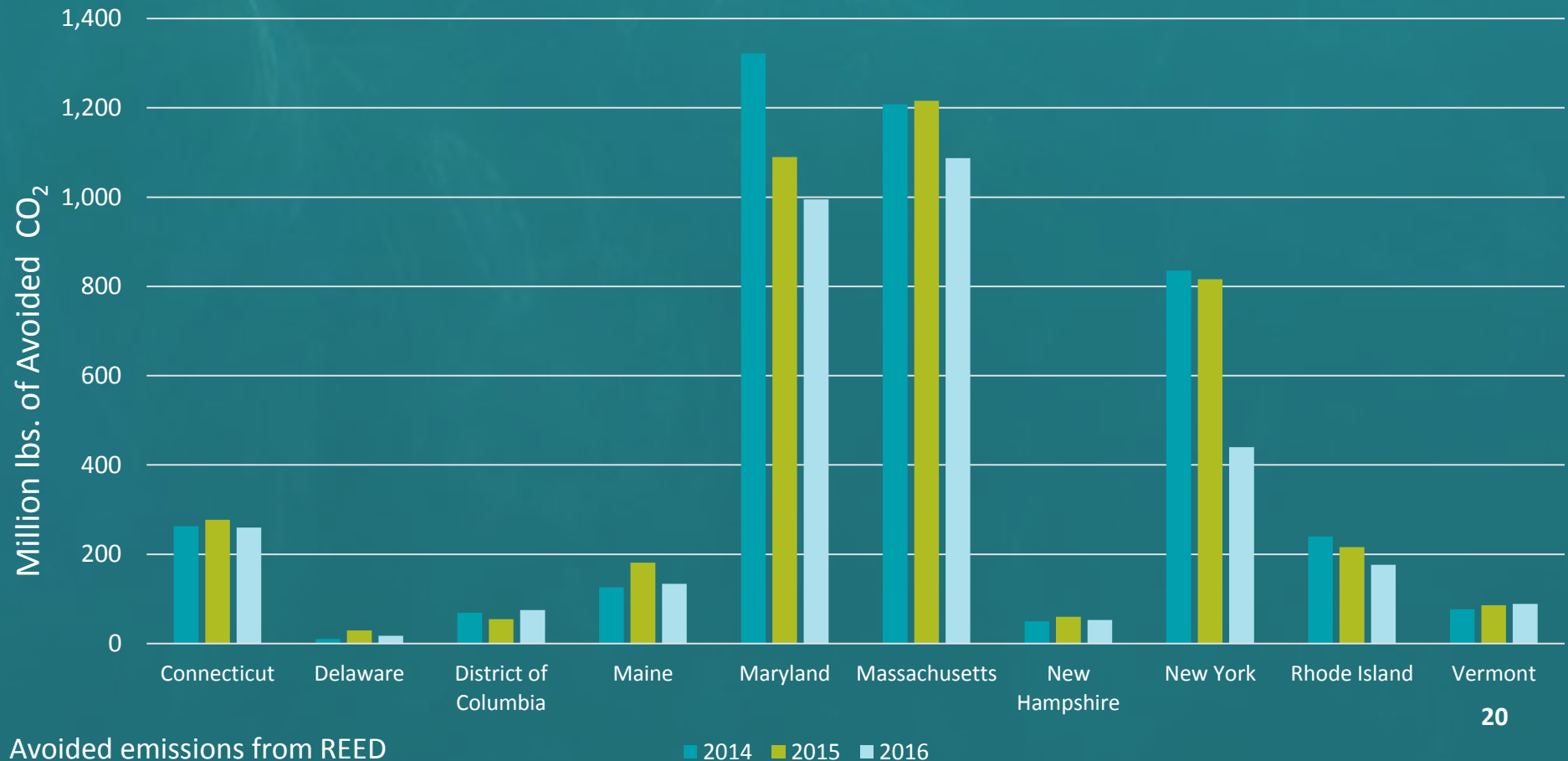


Source: Historic carbon emissions data from EIA, trajectory calculated based on region carbon levels in

Energy Efficiency Leads to Avoided Carbon



The region avoided over **three billion pounds of carbon emissions** in 2016 from the buildings sector. According to the EPA's Greenhouse Gas Equivalency Calculator, this is equivalent to carbon emissions from 3,492,913 barrels of consumed oil or 323,058 passenger vehicles driven for one year.



Identifying Trends in Regional Data

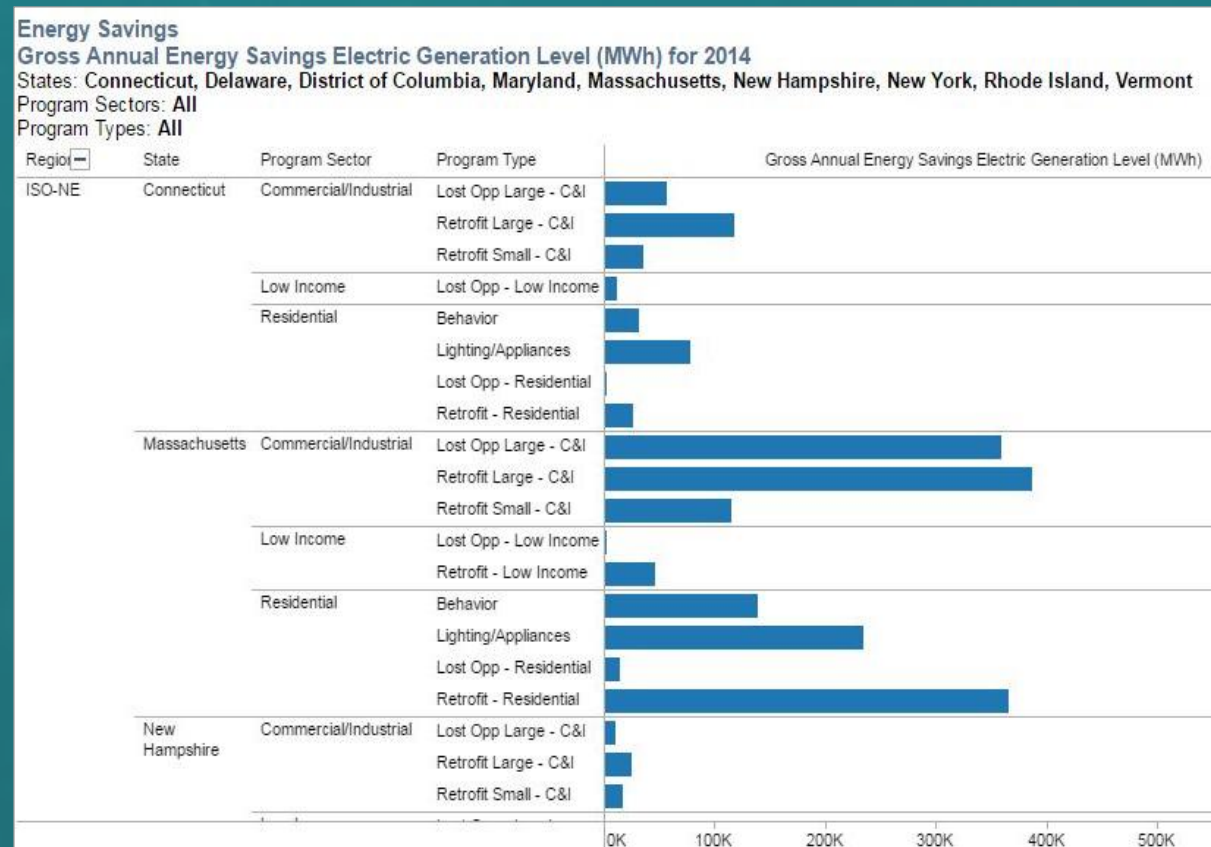
The Regional Energy Efficiency Database (REED)



Data collected by NEEP includes program years 2011 through 2016 for these participating jurisdictions: CT, DC, DE, MA, MD, NH, NY, RI and VT.

REED features:

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



More from NEEP

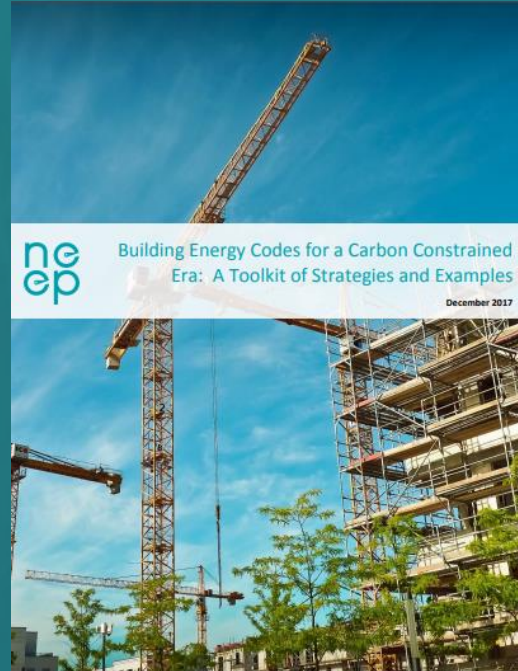
A Sample of reports at NEEP.org/Resources



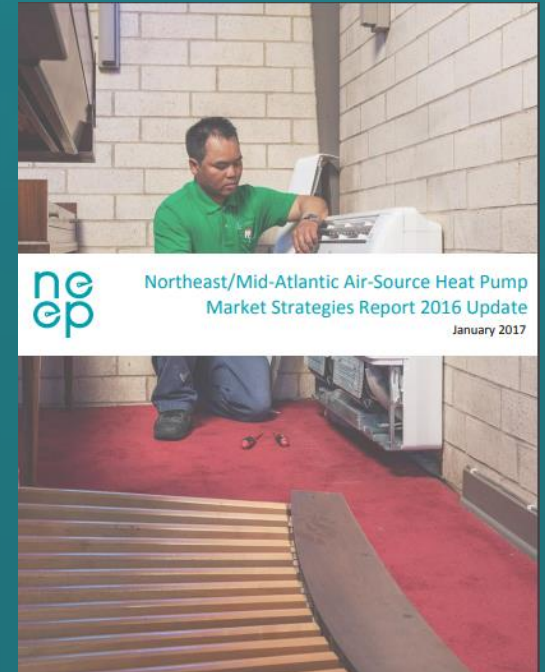
Action Plan to Accelerate Strategic Electrification in the Northeast



Building Energy Codes for a Carbon Constrained Era: A Toolkit of Strategies and Examples



Northeast/Mid-Atlantic Air-Source Heat Pump Market Strategies Report 2016 Update



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

Questions?



For more information on state policies or REED:

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