

All Cost Effective Energy Efficiency

Policy Summary: The Massachusetts Green Communities Act requires that electric and gas utilities pursue all cost-effective energy efficiency, i.e. eliminating energy waste whenever it is cheaper to do so than to buy additional supply. Since 2010, the utility program administrators (PAs), on behalf of the Commonwealth, have invested more than \$8.1 billion, with an anticipated return of over \$22 billion in benefits for electric and gas ratepayers. The PA-delivered programs, branded as “Mass Save®,” operate under the guidance of the Energy Efficiency Advisory Council (EEAC), which represents a broad range of stakeholders and is chaired by the Department of Energy Resources (DOER). Plans, budgets, and results are further reviewed and approved by the Department of Public Utilities (DPU).

	Savings from full policy implementation	% of 1990 level
Economy-wide GHG reductions in 2020	5.4 MMTCO ₂ e	5.8% ⁴⁷
Electric savings and GHG reductions in 2020	9,000 GWh ⁴⁸ , 4.45 MMTCO ₂ e	4.7%
Natural gas savings and GHG reductions in 2020	19.7 MMBTU, 0.8 MMTCO ₂ e	0.9%
Heating oil savings and GHG reductions in 2020	3.2 million MMBTU, 0.2 MMTCO ₂ e	0.2%
Cumulative net benefits 2010-2018	\$14.4 billion	

In support of this utility program requirement, the Commonwealth has adopted a suite of enabling policies and initiatives that increase participation and savings from the PA-implemented programs. Collectively this suite of energy efficiency policies has earned Massachusetts the number one state ranking for energy efficiency for the past five years.

Enabling state energy efficiency initiatives and cross-cutting policies:

Policy	Sector	Agency(ies)
<i>MEPA GHG Policy and Protocol</i>	Large commercial developments and power plants	EEA/DOER
<i>Leading By Example</i>	State-owned and leased properties and fleets	DOER/DCAMM
<i>Green Communities</i>	Municipal properties ⁴⁹ , fleets and stretch code	DOER/MassDEP

⁴⁷ The 5.4 MMTCO₂e and 5.8% is based on the new savings from the efficiency programs since 2009, due to the expansion to ‘all cost-effective’ criteria in the Green Communities Act. The program savings from efficiency spending prior to 2010 are excluded, since the emissions trend in the Business as Usual (BAU) projection is estimated to include them.

⁴⁸ Energy savings in 2020 are based on the full value of efficiency programs, including the spending levels that existed prior to 2010, in order to be consistent with DOER required reporting to DPU (this differs from the calculation of GHG savings, as discussed in prior footnote).

⁴⁹ Municipal properties include waste water treatment plants, schools and streetlights as well as municipally operated buildings such as town halls and libraries.

<i>Building Energy Rating and Labeling</i>	Existing homes and commercial offices	DOER
Combined heat and power	On-site generation	DOER
Zero Net Energy Buildings	New residential and commercial construction	DOER

Clean Energy Economy Impacts: From 2010 through 2018, the Mass Save program has committed to investments of \$8.1 billion in energy efficiency. As a result, energy efficiency accounts for the majority of the clean energy sector jobs in Massachusetts. In addition, the program commitments through 2018 are forecasted to generate \$14.4 billion in net benefits, largely in avoided future costs of energy and avoided energy infrastructure costs. These savings will largely stay in the local economy rather than flowing out of the Commonwealth, while reducing living costs for residents and operating costs for businesses.

Rationale: Investment in energy efficiency is generally more cost-effective than investing in building new power plants to serve growing electric service needs, or supplying more gas or oil heating fuel to buildings. However, due to various market barriers, including lack of upfront capital for energy efficiency upgrades and misaligned timing for investment and recouping savings, investments in energy efficiency fall short of optimal, both for an individual organization and for the Commonwealth as a whole.

GHG Impact: The combined electric and gas PA programs will reduce emissions by an estimated 5.4 MMTCO_{2e} in 2020. This 2015 estimate is updated to reflect the reality that electric energy efficiency measures are saving electricity from generation sources that are substantially less carbon intensive than was forecast in 2010. As a result, emissions savings per MWh are lower, while the level of investment in energy efficiency and savings as a percentage of total customer load are meeting plan goals.

Other Benefits: By reducing fossil fuel combustion, the Mass Save program helps to reduce the clearing wholesale market price for electricity and defer the need to invest in new generation, transmission, and local distribution networks. In addition, these programs are a significant source of in-state jobs, and the fuel savings reduce hazardous air pollutants—providing public health and environmental benefits.

Cost: From 2010 to 2018, the electricity, natural gas, and oil efficiency programs are estimated to generate \$22.5 billion of economic benefits at a cost of \$8.1 billion, yielding \$14.4 billion in net benefits for the Commonwealth largely in avoided future costs of energy and energy system expansion. As such, this program is an excellent investment, rather than a cost to the economy.

Next Steps: Innovation is continuing to transform the market for energy efficiency. Most notably in the lighting sector, Massachusetts has used upstream incentives to accelerate a shift to LED lighting coupled with digital controls, making the Commonwealth an international leader in deploying advanced lighting technology. The emerging “internet of things,” in conjunction with smart grid investments, provides future possibilities for energy efficiency and demand response to meet our electric and heating demands more cost-effectively than from new generation.