

MA19R16-B-EO: Energy Optimization Measures and Assumptions Update

Type of Study: Market Characterization or Assessment Evaluation

Evaluation Conducted by: Guidehouse

Date Evaluation Completed: 3/2/2020

Study Objective and Summary of Results:

This study updated the previously developed Energy Optimization Model (EOM) for residential energy optimization measures in Massachusetts. The evaluation team initially developed the EOM in October 2018 to estimate the costs and benefits associated with a variety of energy efficiency measures that use electric heat pumps and natural gas heating equipment to displace the consumption of delivered fuels. The PAs have used this model to develop prescribed savings values used for energy efficiency measures that involve fuel switching.

The study included updates to the model, including revised input values, new installation parameters, and new measures covering ground-source heat pumps (GSHPs). In addition, the study implemented further improvements in the model as part of the C&I Energy Optimization Study (MA19C04-E-EO) conducted for the Massachusetts commercial PAs.

Core Initiatives or End Uses to which the Results of the Study Apply:

- Residential
- Residential Coordinated Delivery
- HVAC & Hot Water
- Electric & Gas
- The PAs have used this model to develop prescribed savings values used for energy efficiency measures that involve fuel switching.

Evaluation Recommendations:

No formal recommendations were made in this evaluation.

Explain Whether or Not the PAs Decided to Adopt the Recommendations from the Study:

N/A (no formal recommendations were made in this evaluation)

How the Study Affects Program Results and Its Significance:

The findings of this study help inform an update of the Residential Coordinated Delivery rebate offerings. The study provides information that will help PAs make informed

decisions about the replacement scenarios for which rebates are offered, and the rebate amounts that are offered. This study updated a spreadsheet tool that PAs may use to evaluate the costs and savings available from different user-input operating assumptions, including different equipment capacities, balance points, and cooling and heating loads.

Overview of Study Method:

The goal of this study was to update the existing EOM with more recent data sources and to implement additional features of interest to the PAs and EEAC consultants. The original EOM was developed in 2018 and allowed users to estimate the savings, costs, peak demand, and lifetimes for a focused group of energy optimization measures for space heating and water heating end uses.

The evaluation team used the following publicly available data sources throughout the analyses conducted for the EOM update:

- Massachusetts Technical Reference Manual (TRM), 2019-2021 Plan Version
- Residential Evaluation Studies Conducted on Behalf of the EEAC
- Northeast Energy Efficiency Partnerships (NEEP) Cold Climate Air-Source Heat Pump
- ISO-NE Electricity Generation Fuel Mix
- Massachusetts Clean Energy Center (MassCEC) GSHP Rebate Data

Application of Results: Prospectively

A copy of the complete study can be found in **Appendix D, Study XX.**