

## Energy Savings Adjustment Process

As part of the independent validation of annual energy savings achieved by a provider’s Energy Optimization (EO) program, adjustments may be made to the energy savings reported by each provider. This document recommends a general process and the frequency through which EO program providers will make these adjustments, and provides a framework as to how the results will be applied and reported.

There are four general steps in conducting an impact evaluation of demand-side management programs as listed in Table 1 below. This document addresses three of the four steps, with the exception of Step 3, “Perform Measurement and Verification”, which is a process concurrently being developed with support from the evaluation and implementation work groups. The measurement and verification step will be outlined in a separate paper. The three steps addressed in this document include:

- **Audit EO reported savings:** This step requires the validation of each EO provider’s program energy savings by the provider’s third party evaluator.
- **Verify Installation:** This step confirms measures have been installed and are still operating.
- **Determine net savings:** Identifies savings directly attributable to a program.

**Table 1. DSM Energy Saving Adjustment Overview**

<b>Adjustment Step</b>	<b>Frequency</b>	<b>When Results are Applied</b>	<b>Where Results are Applied</b>
Step 1: Audit EO Reported Savings	Yearly	Applied to program year reported savings	Annual Reconciliation Report
Step 2: Verify Installation	Yearly	Applied to program year reported savings	Annual Reconciliation Report
Step 3: Perform M&V	Yearly or as needed	Applied to next year reported savings	As part of the MEMD update process
Step 4: Determine Net Savings	At least once Every three years	Applied to next year reported savings	Annual Reconciliation Report (when applicable)

Specific details regarding each of the three steps and how adjustments should be made at the measure and program level are outlined in the following sections.

### **Annual Audit of EO Program Savings**

As part of the annual reconciliation process, each EO provider will have an independent evaluation contractor perform an audit of their program portfolio’s energy savings. This step helps ensure providers are reporting accurate information. This audit should be performed yearly for each program in an EO provider’s portfolio and the results will be applied to the EO providers reported savings. The annual audit of EO Program steps include:

1. Review of EO provider and implementation contractor tracking databases to ensure an accurate transfer of participant data.

- a. Verify that the number of reported participants and measures are the same between the implementation contractor and EO provider databases.
  - b. Verify that claimed savings (gas/electric) match the customer type (gas/electric) and customers' equipment types (e.g. must have a gas water heater to get gas savings from a low flow showerhead).
2. Review of program applications, installation tally sheets, and/or invoices.
    - a. Selection of a representative sample of actual application, tally sheet or invoice documents from EO provider. The sampling for each program will achieve a criterion of 90% confidence and 10% precision and may be stratified by measure type—which generally corresponds to end-use for most programs.
    - b. Confirm that participants are actually customers of the EO provider for the fuel type where savings are being reported.
    - c. Verify that measure type and quantity reported are the same as identified in an EO provider's tracking system.
3. Review of energy savings values in EO provider's tracking system to ensure it matches the value contained in the MEMD. This review does not result in altering deemed savings values in the MEMD; It only ensures that those values are being used properly.
    - a. Confirm proper MEMD value for non-weather sensitive measures are being used in an EO provider's tracking system.
    - b. Confirm the proper use of the MEMD weather sensitive weighting tool.
    - c. When a prescriptive measure savings value is calculated by an implementation contractor because that measure is not in the MEMD, the calculation used to derive the reported value will be reviewed via a statistically representative sample of projects.

### **Installation Verification**

This part of the adjustment process typically involves collecting primary data from participants to verify reported measures are still installed and operating properly. This adjustment step uses a random sample of installations selected for analysis. Typical methods for collecting necessary data include the following:

- Telephone surveys (self reported confirmation from the participant)
- Site Visits (third-party evaluation team physically verifies and confirms equipment is installed and operating properly)

This step addresses issues such as:

- Incented measures that have never been installed;
- Measures installed outside an EO provider's service territory;
- Measures that were installed but later removed;
- Measures that were improperly installed; and
- Measures that don't match those identified in EO provider's tracking systems.

This document does not recommend specific data collection requirements for installation verification. Instead, each EO provider will rely on the methodology selected from their third-party evaluator. When

applicable or needed, evaluators may be asked to present their methodology to the evaluation working group.

Each EO program (i.e. HVAC, Income qualified, small business direct install) represents its own unique program design and evaluation challenges. Therefore, even though programs may share the same measure (i.e. compact fluorescent lamps), different evaluation methodologies may be required to verify measure installation.

Given that not all measures in a program are installed equally or contribute equally to total program savings, sampling for each program may be stratified to place more emphasis on more prevalent or higher savings measures. Measures in a program that constitute a small percentage of that programs total savings value may be excluded from the verification sample to allow evaluation budgets to focus on the measures most important to programs' success. Installation rates for these measures will be derived from the provider's evaluation contractor's experience and secondary literature research. In some instances, these measures may be assumed to have a 100 percent installation rate.

Frequency of installation verification should be performed annually for each EO program reporting savings. Installation verification is not required for pilot programs, programs in their first two years of launch or programs that address behavioral change.

#### **Determine Net Savings**

Net adjustments are adjustments that identify the proportion of gross savings attributable to EO programs. These adjustments typically involve assessing free ridership, the proportion of energy savings that would have been achieved in absence of the program, and spillover, additional energy savings influenced by program participation but not specifically supported or incited by a program.

Alternate methods can be used to collect data and calculate net adjustments depending on program design and the measure of interest. As such this document does not recommend specific data collection or analytical requirements. All net adjustment estimates should be determined by an EO provider's independent evaluation contractor(s).

Given that not all measures in a program are installed equally or contribute equally to total program savings, sampling for each program may be stratified to place more emphasis on more prevalent or higher savings value measures. Measures in a program that constitute a small percentage of that programs total savings value may be excluded from the net savings analysis.

Frequency of determining net savings should be performed no less than every three years for each EO program reporting savings, unless there are significant changes in the marketplace. Determining net adjustments is not required for pilot programs, programs in their first two years of launch, programs addressing behavioral changes, programs that cover 100 percent of the purchase and installation costs, and income qualified programs.

#### **Adjustment Calculation**

Each EO provider will be responsible for applying the relevant energy savings adjustments in their annual reconciliations beginning with calendar year 2011. For most programs, the basic formula for calculating adjustments at the measure level is outlined in Table 2.

**Table 2. Adjustment Calculation**

Adjustment Steps		Step 1: Audit Savings		MEMD Per Unit Savings Value	Step 2: Verify Installation		Step 4: Determine Net Savings		
Program	Measure	Reported Qty	Verified Qty		Installation Rate	Total Adj Gross	Freerider/ Spillover %	Net -To - Gross Ratio	Net Savings
Program A	Measure 1	10	10	100	95%	950	10%	0.9	855

The following provides details regarding each column in Table 2 starting with step 1: Audited Savings.

- **Reported Quantity:** The reported quantity represents the total number of reported measures being claimed by the EO provider.
- **Verified Quantity:** The verified quantity represents the total number of measures validated by the provider’s evaluation contractor.
- **MEMD per Unit Savings Value:** This is the approved weather or non-weather energy savings value for that particular measure.
- **Installation Rate:** Is the percent of measures found to be installed and operating during the evaluations verification process.
- **Total Adjusted Gross:** Is the verified quantity multiplied by the MEMD per unit savings value and then multiplied by the installation rate.
- **Free rider percent:** The percent of participants that would have purchased the high efficiency equipment in the absence of the program.
- **Spillover:** Reductions in consumption caused by the presence of energy efficiency programs, but not specifically resulting from the installation of incented measures installed.
- **Net-to-Gross Ratio:** Is represented as (1-proportion of freeridership+spillover). It should be noted that for programs such as upstream lighting program, the net-to-gross ratio is the ratio of the programs effect to the actual number of incented lamps.
- **Net Savings:** The net energy impact is that percentage of gross energy impact attributable to the EO program activities. Multiplying this ratio by the total adjusted gross savings identifies the savings that can be claimed for a particular measure.

Results for each measure in a program are then rolled up to provide program level savings (Table 3). Annual reconciliations will only present program level savings. Specific detail on a measure by measure basis will be documented in program evaluation reports.

**Table 3. Program Level Savings Example**

Adjustment Steps		Step 1: Audit Savings		MEMD Per Unit Savings Value	Step 2: Verify Installation		Step 4: Determine Net Savings		
Program	Measure	Reported Qty	Verified Qty		Installation Rate	Total Adj Gross	Freerider/ Spillover %	Net -To - Gross Ratio	Net Savings
Program A	Measure 1	10	10	100	95%	950	10%	0.9	855
Program A	Measure 2	5	4	50	90%	180	20%	0.8	144
Program A	Measure 3	10	10	50	100%	500	0%	1.0	500
	<b>Prog Total</b>					<b>1,630</b>			<b>1,499</b>
Program B	Measure 1	10	10	100	95%	950	40%	0.6	570
Program B	Measure 2	20	21	25	90%	473	10%	0.9	425
Program B	Measure 3	20	20	25	100%	400	0%	1.0	400
	<b>Prog Total</b>					<b>1,823</b>			<b>1,395</b>

**Interaction with the MPSC Evaluation Collaborative**

Once general consensus on this document is achieved by the MPSC evaluation collaborative, the group will decide on what and how results from the EO provider’s impact evaluation are presented. Specifically, the evaluation collaborative will need to determine:

- A general template for reporting evaluation results.
- Timeline and schedule for presentation of results.

We propose the 2010 December collaborative meeting will be used to obtain consensus on the energy savings adjustment process, general reporting guidelines and schedules.