

Measured Savings Program Implementation Guide: A "Program in a Box" for the IRA HOMES Program

This document was prepared by a collaboration of individuals and organizations with experience in and a passion for measured program models.

In this guide you will find details on the core components for consideration in a successful measured program. Each state will have the opportunity to choose how each element is best implemented within their context - and per guidance.

We welcome questions and comments on the path to making your measured program a success.

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Glossary

Advanced Measurement & Verification (AM&V): An enhanced version of measurement & verification (M&V) that can be applied to monthly, daily, and hourly energy usage data, and takes advantage of advanced technologies, such as smart meters, sensors, and data analytics tools, to more accurately and efficiently measure, monitor, and verify energy savings.

Aggregator: An 'aggregator' is a commercial, nonprofit, or government entity that may receive rebates provided under the Inflation Reduction Act Home Energy Rebate Programs (HOMES and/or HEEHRA) for one or more portfolios, consisting of one or energy efficiency retrofits, provided that that same entity does not receive administrative funds from the HOMES or HEEHRA programs from that same state or territory. Aggregators are responsible for marketing the program(s) to homeowners and/or contractors, submitting required program data (including homeowner energy data where necessary), and potentially providing other value-added services (lead generation, financing, etc.).

Certification Report: A formal document that verifies and validates the results of an energy efficiency project or program, typically prepared by a qualified third-party expert or organization. The certification report provides an in-depth analysis of the energy-saving measures implemented, the methodology used for measurement and verification (M&V), the energy and cost savings achieved, and the overall performance of the project or program.

Coefficient of Variation of the Root Mean Squared Error (CVRMSE): A normalized statistical metric used to evaluate the accuracy and performance of energy models, forecasts, or predictions in comparison to actual energy consumption data. CVRMSE is calculated as the ratio of the root mean squared error (RMSE) to the mean of the observed values, expressed as a percentage. A lower CVRMSE indicates a higher level of accuracy and better model performance, while a higher CVRMSE suggests a greater degree of error or deviation from the actual values. In the context of energy efficiency programs, CVRMSE is often used to assess the quality and reliability of measurement and verification (M&V) models or to compare the performance of different modeling techniques.

DOE: The United States Department of Energy.

High-Efficiency Electric Home Rebate Act (HEEHRA): A new program developed in the Inflation Reduction Act that supports electrification projects in single-family and

multifamily residential units. These point-of-sale rebates are available only to low- or moderate-income (LMI) households.

Home Energy Retrofit: A process of upgrading or modifying an existing residential building to improve its energy efficiency, reduce energy consumption, and enhance overall comfort and performance.

Home Energy Performance-Based, Whole-Home Rebates (HOMES): A new program developed in the Inflation Reduction Act that incentivizes whole-home retrofits in both single-family and multifamily dwelling units, specifically based on measured performance. Rebate amounts are tied to delivered savings impacts and are doubled for low-income households.

Hourly Incentive Rate: A rebate structure that recognizes the value of saving energy or reducing demand at specific hours or time periods.

IRA: Inflation Reduction Act of 2022

Low- and Moderate-Income (LMI) Applicant: An individual or household with an income level that falls below a specified threshold, defined in the Inflation Reduction Act as less than 80% of the area median income (AMI) or federal poverty guidelines for the HOMES program.

Measured Performance Pathway: An energy efficiency program design that relies on quantifying the actual performance of the intervention based on data collected before and after an intervention.

Measurement & Verification (M&V): A systematic process for determining and documenting the impacts resulting from an energy efficiency program or project and includes quantifying changes in energy use, peak demand reductions, and/or avoided greenhouse gas emissions.

OpenEEMeter: The Open Energy Efficiency Meter (OpenEEMeter) is an open-source software method and code base designed to measure and verify changes in energy consumption, resulting from energy efficiency projects and programs.

Open Source Software: Applies to software whose design, source code, and specifications are available under an unrestricted license and publicly available, allowing anyone to view, use, modify, and distribute the material. The most widely accepted definition and criteria for Open Source Software comes from the [Open Source Initiative \(OSI\)](#).

Program Participation Agreement: A formal contract or document that outlines the terms, conditions, and responsibilities of both the program administrator and the participant in an energy efficiency program.

Program Administrator (PA): The organization or agency responsible for overseeing and managing the energy efficiency program, including the development, design, implementation, and evaluation of the program. Program Administrators allocate resources, set program goals, and monitor progress, ensuring that the program delivers the desired energy savings and meets regulatory requirements. In the context of the Inflation Reduction Act Home Energy Rebate programs, State Energy Offices will be the PAs unless they transfer this responsibility.

Program Implementer: A person, team, or organization responsible for executing an energy efficiency program or project, ensuring that the proposed energy-saving measures are installed, operated, and maintained correctly. Implementers may include energy service companies, contractors, consultants, or other professionals with expertise in energy efficiency technologies and practices.

Project Completion Form: A document or form submitted by the Implementer or participant of an energy efficiency project or program, confirming that the energy-saving measures have been successfully installed, commissioned, and tested according to the specified requirements and standards.

Project Site: The specific physical location or facility where an energy efficiency project or program is implemented.

SEO: State Energy Office

Time-of-Use (TOU) Rates: A variable pricing structure used by utilities to charge customers for electricity based on the time of day when the energy is consumed.

Third-Party Certification Provider: An independent, external organization or entity that specializes in evaluating, verifying, and certifying the performance, quality, or compliance of products, services, systems, or projects, based on established criteria, standards, or regulations.

1. Program Overview

1.1. Program Description

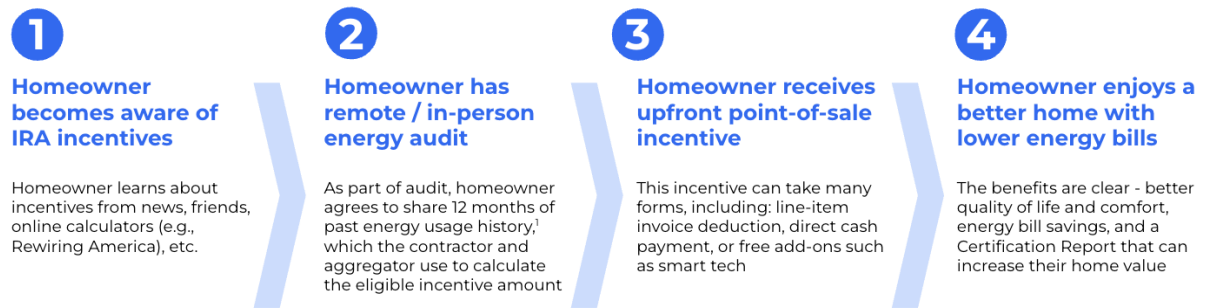
The Measured Home Energy Performance-Based, Whole-House Rebates (HOMES) Performance Rebates Program (“Program”) incentivizes the retrofit of homes and multifamily buildings across [STATE].

The Program provides performance-based incentives to Aggregators of home energy retrofits (“projects”) that reduce total energy usage, peak energy demand, and/or greenhouse gas reductions (weatherization, heat pumps, etc.). Aggregators develop a portfolio of projects and absorb the risk for the measured performance of the installed projects. Performance is measured at the whole-house level, post-retrofit, using open source advanced measurement and verification software and methods with customer-authorized energy consumption data.

Aggregators can elect to directly incentivize contractors, homeowners and/or multifamily-building owners to complete projects, including providing upfront, at-risk rebates or other incentives including, but not limited to, preferential financing, sales and marketing support, and/or other value-added products and services.

The program enables a simple process for homeowners - from awareness to a successful project, as shown in Figure 1.1.

Figure 1.1. Homeowner Journey



Contractors - entity physically completing the energy efficiency retrofit work within the home

Aggregators - entity that creates a portfolio of home energy retrofits and takes savings performance risk

[1] If the homeowner decides to move forward with the work, they must also agree to share 12+ months of go-forward energy usage during the measurement period.

1.2. Objectives

The objectives of the Program are to:

- Reduce total home energy usage, peak energy demand, and/or greenhouse gas emissions.
- Equitably distribute available funds to LMI households that have high energy burdens.
- Ensure that public dollars are spent on actual, measured energy reductions.
- Incentivize quality energy retrofits, particularly with LMI households, that provide residents of single-family and multifamily buildings with direct benefits including, but limited to, comfort, health, safety, increased property value, energy bill savings, and improved resilience.
- Stimulate and boost demand for local and regional businesses that provide high-quality energy efficiency services, particularly in traditionally underserved areas.
- Demonstrate market transformation outcomes that can be leveraged by future programs including, but not limited to:
 - Quantification of the grid and greenhouse gas reduction benefits of home energy retrofits across geographies and measures.
 - Private market investment in the home energy retrofit market, including, but not limited to, investments in customer outreach and education, financing (debt and equity), and equipment.
 - Creation of scalable measured savings systems and processes that can be leveraged by future program administrators and implementers.

1.3. Program Advantages

- **Taxpayer Accountability and Consumer Protection:** Measured Savings Programs ensure accountability in taxpayer money being spent to achieve real emissions reductions as well as consumer protection around the energy savings performance of projects. Taxpayer dollars are only given out based on realized energy reductions. Most importantly, Measured Savings Programs provide accountability to homeowners that invest in energy efficiency projects since aggregators have a financial incentive to ensure accurate energy savings estimates.
- **Equity Impact in Frontline Communities:** Measured Savings Programs will provide larger incentives to low- and moderate-income (LMI) households. Unlike the capped incentives in the modeled pathway, the measured pathway offers potentially higher incentive levels. LMI homeowners may be eligible for \$14,000 or more in incentives for comprehensive projects under the measured savings pathway, versus a cap of \$8,000 under the modeled savings pathway (both pathways have a cap of 50% of project costs for market rate and 80% of project costs for LMI).
- **Homeowner and Contractor Simplicity:** Measured Savings Programs are simpler and easier for homeowners and contractors that participate in the HOMES program. Aggregators reduce soft costs by taking on many program application functions (and cash flow risk) that are normally borne by contractors. Aggregators provide payment

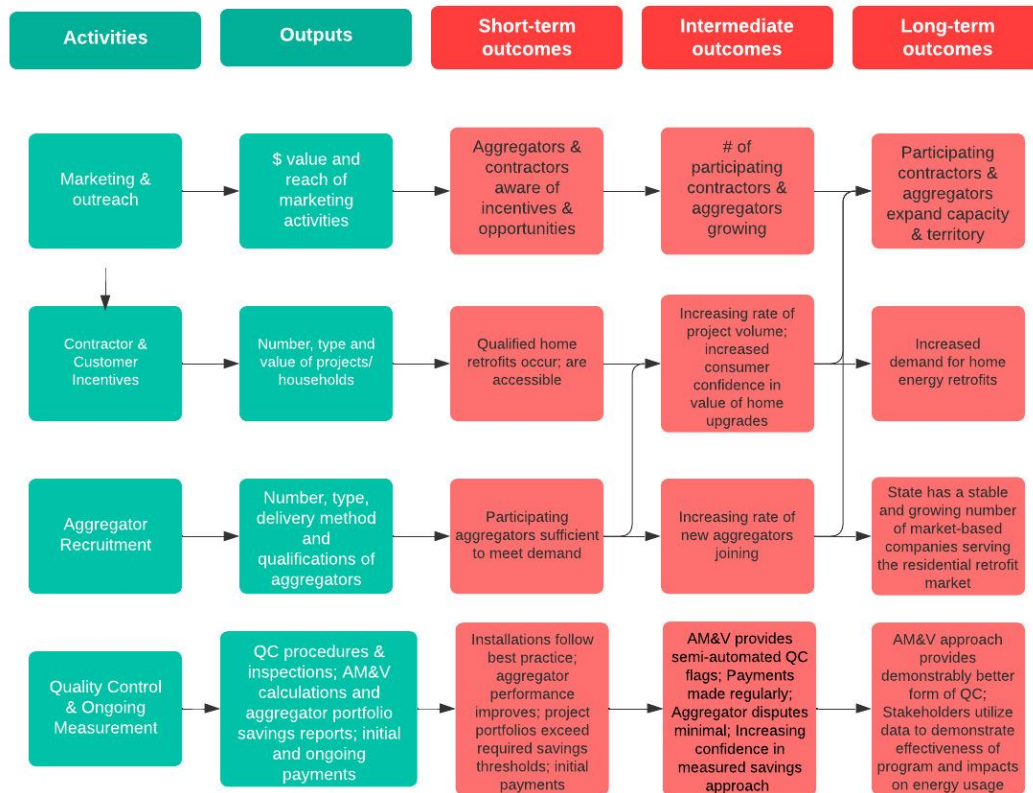
up front to contractors and homeowners, taking on the risk and responsibility of project performance over time. Measured Savings Programs will ease burden on contractors, helping a broader set of contractors and trade allies (including minority and women-owned business) participate in the program.

1.4. Program Logic

Figure 1.2 shows an illustrative logic model diagram for a measured savings program. States and jurisdictions will be in different phases of energy efficiency program lifecycles and will have varying levels of Aggregator, contractor, and homeowner awareness and participation, so each administrator should consider the activities, outputs, and outcomes for their areas.

Outcomes are the less certain theoretical changes that are expected to result from program activities. Outcomes can occur as soon as program activities begin and can continue to occur after a program ends. For a measured savings program, we define short-term outcomes as those expected to occur within the first two years of program launch. Intermediate outcomes are expected to occur within 1 - 4 years of program launch, and long-term outcomes might be measurable only after the precursor activities, outputs, and outcomes have occurred. Thus, long-term outcomes may occur after the end of the program cycle.

Figure 1.2: Logic Model Diagram for Measured Savings Program



2. Stakeholders

2.1. Responsibilities

Table 2.1 illustrates the roles and responsibilities for the key stakeholders of measured savings programs.

Table 2.1: Roles and Responsibilities for Key Stakeholders

Stakeholder	Example Roles and Responsibilities
Program Administrator	Allocates funds in accordance with laws and regulations
Program Implementer	Creates and runs measured savings program, reports to Program Administrator
Advanced M&V Provider	Operationalizes open source AM&V methods and tools to calculate impacts from changes in energy consumption (energy savings, peak demand reduction, and/or greenhouse gas reductions)
Data Provider(s)	Supplies data for energy baseline and savings calculations
Aggregator	Develops projects and takes on energy savings performance risk
Contractor	Completes the home energy retrofit project
Homeowner	Opts in to program and receives energy bill savings, quality-of-life benefits, and discounted home energy retrofits

Figure 2.2: Contractual Relationships Between Key Stakeholders

Program Administrative Model - **Contracting & Agreements**

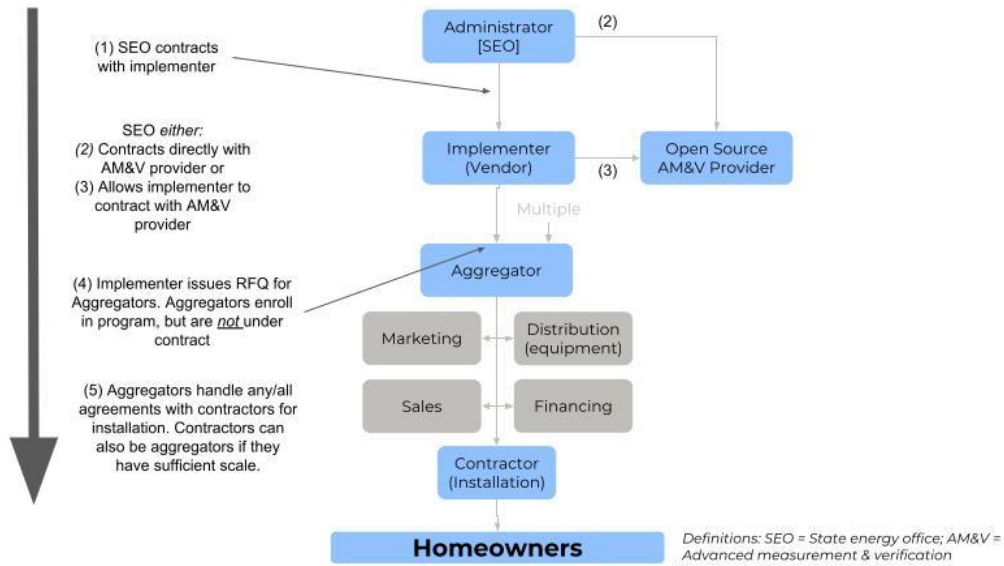
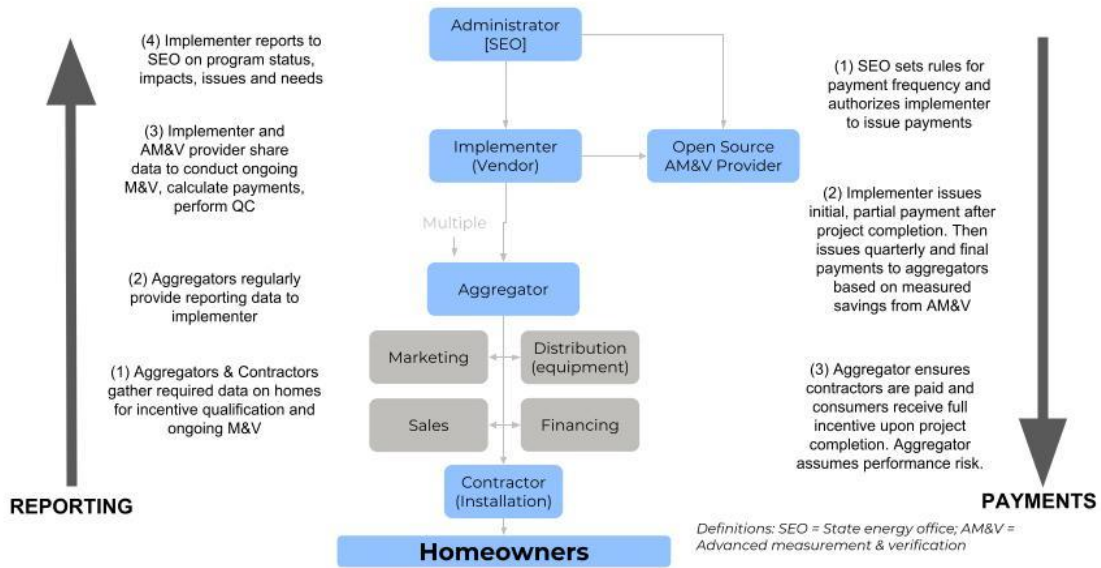


Figure 2.3 shows how reporting data flows up from homeowners and payments flow down from Program Administrators. Establishing clear, simple reporting requirements and responsibilities will be key to a successful measured savings program. Note that SEOs can define payment cadence schedules that are best for their programs, and these can be refined and adjusted over time depending on feedback from program stakeholders.

Figure 2.3: Reporting and Payments Data to and from Program Administrators

Program Administrative Model - Reporting & Payments



3. Key Program Rules

3.1. Eligibility

This section describes the Program requirements that an Aggregator, Project Site, and project must meet for a project to be eligible for the Program. This section also describes the specific criteria an LMI applicant must meet to be eligible for the Program. Program eligibility is distinct from payment eligibility described in Section XX. Optional eligibility considerations are included at the end of this section.

3.1.1. Aggregator Eligibility

Any organization that meets the Program requirements for project enrollment is eligible to participate as an Aggregator in the Program. Aggregators must agree to and submit a signed Program Participation Agreement prior to project enrollment. Each project is submitted and enrolled with a Project Completion Form with predefined fields required for the program.

3.1.2. Project Site Eligibility

Enrollment approval is contingent on meeting the Project Site eligibility requirements described below. The Program will qualify sites based on energy usage data sufficiency, baseline model fit, and other usage characteristics.

Project Site eligibility requirements include:

- Project Site must be a single-family or multifamily building located in the state of [State].
- Project Site must pass the Pre-Enrollment Data Sufficiency and Eligibility Check:
 - Project Site must have a valid address according to the United States Postal Service.
 - Project Site must have energy consumption data that represents 12 or more months of energy usage.
 - Project Site must have a baseline model fit of less than 1.0 CVMSE for eligibility.
- If the Project Site has an on-site solar system, installation of the system must have been completed at least 12 months before the project installation or have available net metering data.
- Project Site is not currently receiving a federal grant or rebate for the same single upgrade (pending DOE guidance). Note this does include any federal tax credits, including the IRA 25C tax credit, which could potentially be used as additive to incentives from the Home Energy Rebate programs, pending Internal Revenue Service guidance.

Following enrollment, Project Sites will be routinely cross-referenced for receipt of a federal grant or rebate. Sites in violation will be disqualified from the portfolio.¹

3.1.3. Project Scope Eligibility

The measured savings program is measure-agnostic, meaning any specific project may include a range of technologies and services that will lead to reduced energy consumption. Incentive payments to Aggregators are based on demonstrated changes in energy consumption for all eligible projects in a portfolio. Portfolios must demonstrate at least 15% energy savings (measured in kWh equivalent) to be eligible for payment, but this criteria is not required at enrollment. Aggregators will focus on projects that will deliver at least 15% or more to ensure payment.

Any project scope that reduces total energy usage is eligible, including lighting, HVAC, water heating, building envelope, refrigeration, and controls-based technologies or combinations thereof. Electrification projects are also eligible provided they reduce total energy usage. To ensure projects are focused on improved energy efficiency and resilience for customers, [STATE] has introduced the following limitations on eligible technologies including [insert any dis-allowed technologies].

3.1.4. Low- and Moderate-Income (LMI) Eligibility

Project Sites occupied by an LMI household or where LMI households occupy 50% or more of the dwelling units are eligible for the LMI Incentive Rate (see section 4.1. LMI Incentive Rate Determination).

A household qualifies as LMI if the individual or residents in the home have a total annual income of less than 80% of the median income of the area in which they reside, as reported by the U.S. Department of Housing and Urban Development, including an individual or residents that have demonstrated eligibility for another federal program with income restrictions equal to or below 80% of area median income.

For the purpose of the Program, a household is defined as an individual living alone or a family with or without children [or a group of individuals living together as one economic unit]. Income is defined as annual gross income, which includes but is not limited to the following: wages, unemployment, worker's compensation, Social Security, Supplemental Security Income, public assistance, veteran's payments, survivor benefits, pension or retirement income, interest, dividends, royalties, income from estates, trusts, educational assistance, alimony, child support, assistance from outside the household, and any other sources of income.

¹ States may wish to devise "off ramping" solutions for home or building owners that do not meet eligibility criteria but given limited budgets this may not be advisable. Options may include tracking ineligible sites to other more appropriate programs or allowing ineligible sites in the program but using alternate calculation approaches if they do not make up a sizable portion of the portfolio.

For a single-family home to qualify, LMI households must complete and pass income verification. Homeowners must provide proof of eligibility through one of the following:

- Proof of participation in a federal program with income restrictions at or below 80% of area median income, including:
 - Utility Bill Payment Assistance (LIHEAP, LIH, WAP)
 - Public assistance (TANF)
 - Other programs
- Provide a completed Household Summary Form and 4506-C Form for each household member. The homeowner or building owners cannot be claimed as dependents. If you have filed your taxes for the year your vehicle was purchased or leased, additional financial documentation may be necessary.
- Self-Certification or other appropriate pathway as determined by the State

For a multifamily building to qualify, building owners, property managers, and/or residents must provide proof that LMI households occupy 50% or more of the dwelling units through one of the following:

- Participation in federal Section 8 Housing Choice Voucher Program, Public Housing, Low-Income Housing Tax Credit (LIHTC), or other similar state programs
- Self-Certification or other appropriate pathway as determined by the State

[State] reserves the right to periodically audit for income-qualification. If a site is found to be ineligible for the LMI Incentive Rate, the [State] may revoke all incentive payments remitted from the Aggregator of record.

3.1.5. Optional Eligibility Criteria

3.1.5.1. Aggregators: Aggregator Program terms and conditions can include additional state requirements.

3.1.5.2. Project Sites:

3.1.5.2.1. Administrators can routinely screen for eligibility across all households in the Program jurisdiction, with status provided to Aggregators and homeowners or building owners by either an address or other unique identifier.

3.1.5.2.2. The threshold for baseline model fit may be changed. Recommended criteria is less than 1.0 CVRMSE for eligibility.

3.1.5.2.3. If partnering with utilities, eligibility screening could include having an active residential account with an account identifier (Account ID).

4. Incentives

4.1. Standard Market Rate and LMI Incentive Calculation

The Standard Market Rate Incentive is calculated via the formula in Figure 4.1 below. For a project or portfolio that achieves at least 15% energy savings, the incentive rate equals \$2,000 for a 20% energy usage reduction for the average home or dwelling unit in [State].

The [state's] average annual energy usage is the sum of the average annual electric usage and the average annual natural gas usage. Non-electric usage will be converted into a kilowatt-hour equivalent². After determining the incentive rate in \$/kWh, the incentive can be converted into a natural gas equivalent of \$/Therm.

Figure 4.1: Standard Market Rate Incentive Formula

$$\text{Standard Incentive Rate} = \frac{\$2,000}{20\% * \text{Average. Annual Energy Usage (in kWh)}}$$

where Average Annual Energy Usage = Average Annual Electric usage + Average Annual Natural Gas usage (in kWh). Annual Electric and Natural Gas usage will be provided by the [state].

Figure 4.2: Example Incentive Rate Formula for State of Illinois

For the state of Illinois, the Standard Incentive Rate calculation is illustrated below.

Avg. Annual Electric Usage ³	8376	kWh
Avg. Annual Gas Usage ⁴	772	Therms
Avg. Annual Gas Usage (converted to kWh) ⁵	22,630	kWh
Avg. Total Electric + Gas Usage	31,006	kWh
20% * Avg. Total Electric + Gas Usage	6,201	kWh
Standard Incentive Rate	0.32	\$/kWh
Standard Incentive Rate	9.65	\$/Therm

LMI Incentive Rate is double the market rate incentives per legislation.

Figure 4.3: LMI Incentive Rate Formula

$$\text{LMI Incentive Rate} = \frac{\$4,000}{20\% * \text{Avg. State Annual Energy usage (in kWh)}}$$

where Average Annual Energy usage = Average Annual Electric usage + Average Annual Natural Gas usage (in kWh) Annual Electric and Natural Gas usage will be provided by the [state]

² Conversion used: 1 Therm = 29.3 kWh for natural gas; other delivered fuels will need conversions.

³ Source: <https://www.eia.gov/electricity/data.php>

⁴ Source: https://www.eia.gov/dnav/ng/ng_cons_sum_a_EPG0_vrs_mmcfc_a.htm

⁵ Conversion used: 1 Therm = 29.3 kWh

For states with hourly AMI data, the Standard Incentive Rate is utilized to calculate Hourly Incentive Rates in the section below.

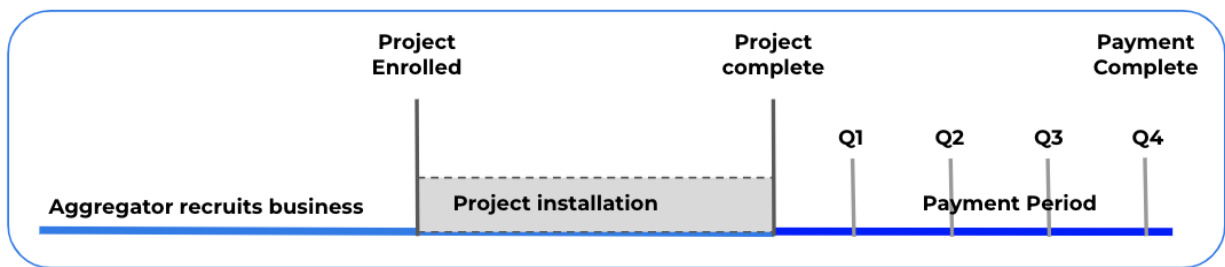
4.2. Hourly Incentive Structures

Hourly Incentive Structures available in Appendix 12.6.

4.3. Aggregator Payment Cadence

Aggregators will be paid incentives for delivered impacts of their portfolios following the completion of pre-defined quarterly measurement periods. The portfolio is defined as all projects that are installed by the first day of the quarter and have energy usage data for less than 13 months post-project. At 12 months of maturity, a project has been fully paid and is removed from the portfolio. Projects completed during a payment period constitute an aggregators' portfolio.

Figure 4.4: Project Payment Periods



The quarterly measurement periods are:

- January through March (Quarter 1)
- April through June (Quarter 2)
- July through September (Quarter 3)
- October through December (Quarter 4)

Payment is expected to be remitted within 60 days following the end of the previous measurement period. For example, payments for Quarter 1 will be remitted by May 30. Any deviation from this timeline will be communicated to Aggregators and resolution on payment will be subject to contract terms in the Program Participation Agreement .

States can also provide optional payment schedules and guarantees on payment timing that meet their specific objectives.

5. Data

Energy usage data is paramount to the successful day-to-day operation of the Program, as well as the ongoing M&V process. Aggregators are responsible for the collection of energy usage data for homeowner projects, and they are encouraged to collect that data through whatever means possible. Where utilities are willing and able to share data with Program Administrators, Program Implementers are encouraged to collaborate with utilities within the state to establish routine data transfer pipelines while the Program is active.

5.1. Data Collection

The [OpenEEmeter methods](#) detail necessary data and sufficiency requirements for the establishment of appropriate baselines in [Section 2. Data Management](#). The Program will work with Aggregators to ensure that Aggregators have a consistent and reliable means to access customer usage data, and establish data transfer plans that meet the open source M&V data requirements. Data must be delivered in a clean, readable format. Any duplicated data will be thrown out. Any overlaps in energy usage datasets will resolve to the dataset with the largest time period.

Aggregators will collect the site, meter, and project information required for proper weather-station matching. Project start and end dates will also be collected for the identification of baseline, blackout, and reporting periods to meet the open source M&V specification. Data collected for each project includes participant, DAC/LMI qualification, location, meter ID, date of retrofit, project scope of work, projected energy savings, and project costs. Where necessary, Aggregators will collect and provide 12 months of utility energy consumption data.

5.2. Data Flexibility

Aggregators may collect energy usage data through multiple data pathways to accurately measure the energy usage reductions of each project. It is required that energy usage data is collected pre- and post-project installation to guarantee precise energy reductions and transparent settlement. In all cases, homeowner consent is required for Aggregators, Implementers, Administrators, or anyone else to access and/or analyze homeowner energy usage.

Data can be collected via several, non-mutually exclusive methods including but not limited to:

- Independent third-party software that provides utility meter data to Aggregators or any other authorized party
- Utility-provided software that provides utility meter data to Aggregators or any other authorized party

- Utility-provided software that provides utility meter data to Implementers for the purpose of AM&V
- Energy bills provided by homeowners or delivered fuels providers
- Connected solutions such as sensors, smart electric panels, and other sensing/metering technology

5.3. Data Access and Transfer

Data access and transfer responsibilities will depend on the program implementation model, state rules, and existing technical capabilities for enabling customer data access. The following illustrates potential implementation models that will guide the data transfer approach.

- **Distributed Implementation:** Aggregators responsible for collecting energy usage data, and providing that data to the Program Administrator (SEO or Designee) in a prescribed format to enable M&V for incentive payments. Program Administrators, Implementers, Aggregators, and any other entities with access to the data (e.g. Department of Energy) is responsible for data handling infrastructure, data security and data protection.
- **SEO Implementation:** Load serving entities transfer energy consumption and customer information data to the SEO under a security agreement. Data is available for targeting (if population data is accessible), and to conduct M&V for measured approach. The SEO would be responsible for having appropriate data handling infrastructure, data security and data protection. They could use their infrastructure to enable secure access to Aggregators upon customer authorization.
- **Load Serving Entity Implementation:** A load serving entity would implement the program alongside existing programs and process data on their own premise. Aggregators would have visibility to customer authorized consumption data from a secure platform. The SEO would receive derivative outputs, not individual data, on performance to validate payments and program impacts in aggregate, but would not be responsible for data infrastructure or data security.
- **Third Party Program Implementer:** Energy consumption and customer information data would be provided to and protected by SEO's third party Implementer under a security agreement. Data is available for targeting (if population data is accessible), and to conduct M&V for measured approach. SEO would have access to derivative data, not individual data. The Third Party agent would be responsible for data handling infrastructure, data security and data protection. Third Parties handling individuals energy consumption data should have SOC2 certification and appropriate cyber insurance. The Third Party would be responsible for providing secure access to aggregators upon customer authorization.

In each scenario any vendor or third party that is handling energy consumption data on behalf of the state agency or the load serving entity should carry cyber insurance for handling and protecting customer-authorized data. If non-participant or population data is used for targeting third parties should have [SOC2 certification](#).

5.4. Data Security

Data security and customer privacy are essential for effective, trustworthy customer programs. The entity managing AM&V for the program will be required to have rigorous data security procedures and protocols at every step of data transfer, analysis, and reporting for handling billing and/or usage data and customer information. This entity must also demonstrate SOC2 compliance and certification, which ensures best-in-class security and data management practices that meet the required “Trust Services Criteria”: security, availability, confidentiality, processing integrity, and privacy. Other agents in the market handling customer-authorized data may only need to have reasonable data protection practices and carry cyber insurance in case a breach causes direct harm.

6. Reporting

6.1. Program Metrics

Program Administrators should design a set of program metrics that track key indicators that point to program success or failure, but also recognize that the importance of certain metrics will change over time and that participants should be prepared to change their reporting as the program matures.

Some key aggregate metrics that should be tracked and reported on from the outset include tracking the number and value of rebates redeemed by:

- Low- vs. moderate-income households
- Zip code and census tract
- Renter vs. owner

Program Administrators should consider collecting the following information:

- Individual contact information and the right to review their energy data pre- and post upgrade (13 months before and 13 months after).
- The specific measures installed per home, per address (with zip code).

Program Administrators should specify required and optional post-upgrade evaluation procedures that may be undertaken on a statistically significant number of projects including, but not limited to, the following:

- Quality-control inspections, including equipment right-sizing.
- Initial follow-up outreach should be completed by phone/email within one month for satisfaction, three months, and 13 months for weather-normalized savings using energy consumption data.

7. Measurement & Verification Overview

The program implementation plan is accompanied by and dependent on successful implementation of the M&V plan for the Measured HOMES Performance Rebate Program (“Program”). The M&V Plan complies with all M&V requirements for the Measured Performance Pathway (Home Energy Performance-Based, Whole-House Rebates) in SEC. 50121 of the IRA, and DOE guidance.

The core elements of the M&V plan for this program are the following:

- All methods and software used to determine savings impacts are open source.
 - [STATE] has selected the OpenEEmeter as the open source AM&V method and codebase for this program.
- All savings are calculated using customer-authorized energy consumption data using weather-normalized counterfactuals based on the 12 months of energy usage before the Program intervention.
- M&V methods and software are applied consistently across each site in the Program. Exceptions for anomalies will be handled with consistent application of the rules outlined in the M&V plan.

The M&V plan provided in [Appendix X] is the basis of aggregator payment and therefore must be established prior to Program launch and any updates must be communicated in advance to Aggregators. Payments cannot be retroactively adjusted based on updates to the M&V plan without agreement of all parties.

8. Program Integration

8.1. Weatherization Assistance Program (WAP)

Based on IRA legislation, combining weatherization assistance (a federal grant) with the HOMES or HEEHRA incentives would not be allowed. If the state has matching funds locally for WAP those funds could complement HOMES and HEEHRA in the same way a state/utility program could.

8.2. HEEHRA

Based on IRA legislation, HEEHRA and HOMES incentives can be combined but cannot be used for the same technology. In many cases, the programs may not need to be combined because the incentive levels are significant in both programs.

The HEEHRA rebates are specifically designed to overcome the cost and availability barriers for discrete electrification technologies. The HOMES incentive, in the measured path, is based on actual energy savings. As such, it may be allowable (pending DOE guidance) to use HEEHRA and HOMES incentives in the same household as long as the incentives are used for different measures. For example, HEEHRA rebates can be used to upgrade an electrical panel, a complementary step toward utilizing HOMES incentives for energy-reducing installations. The two programs are overcoming different market barriers and therefore are reasonable to combine. The cap on 50% and 80% of project cost for market rate and LMI customers protect against over-compensation.⁶ The fixed incentive for electrification technologies can be passed directly through to the customer.

Aggregators in the HOMES program can document when/if a HEEHRA incentive is used as part of the project, but no adjustments to the measured performance calculations would be necessary.

8.3. State/Utility Programs

The legislation allows the HOMES performance incentives to be layered with existing utility programs and federal tax credits. Programs already providing incentives can use federal dollars to help further reduce the project's cost to customers and/or increase the depth and longevity of any given project.

Leveraging both ratepayer and federal investment can drive greater demand without requiring new and complicated program designs. Paying for performance with HOMES ensures that current deemed programs can also deliver real and greater savings to

⁶ Incentive Layering principles were adopted in [recent regulation](#) HOMES is designed to address "distinct market needs" (home performance) from the electrification technology-specific HEEHRA cost and availability barriers.

customers, and when AMI is present, time-based incentives can be sent to drive greater peak savings and greenhouse gas reductions.

The deemed technology rebates available in most utility programs are specifically designed to overcome the cost and availability barriers for high-efficiency technologies. The HOMES incentive, under the measured path, is based on the actual impacts and is designed to ensure quality installations that deliver bill savings, greenhouse gas reductions, and grid value. The two incentives address different market barriers and therefore are reasonable and justifiable to combine. The cap on 50% and 80% of project cost for market rate and LMI customers protect against over-compensation to aggregators in HOMES. The fixed incentive for technologies can be passed directly to the customer.

States can allow utilities to claim savings achieved via complementary incentives or can restrict utilities to savings claims based on prescribed deemed savings values. It is not necessary to attribute the energy savings since HOMES's policy intent represents a unique value stream above and beyond existing programs. Programs should not use self-report surveys after implementation. A best practice for handling attribution is for programs with common objectives to recognize that they each have differing roles and discrete barriers that they must each address in getting to a common objective. In addition, entities involved in funding a program can define a value stream they are supporting to achieve a particular objective.

A SEO, for example, may wish to "claim" the bill impacts, and a utility partner would "claim" the grid impacts, to align with their savings goals. Both influenced the action, combined available funding resources, and can share credit for achieving a successful outcome. Tracking how federal dollars accelerated investment (scope, scale, or depth) in home upgrades can also speak to the shared success of joint influence beyond the status quo (another means of assessing attribution). In any event, attribution should be based on whether the intervention resulted in energy savings impacts relative to the population.

9. Certifications

The aggregator will transfer to the Third-Party Certification Provider the data necessary for the certification, including:

- Project location (address)
- Date of retrofit
- Baseline characteristics of home (as available)
- Upgrades installed during retrofit (project scope of work)
- Project costs
- Projected and/or actual energy savings
- Projected and/or actual home energy consumption post-upgrade

The Certification Report will show an estimate of the cash flow over time resulting from the home's post-project energy consumption as compared to an average home of the same type (climate zone, vintage, square footage, primary fuel type, etc.). This data will also be shown in the Appraisal Institute's Green and Energy Efficiency Addendum.

The Certification Report will detail the improvements made in the home, and will explain the benefits of the home features in language that the homeowner and potential buyers can understand.

This information in the Certification Report will help the homeowner ensure that the value of the improvements funded with a HOMES rebate will be captured when they sell or refinance the home.

Homeowners will be informed that the Certification Report is one of the program benefits by participating contractors. The Certification Report will be provided by the Third-Party Certification Provider to the homeowner via email upon project completion. Twelve to 15 months later, the Certification Report will be re-issued with updated measured energy savings.

Certification will play an important role in driving market transformation by creating a cycle in which energy efficient, high-performing homes are visible and valuable at time of sale.

10. Marketing & Outreach

10.1 Marketing & Outreach Overview

The purpose of the Marketing & Outreach Section is to provide guidance on how to effectively promote the Measured HOMES Performance Rebates Program to potential Aggregators, contractors, homeowners and the general public.

Marketing & Outreach is critical to the success of the program, as it will help attract Aggregators and contractors and create a recognizable brand for the program. The primary audience for this section is the staff at SEOs, who will be responsible for implementing the Marketing & Outreach Plan.

10.2 Branding

- The Program name and logo should be memorable and easily recognizable, and should communicate the goals and benefits of the program.
- A tagline can be used to convey a key message or benefit of the Program in a concise and memorable way.
- The Program messaging should be consistent across all marketing materials and communications, and should focus on the direct benefits of the Program for homeowners and multifamily building owners
 - For some states, it may be important to also highlight the broader grid and environmental benefits.
- SEOs should take into account current utility or other energy efficiency programs, as it may be advisable to make this Program distinct, or in some cases, SEOs and utilities may choose to work closer together and the branding may reflect that.

10.3 SEO Marketing & Outreach Plan

The SEO Marketing & Outreach Plan should include a clear overview of the tactics and strategies that will be used to promote the Program to potential Aggregators and contractors. SEOs should focus on all of the marketing efforts that do not include direct to homeowner acquisition. Direct-to-homeowner marketing may have several negative consequences:

- Homeowners will respond to this marketing and then contact the SEO for leads and references, and state rules typically prohibit promoting specific businesses. Therefore this creates wasted touchpoints and leaves homeowners frustrated.
- If states purchase digital and written ad space, they drive up the cost for the market actors (Aggregators, contractors, etc.) by creating competition for keywords and target platforms, etc.
- Aggregators and contractors have well-developed and sophisticated methods for marketing to and attracting their customers. SEOs may create duplicative or confusing messaging that reduces the effectiveness of these efforts.

- SEOs will draw down limited administrative funds for marginal benefits.

10.3.1 The following are some key steps to create a successful Marketing & Outreach Plan:

- **Create a Program Brand:** The first step in the outreach plan is to create a program brand that is easily recognizable. This includes designing a logo, creating a tagline, and using consistent messaging across all marketing channels.
- **Identify Target Audiences:** SEO staff should identify and prioritize target audiences for the Program, primarily contractors and Aggregators. This will help tailor the outreach efforts and messaging to each audience.
- **Develop a Marketing Strategy:** The SEO staff should develop a marketing strategy that may include a Program website, social media accounts, and email marketing campaigns to reach a wider audience.
- **Create Marketing Materials:** The SEO staff should create marketing materials that are informative and engaging. These materials should explain the benefits of contractor and Aggregator participation in the Program and how to participate.
- **Organize Events:** Hosting events, such as webinars or in-person workshops, is an effective way to engage with the target audience. These workshops may be best-suited to attract Aggregators and educate contractors. SEO staff can organize events in partnership with local organizations and provide information on the Program, incentives, and resources available to participants.
- **Leverage Existing Networks:** SEO staff can leverage existing networks of contractors and energy efficiency professionals. This includes working with trade associations and other industry groups to promote the Program to their members.
- **Provide Resources:** The SEO staff should provide resources to participants to help them navigate the Program and complete energy retrofits successfully. This includes providing educational materials, training sessions, and technical assistance to Aggregators, contractors, and other stakeholders involved in the Program.

10.4 Metrics and Evaluation

SEO staff should track the success of their outreach efforts by monitoring participation rates, feedback, and other metrics. This information can be used to refine and improve the Marketing and Outreach Plan over time.

- Metrics for measuring the success of the marketing efforts include the number of Aggregators and contractors who participate in the Program, as well as feedback from participants and stakeholders.
- The marketing assessment plan should include a clear process for tracking and analyzing metrics, as well as a plan for making adjustments or improvements based on the results.

Examples of metrics may include but are not limited to:

- Contractor participation metrics: % / # of contractors that participate in the Program who did not previously participate in energy efficiency programs, as well as the % / # of associated projects completed by such contractors
- Work scope metrics: % / # of changes in work scopes toward deeper retrofits as a result of the Program design (e.g., HVAC contractor who historically has done traditional air conditioning replacements now focuses business on heat pumps)
- Homeowner participation metrics: % / # of homeowners that participate in the Program who did not previously participate in energy efficiency programs
- Homeowner incentive metrics: % / # of homeowners who elect for various forms of incentive payments within the Program (direct cash incentive vs. line-item deduction on invoice vs. free add-ons such as smart technology)
- Administrative costs: % / \$ in Program administrative costs relative to \$ administrative costs in other similar past / existing energy efficiency programs

11. Market Transformation Strategy

The Program is designed to transform the market for residential energy efficiency improvements such that when the rebate dollars are expended, market infrastructure and robust homeowner demand will support continued high-performing home upgrades. The value of the investments, as demonstrated in the measured outcomes, will be visible to customers, state agencies, and load serving entities enabling a future where energy efficiency and demand reduction can continue to be funded as a meaningful investment in our energy infrastructure.

Market infrastructure that will be developed or strengthened by the Program includes:

- Utility consumption data access: The necessary data transfer methods will have been developed to ensure that customers and third-party market actors can access utility bill data to support residential energy upgrades;
- Contractor business practices: The feedback on the actual energy savings that resulted from their installations will help contractors install high-quality projects that provide quality-of-life benefits and generate savings most effectively for their customers; it will also help contractors skew towards deeper retrofit scopes given rewards for deep energy savings (e.g., HVAC contractor shifts from traditional air conditioning work to full scale heat pumps);
- Contractor and homeowner participation: The design of the Program will address pain points from existing energy efficiency programs and provide added benefits in the form of higher and more flexible incentives, which will cause additional contractors and homeowners to participate in the Program who previously chose not to participate in such programs, leading to higher workforce capacity and number of households retrofitted;
- Demonstrated impacts from the aggregate impact of residential energy efficiency and grid-supportive load reduction will inform the size and scale of future investments in demand side resources for system planning and as a cost-effective decarbonization investment, including higher private capital investments as well.

The Program will also generate homeowner demand by making energy efficient, high-performing homes more visible and valuable through marketing and certification. Marketing, including marketing for HEEHRA rebates, will highlight the value of energy efficiency improvements for homeowners; given the high public profile these programs already have, homeowners will be much more likely to encounter and respond to this messaging than to the marketing of previous programs, including the American Recovery and Reinvestment Act stimulus programs. It will make existing energy efficiency programs more visible for their actual impacts and improve alignment of incentives across the industry toward tangible outcomes and building trust in energy efficiency as a resource. This may in turn help energy efficiency retrofits reach the tipping point along an adoption curve sooner than they otherwise would in existing programs.

12. Additional Resources for Program in a Box

The following appendices will be made available.

- 12.1. RFP templates
- 12.2. Contract Templates
- 12.3. Aggregator RFQ templates
- 12.4. M&V Plan: [Found Here](#)
- 12.5. FAQs
- 12.6. Hourly Incentive Structure

The following incentive structures apply only to jurisdictions where hourly, interval usage data is available. With the availability of hourly AMI data for electricity, the incentive structure can be weighted to reflect the variable value of each hour. Factors that may affect hourly value include avoided costs to the electrical grid, carbon intensity, or time-of-use rates. These factors can be combined, or used independently, to calculate a variable Hourly Incentive Rate. This will enable the program to reflect the value of savings impacts at a given time and encourage projects that optimize savings when they're needed most to achieve state goals.

[The following sections outline the step wise process to determine a variable hourly incentive rate using time of use as an example.]

12.6.1. Establish the Relative Hourly Value

With the availability of hourly AMI data for electricity, [STATE] has chosen to adopt an incentive structure weighted to reflect the variable value of each hour and season. Factors affecting hourly value in [STATE] include avoided costs to the electrical grid, carbon intensity, and time-of-use rates.

[STATE] has designed the variable hourly incentive to reflect a time of use rate. This will enable the program to reflect the value of savings impacts at a given time and encourage projects that optimize savings when they're needed most and optimize customer bill impacts to achieve state goals for the program.

Time-of-use (TOU) rates are frequently designed to motivate customers to use energy when it is less expensive to deliver, with higher rates at times when there is significant demand or grid constraints. Using TOU rates as the grounding for a variable hourly incentive aligns the incentives with program outcomes to save customers the most money and support grid reliability.

To ensure parity between the Hourly Incentive Rate and the Standard Incentive Rate, the Hourly Incentive Rate total value is equivalent to the Standard Incentive Rate or LMI Incentive Rate value. The only difference is that the rate for any given hour is not evenly distributed across the year.

For the state of [STATE], utility TOU rates will be utilized to determine the relative hourly value of electricity, providing an incentive for Aggregators to prioritize projects

and solutions that save energy during hours with higher TOU rates. The only change from the fixed incentive rate is that it is distributed across multiple hours. The relative hourly value breakdown is illustrated in Table 12.1.

Table 12.1: Example Hourly TOU Value Breakdown (Illinois)⁷

Super Peak			
Months Between	1	and	12
Hours (Beginning) Between	14	and	19
Avg. TOU Rate per hour	0.154 \$/kWh		

Peak			
Months Between	1	and	12
Hours (Beginning) Between	6	and	13
Avg. TOU Rate per hour	0.092 \$/kWh		

Off Peak Summer			
Months Between	6	and	9
Hours (Beginning) Between	20	and	5
Avg. TOU Rate per hour	0.064 \$/kWh		

Off Peak			
Avg. TOU Rate per hour	0.055 \$/kWh		

12.6.2. Calculate the Hourly Incentive Rate

With hour buckets and rates determined, the Hourly Incentive Rate is calculated utilizing the following formula:

$$\text{Hourly Incentive Rate} = \text{Relative Value Ratio} \times \text{Standard or LMI Incentive Rate}$$

Where:

$$\text{Relative Value Ratio} = \frac{\text{Fraction of Weighted Value}}{\text{Fraction of Total Hours}}$$

$$\text{Fraction of Weighted Value} = \frac{\text{Weighted Value (Rate} \times \text{Number of Hours in Bucket)}}{\text{Sum of Weighted Value for All Hour Buckets}}$$

⁷ [Average ComEd TOU rates are used to illustrate the process:]

https://www.comed.com/SiteCollectionDocuments/MyAccount/MyBillUsage/CurrentRates/91_RTOU_Supply_Charges.pdf

$$\text{Fraction of Total Hours} = \frac{\text{Number of Hours in Bucket}}{\text{Sum of Hours for All Hour Buckets}}$$

$$\text{Standard or LMI Incentive Rate} = \text{Incentive Rate as Calculated in Section 3.1 and 3.2}$$

This process is illustrated in Table 12.2, demonstrating the values used to determine the hourly electric incentive rates.

Table 12.2: Hourly Incentive Rate Calculations

Period	Number of Hours	Fraction Total Hours	Rate	Weighted Value (Hours * Rate)	Fraction Weighted Value	Relative Value Ratio	Hourly Incentive Rate (\$/kWh)	Hourly LMI Incentive Rate (\$/kWh)
Super Peak	2190	25.00%	\$0.154	\$337.28	41.28%	165%	\$0.53	\$1.07
Peak	2920	33.33%	\$0.092	\$267.44	32.73%	98%	\$0.32	\$0.63
Off Peak Summer	1220	13.93%	\$0.064	\$78.36	9.59%	69%	\$0.22	\$0.44
Off Peak	2430	27.74%	\$0.055	\$133.94	16.39%	59%	\$0.19	\$0.38
Total	8760	100.00%		\$817.03	100.00%			

The final incentive rates for the Program are consolidated in Table 12.3. All month and hour buckets are inclusive of endpoints. The rates are fixed for the program and any updates will be communicated to aggregators in advance. Incentives for non-electric impacts would have a fixed non-variable rate.

Table 12.3: Program Final Incentive Rates

Electric				
Period	Months	Hours Beginning	Base \$/kWh Rate	LMI \$/kWh Rate
Super Peak	1-12	14-19	\$0.53	\$1.065
Peak	1-12	6-13	\$0.32	\$0.63
Off-Peak Summer	6-9	20-5	\$0.22	\$0.44
Off-Peak	Remaining	Remaining	\$0.19	\$0.38

Non-Electric (gas or delivered fuel)				
Period	Months	Hours Beginning	Base \$/Therm Rate	LMI \$/Therm Rate
Annual	All	All	\$9.45	\$18.9