

Estimation of Energy Savings from the NJ Weatherization Assistance Program

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Introduction

Rutgers Center for Green Building (RCGB) was tasked with developing the savings estimates for the New Jersey Weatherization Assistance Program (WAP) in order for the Board of Public Utilities (BPU) and Statewide Evaluator (SWE) to determine how these savings, and additionally savings from energy codes and A5160, will impact the overall energy savings goals that the utilities and State must achieve. The WAP currently uses a savings estimate of 30.5 BTUs per weatherized units, but BPU and SWE wished to have an estimate for both electricity and natural gas. In the future, RCGB hopes to be able to develop a more exact estimate of energy savings using pre- and post- billing data that the Department of Community Affairs has collected from the participants. This analysis will be updated if that data is made available.

The results of the analysis show that the WAP will account for a small amount of energy savings towards the total goal for FY25-FY27 (Triennium 2): about 1.5% of the goal for electricity and about 7%-8% of the goal for natural gas.

Methodology

RCGB used a combination of New Jersey WAP data and historical study results to determine the savings estimate that may be attributed to the program during Triennium 2 (FY25-27). In order to calculate the estimate, RCGB used estimates of number of units weatherized, the breakdown of units per housing type, and energy savings per housing type.

Number of Units Weatherized

RCGB used the WAP annual savings plan report to find units weatherized. The 2023 State Plan indicated that 550 units would be weatherized,¹ Furthermore, NJ received additional funding from the 2022 Bipartisan Infrastructure Law, which would result in an estimated 6,516 weatherized units over a 5 year period (2023-2027)². In total, RCGB is assuming 1853 units will be weatherized each year from 2025 to 2027 (550 units from FY23 plan+ 1303 additional units per year using BIL funds).

Housing Units By Type

DCA provided RCGB the breakdown of weatherized units from 2018 to 2022. RCGB averaged the data over 5 years and the resulting breakdown is in Table 1 below.

¹ New Jersey Department of Community Affairs, "2023 New Jersey State Plan and Grant Application for U.S. Department of Energy's Weatherization Assistance Program."

² New Jersey Department of Community Affairs, "2022 New Jersey State Plan and Grant Application for U.S. Department of Energy's Bipartisan Infrastructure Law (BIL) Grant."

Table 1: Weatherized Units by Housing Unit Type

Unit Type	% of Total Units
Single Family Home	63%
Mobile Home	13%
Large Multifamily	14%
Small Multifamily	7%
Other	3%

Source: NJ DCA Data

By comparison, a 2014 national weatherization program study by Oak Ridge National Laboratory (ORNL) showed the breakdown by weatherized units was 59% single family site built, 18% mobile home, 5% small multifamily, and 18% large multifamily.³

Energy Savings Per Housing Type

To estimate the energy savings per weatherized unit, RCGB used data from the National Weatherization Assistance Program study by ORNL.⁴ The estimated savings are shown in Table 2 below.

Table 2: Estimated Savings per Unit Type

Unit Type	kWh Savings	Therm savings
Single Family Home	1799	182
Mobile Home	441	107
Large Multifamily	275	76
Small Multifamily	412	161

Source: ORNL 2014

Calculation of Savings Attributable to the Weatherization Assistance Program

Using the data described above, RCGB calculated the energy savings by unit type in both kWh and therms. A sample calculation is shown in Figure 1.

Figure 1: Sample Calculation for Single Family Home WAP Savings Estimate

Example Calculation for SF Homes:

1853 units * 63% * 1799 kWh = 2,100,134 kWh

1853 units * 63% * 182 Therms = 212,465 Therms

kWh and Therm savings estimates were from ORNL 2014

³ Tonn, Bruce Edward, Carroll, David, Pigg, Scott, Blasnik, Michael, Dalhoff, Greg, Berger, Jacqueline, Rose, Erin M, Hawkins, Beth A., Eisenberg, Joel Fred, Ucar, Ferit, Bensch, Ingo, & Cowan, Claire. *Weatherization Works--Summary of Findings from the Retrospective Evaluation of the U.S. DOE's Weatherization Assistance Program*. United States.

⁴ Ibid.

Results and Comparison to Goal Setting Study Results

Tables 3 and 4 show the MWh and DTh savings, respectively by Unit Type and Total for each year in Triennium 2 (FY25-27). Overall, it is expected that the WAP will save 2,334 MWh per year and 27,963 DTh per year.

Table 3: MWh Savings by Unit Type

Unit Type	FY25 (MWh)	FY26 (MWh)	FY27 (MWh)
Single Family	2,100	2,100	2,100
Mobile	110	110	110
Large MF	71	71	71
Small MF	53	53	53
TOTAL	2,334	2,334	2,334

Table 4: DTh Savings by Unit Type

Unit Type	FY25 (DTh)	FY26 (DTh)	FY27 (DTh)
Single Family	21,246	21,246	21,246
Mobile	2,657	2,657	2,657
Large MF	1,972	1,972	1,972
Small MF	2,088	2,088	2,088
TOTAL	27,963	27,963	27,963

RCGB also compared the programs attributable to the WAP to the savings goals from the Cadmus Goal Setting study. Table 5 shows that the WAP electricity savings would account for about 1.5% of the total electricity savings goal.

Table 5: WAP Electricity Savings vs Statewide Goals⁵

	GWh Sales	Statewide Reduction Goal (GWh)	WAP Savings (GWh)	% WAP Sales of Total Goal
FY25	74,963	134.4	2.334	1.7%
FY26	74,599	172.4	2.334	1.4%
FY27	75,435	173.5	2.334	1.4%

Table 6 shows that the WAP natural gas savings would account for about 7%-8% of the total natural gas savings goal.

	DTh Sales	Statewide Reduction Goal (DTh)	WAP Savings (DTh)	% WAP Sales of Total Goal
FY25	458,474,852	351,914	27,963	7.9%
FY26	463,240,355	394,000	27,963	7.1%
FY27	468,059,140	393,674	27,963	7.1%

⁵ State energy forecasts from Goal Set Scenario 1-2-3 Outputs 3.22.23_Cadmus Tables_WG, Tab "Base NJ 2023 Net Targets" cells H23 to H25 for electricity and H89 to H91 for natural gas. NJCEP reduction goal from NJ BPU Report - Executive Summary_20230412, "Table 1. New Jersey Full Compliance Scenario Targets."