

Executive Summary

RI-24-RX-IncEligible

Rhode Island (RI) Energy offers IESF to help income-eligible single-family customers in the state improve the efficiency of their homes. In 2021-2023, IESF completed more than 11,000 home energy assessments and installed more than 150,000 energy efficiency measures at no cost to participating customers. Collectively, these measures generated ~58,000 MMBTUs in annual gross ex ante energy savings. Collectively, weatherization and heating system retrofits represented 86% of IESF savings. Natural gas measures accounted for more than half of IESF savings (56%) followed by heating oil (27%), electricity (17%), and propane (<1%).

Why Evaluation?

RI Energy uses evaluation to assess the performance of its programs and estimate the likely savings associated with future program years. In May 2024, RI Energy contracted with Cadeo, a third-party energy efficiency program evaluation company, to evaluate IESF measures installed 2021, 2022, and 2023. Cadeo independently evaluated the savings associated with each IESF measure using a combination of billing analysis, calibrated building simulation, and engineering algorithms.

Key Results

● Previous Evaluation savings ● Evaluated Savings ● Direction of Change



Weatherization therms/year

124

93



Relative to the previous evaluation, this evaluation found a 25% decline in average natural gas savings for weatherized IESF participants (93 vs. 124 therms/year). Program data indicates participants in the current evaluation were less comprehensively weatherized than those in the previous evaluation. Specifically, fewer 2021-2022 participants received both air sealing and insulation (68%) than 2015-2016 participants (81%). The evaluation also found more recent participants used less natural gas to heat their home prior to IESF, which means is less energy to save via weatherization.



Heating Systems (Boiler) MMBTUs/year

16

12



This evaluation also found lower average savings (16 vs. 12.1 MMBTUs/year, 24% decline) for high efficiency natural gas boilers installed through IESF. Conversely, the evaluation found somewhat higher savings (14% increase) for heating oil and propane boilers compared to the previous evaluation. While true, the average savings for heating oil/propane boilers (8.9 MMBTUs/year) is still less than natural gas units. The primary reason for the lower delivered fuels savings compared to natural gas is because the baseline efficiency of delivered fuel units is higher than natural gas' (77% vs. 75%) while replacement HVAC efficiencies are higher for natural gas units than delivered fuel units (89% vs. 87%).

Recommendations:

Establish reliable baseline HVAC efficiency values. IESF should replace the current default baseline efficiency assumptions with field-tested fuel-specific values when possible (or empirically based secondary source).

Collect characteristics of replaced appliances. IESF should collect age, size, and configuration data for every replaced appliance to inform future evaluation efforts.

Track pre- and post weatherization building envelope characteristics. IESF should record pre- and post-measure R-values for insulation surfaces and conduct blower door tests to find the pre- and post-air sealing air infiltration rates to inform future program planning and evaluation.

More granular weatherization categorization. IESF should establish explicit and standardized sub-weatherization measure categories at a specificity between current measure description and impact groups.