**Shell Measures**

**Request Summary:** Provide furnace fan savings estimates for weatherization measures (5.6.1 – 5.6.4)

**Evaluator Comments:** The evaluation team agrees with the methodology used to estimate furnace fan savings. However, we believe that the algorithms used for the insulation measures overestimate savings, and that savings estimates for these measures should be calculated using energy simulations or billing analysis for improved accuracy. This is evidenced by the Massachusetts 2011 Low Income Program Evaluation,[[1]](#footnote-1) which used a combination of billing analysis and calibrated simulation models (built using actual participant audit data) to determine savings from weatherization measures. The evaluation team compared the Massachusetts results to calculated savings using the Massachusetts audit data inputs and the TRM algorithms. As shown in Table 1, the TRM algorithm overestimates savings significantly, especially for the wall and basement sidewall insulation measures. The evaluation team did not include the floor insulation over crawlspace TRM measure because the Massachusetts equivalent measure was not limited to floors over crawlspace. However, these savings may be too high as well since they use the same methodology. While an engineering algorithm approach that allows flexible inputs is convenient for TRM users, it is not as accurate as calibrated simulation or billing analysis which are the industry standard for estimating savings from these measures.

Table : Comparison of Evaluated Results and TRM Calculations for MA Low Income Program

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Measure | MA Participant Audit Data[[2]](#footnote-2) | MA Participants w/Valid Data | TRM Algorithm Therm Savings | MA Evaluated Therm Savings | Percent Difference |
| Basement Sidewall Insulation | 287 ft2  Rpre = 6.6  Rpost = 23.6 | 3 | 44 | 13 | 236% |
| Wall Insulation | 1,243 ft2  Rpre = 3.4  Rpost = 13.0 | 210 | 346 | 115 | 200% |
| Attic Insulation | 944 ft2  Rpre = 8.2  Rpost = 27.0 | 248 | 112 | 83 | 35% |

1. Ibid. See Tables 16 (p. 29) and 19 (p. 30) [↑](#footnote-ref-1)
2. Also used MA LI program average system efficiency of 77% and MA-specific base 60 HDD of 4834. [↑](#footnote-ref-2)