

DELAWARE EVALUATION FRAMEWORK

PREPARED FOR:

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DRAFT

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DEFINITIONS¹

Annual Demand Savings: The reduction in electric or gas demand associated with Energy Efficiency Savings, in a given year, within a defined boundary.

Annual Energy Savings: The reduction in electricity usage (kWh) or in fossil fuel use (in thermal units) associated with Energy Efficiency Activities, in a given year, within a defined boundary.

Attribution rate: The amount of energy and/or demand savings attributable to a program that includes the impact of free riders and spillover.

Avoided costs: The costs that are avoided by the implementation of an energy efficiency or demand response measure, program, or practice. For electricity, avoided costs may include the costs associated with generation (energy and capacity), transmission, distribution, and reliability. For natural gas, avoided costs may include the costs associated with the production, transportation, storage, and service that are variable to the amount of natural gas delivered to customers. Other costs may be included in avoided cost calculation such as the cost of controlling emissions that are not already embedded in the generation cost or the impact of the demand reduction on the overall market price for electricity.

Baseline: Conditions, including energy consumption and related emissions, that would have occurred without implementation of the subject measure or project. Baseline conditions are sometimes referred to as “business-as-usual” conditions and are used to calculate program-related efficiency or emissions savings. Baselines can be defined as either project-specific baselines or performance-standard baselines (e.g., building codes).

Benefit Cost Test: An indicator of the relative performance or economic attractiveness of any energy efficiency investment or practice. In the energy efficiency field, the present value of the estimated benefits produced by an energy efficiency program is compared to the estimated total costs to determine if the proposed investment or measure is desirable from a variety of perspectives (e.g., whether the estimated benefits exceed the estimated costs from a societal perspective).

Benefit Cost Ratio: The mathematical relationship between the benefits and costs associated with the implementation of energy efficiency measures, programs, practices, or emissions reductions. The benefits and costs are typically expressed in dollars.

Claimed Savings: Savings values reported by Program Implementer or Program Administrator after the subject energy efficiency measures or projects have been completed, but prior to an independent or third-party evaluation of the savings estimate. These values are also called tracking estimates or ex post savings (although ex post usually applies to Evaluated Savings). As

¹ Definitions are derived, in part, from the Regional EM&V Forum’s “Glossary of Terms, 2.1.” Additional terms and definitions may be found at

http://neep.org/uploads/EMV%20Forum/EMV%20Products/EMV_Glossary_Version_2.1.pdf

with Projected Savings Estimates, these claimed savings may utilize results of prior evaluations and/or values in Technical Reference Manuals. Claimed savings are adjusted from Projected Savings estimates by correcting for any known data errors and actual installation rates. Claimed Savings may also be adjusted with revised values for factors such as per-unit savings, operating hours, and savings persistence rates. Claimed savings can be indicated as first year, Annual Demand Savings, or Annual Energy Savings, Lifetime Energy Savings, Lifetime Demand Savings, Gross Savings, and/or Net Savings.

Demand Response: The reduction of customer energy usage at times of peak usage in order to help system reliability, to reflect market conditions and pricing, or to support infrastructure optimization or deferral of additional infrastructure. Demand response programs may include contractually obligated or voluntary curtailment, direct load control, and pricing strategies.

Deemed Savings: An estimate of Energy Savings or demand savings for a single unit of an installed energy efficiency measure that (a) has been developed from data sources and analytical methods that are widely considered acceptable for the measure and purpose, and (b) is applicable to the situation being evaluated. Individual parameters or calculation methods can also be deemed.

Discount rate: The interest rate reflecting the time value of money that is used to convert cash flows occurring at different times to a common time (e.g., to convert future values to present values and vice versa). It is used to determine the present value of future energy savings.

Evaluation, Measurement and Verification (EM&V): EM&V refers to the process of formally assessing the success, effectiveness, cost-effectiveness, and accuracy of all measure, program and/or portfolio impacts and activities. Evaluation typically refers to formal assessments of savings impacts, process efficiency, participation satisfaction and motivations, and assessments of net-to-gross adjustments to account for free-riders, spillover and market effects. Measurement and verification generally refers to assessing the accuracy of data, tracking systems, measure and customer counts, and the appropriate application of agreed upon savings or other factors and assumptions

Energy Efficiency (EE): The use of less energy to provide the same or an improved level of service to the energy consumer; or the use of less energy to perform the same function.

Energy Efficiency Resource Standards (EERS): The EERS Act of 2009 establishes statewide energy efficiency resource standards for electric and natural gas utilities in Delaware.

Energy Efficiency Savings: The level of reduced energy use (or savings) resulting from the installation of an energy efficiency measure or the adoption of an energy efficiency practice, subject to the condition that the level of service after the investment is made is comparable to the baseline level of service.

Evaluated Savings: Savings estimates reported by an independent, third-party evaluator after an impact evaluation has been completed. These savings are also called ex post or ex post evaluated savings. Evaluated Savings differ from Claimed Savings in that the savings are subject to an analysis and/or verification by an evaluator. Factors such as installation rates from Claimed Savings and per-unit savings values and operating hours from Technical Reference Manuals

may be used for Evaluated Savings. However, these factors may also be modified from Claimed Savings, as a result of Evaluation and/or Verification activities, with adjustments for data errors, per-unit savings values, operating hours, installation rates, savings persistence rates, or other considerations. Types of Evaluated Savings include: first year, Gross Savings, Net Savings, Annual Demand Savings, Annual Energy Savings, Lifetime Energy Savings, and Lifetime Demand Savings.

Ex Ante Savings Estimate: Forecasted savings used for program and portfolio planning purposes (From the Latin for “beforehand”).

Ex Post Evaluation Estimated Savings: Savings estimates reported by an evaluator after the energy impact evaluation has been completed (From the Latin for “from something done afterward”).

Field Measurement and Verification: The process for quantifying the savings delivered by an energy efficiency program or measure. Measurement and Verification (M&V) demonstrates how much energy the program or measure has saved. Various protocols for Measurement and Verification exist, including the International Performance Measurement and Verification Protocol (IPMVP), which defines common terminology and the key steps in implementing a robust M&V process.

Free riders: Program participants who would have installed EE measures anyway, even without the EE program.

GHG (Greenhouse Gas Emissions): A greenhouse gas is a gas that contributes to the greenhouse effect by absorbing infrared radiation, e.g., carbon dioxide.

Gross Savings (Gross Energy Impact): The change in energy consumption and/or demand that results directly from program-related actions taken by participants in a program, regardless of why they participated and unadjusted by any factors (e.g., Free Riders).

Incremental Costs: The additional cost of purchasing and installing a more efficient measure. Calculated as the price differential between the energy-efficient equipment or service and the standard or baseline equipment or service.

Kilowatt (kW): Measure of 1,000 watts of electrical power.

kilowatt-Hour (kWh): The amount of electric power consumed/generated over a period of one hour. For example, a 100 Watt light globe left on for 10 hours would consume 1 kWh, that is, 100 Watts x 10 hours = 1,000 Watt hours = 1 kWh.

Levelized Cost: Represents the present value of the total cost of a project/measure over an assumed financial life, converted to equal annual payments and expressed in terms of real dollars to remove the impact of inflation.²

Lifetime Demand Savings: The expected demand savings over the lifetime of an installed measure(s), project(s), or program(s). May be calculated by multiplying the annual peak demand

² Derived from the U.S. Energy Information Administration.

reduction associated with a subject measure(s) by the Expected Useful Lifetime (EUL) of the measure(s). May include consideration of technical degradation and possibly Take Back. Can be gross or net savings. For electricity, it is expressed in units of kW-years.

Lifetime Energy Savings: The expected energy savings over the lifetime of an installed measure(s), project(s), or program(s). May be calculated by multiplying the annual energy usage reduction associated with a subject measure(s) by the EUL of the subject measure(s). May include consideration of technical degradation and possibly Take Back. Can be gross or net savings.

Market Effect: The change in the structure or functioning of a market, or the behavior of participants in a market, that results from one or more program efforts. Typically, the resultant market or behavior change leads to an increase in the adoption of energy -efficient products, services, or practices.

Measure: Equipment or improvements installed through the participation in an energy efficiency or demand response program.

Non-Energy Benefits (NEBs): Benefits associated with EE measures in addition to energy savings, such as improved comfort, productivity, health, safety, convenience, and aesthetics.

Net Savings: = (Gross Savings) – (savings attributable to Free Riders) + (savings attributable to Spillover) + (savings attributable to Market Effects). In other words, the energy savings that are attributable to a program’s intervention in the market, exclusive of other reasons for changes in energy use. Evaluations can use approaches that produce gross savings that are then adjusted for net. Net savings can also be calculated directly without Free Ridership adjustments by using experimental design evaluations, quasi-experimental design evaluations, or by setting the energy impact baselines to include Free Ridership considerations, such as when the baseline is set at market standard practice.

Net Present Value: The value of a stream of cash flows converted to a single sum in a specific year, usually the first year of the analysis. It can also be thought of as the equivalent worth of all cash flows relative to a base point called the “present.”

Net-to-Gross Ratio (NTG): A factor or ratio representing Net Savings divided by Gross Savings.

Precision: The indication of the closeness of agreement among repeated measurements of the same physical quantity. It is also used to represent the degree to which an estimated result in social science (e.g. energy savings) would be replicated with repeated studies.

PJM: A regional transmission organization that manages the high-voltage electric grid and the wholesale electricity market that serves all or parts of 13 states (all of Delaware) and the District of Columbia.³

Primary Evaluation: Activities undertaken by the Program Administrators in developing, implementing, or conducting EM&V for EE and Demand Response programs. It includes both

³ From www.pjm.com

impact and process evaluation and is completed by a third party EM&V contractor hired by the Program Administrator.

Program Administrator: The entity responsible for the funding, development, oversight, and often implementation of an EE program or portfolio. This entity may be an Affected Energy Provider or a third-party that administers programs on behalf of the state or utility(s), such as the Sustainable Energy Utility.

Program Implementer: An entity hired by the Program Administrator to plan, implement, and deliver EE programs on their behalf.

Projected Savings: Forecasted savings used for program and portfolio planning purposes and reported by a Program Implementer or Program Administrator prior to the time the subject EE activities are completed. Projected savings are based on prior evaluations, Technical Reference Manuals, and/or pre-program or portfolio estimates of factors such as per-unit savings values, operating hours, installation rates, and savings persistence rates. Projected savings can be indicated as first year, Annual Demand Savings, Annual Energy savings, Lifetime Energy Savings, Lifetime Demand Savings, Gross Savings, and/or Net Savings. Projected Savings may also be referred to as planning estimates or ex ante estimates.

Realization Rate: The term is used in several contexts for comparing one savings estimate with another. The primary and most meaningful application is the ratio of Evaluated Gross Savings to Claimed Gross Savings (versus comparing Net and Gross Savings estimates which is best defined with a Net-to-Gross Ratio). Basis for the ratio not being 1.0 can include several considerations such as the following: 1) adjustments for data errors, 2) differences in implemented measure counts as a result of Verification activities, and/or 3) other differences revealed through the evaluation process, such as with respect to baseline assumptions.

Reliable Pricing Model (RPM): PJM's capacity market model, based on making capacity commitments three years ahead, designed to create long-term price signals to attract needed investments in reliability in the PJM region.⁴

Rigor: The level of effort expended to minimize uncertainty due to factors such as sampling error and bias. The higher the level of rigor, the more confident one is that the results of the evaluation are both accurate and precise.

Spillover ("free drivers"): EE measures that are not incented or installed by a program, but are taken as a result of the program's influence on customers. There two general types of spillover: (1) participant spillover, in which non-incented or non-installed actions are taken by participants; or (2) non-participant spillover (often called market effects) in which actions are taken by non-participants due to the general influence or awareness-raising effects of the program.

Take Back Effect: Also called Rebound or Snap Back. A change in energy-using behavior that yields an increased level of service that is accompanied by an increase in energy use and occurs

⁴ From www.pjm.com

as a result of taking an energy efficiency action. The impact of this effect is that the savings associated with the direct energy efficiency action is reduced by the resulting behavioral change.

Therm: A unit of heat equivalent to 100,000 British thermal units (Btus). Used by natural gas companies to determine a customer's natural gas usage.

Technical Reference Manual (TRM): An operating manual that describes the standardized approaches to be used for estimating savings from the installation of energy efficiency measures. Provides a common comparable approach for estimating energy savings across programs and market sectors for the measures typically installed via the energy efficiency programs.

Total Resource Cost (TRC) Test: The Total Resource Cost test compares the costs and benefits of Program Administrator programs and/or portfolios as a resource option that accrues to Delaware ratepayers and Delaware energy systems. Costs include all real costs to Delaware, including the full costs of delivering and evaluating the programs (the Program Administrator costs), plus any participant contribution toward incremental efficiency installation costs. Benefits include avoided energy costs, other avoided resource costs, reductions in O&M costs, benefits from any market price reductions of energy attributable to the program/portfolio, and quantifiable non-energy benefits. The test is expressed as the ratio of the discounted total present value benefits of the program to the discounted total present value costs over the entire life of the stream of benefits and costs that accrue from the program/portfolio. A benefit-cost ratio above one indicates that energy efficiency is cheaper than alternative energy supply.

Verification: An independent assessment of an energy efficiency or demand response program that confirms: (1) the installation rate of measures installed through the programs; (2) that the installation meets reasonable quality standards, and (3) the measures are operating correctly and have the potential to generate the predicted savings. Verification may include one time or multiple activities over the Estimated Useful Life of the measures.

1. INTRODUCTION

Evaluation, measurement, and verification (EM&V) is a vital tool in creating consensus around the impact of current and future investments to reduce energy use and peak demand in Delaware. Results from EM&V are critical to the assessment of progress in meeting Delaware's energy efficiency and peak demand targets outlined in the Energy Efficiency Resource Standards Act, the State's Executive Order 18 (its "lead by example" policy), and the Sustainable Energy Utility's legislated goals. The results from EM&V provide valuable feedback to improve programs during implementation, inform the development of new programs, and guide the allocation of resources. Furthermore, investments in EM&V have been proven to increase program efficiency and cost-effectiveness, resulting in cost savings that well exceed any EM&V costs.

This document establishes the Delaware Evaluation, Measurement, and Verification Framework (EM&V Framework). The purpose of this EM&V Framework is to

- Develop an overall approach to the evaluation of energy efficiency and demand response programs in Delaware
- Standardize evaluation approaches for the assessment of energy efficiency and demand response programs
- Provide specific guidance to Program Administrators for the evaluation of energy efficiency and demand response programs
- Ensure consistency between Program Administrators' energy efficiency evaluations plans, analysis, and reporting efforts
- Provide general guidelines and principles related to cost recovery and performance incentives

This document is an updated version of an earlier draft framework prepared by Opinion Dynamics Corp. That document was developed in coordination with the EM&V Stakeholder Group, established by the Department of Natural Resources and Environmental Control (DNREC). This Framework also recognizes that Delaware has been closely involved in Northeast Energy Efficiency Partnership's (NEEP) Regional Evaluation, Measurement, and Verification Forum (EM&V Forum). To the extent possible, the Framework will use the EM&V Forum's products such as *Regional EM&V Methods and Savings Assumptions Guidelines* and the *Delaware Technical Reference Manual*.⁵

The establishment of this Framework provides:

- A consistent approach and protocols to measure, verify, and report Energy Efficiency (EE) Savings and Demand Response (DR) savings in order to assess Demand Side Management (DSM) as a resource on a comparable basis as other energy sources

⁵ Adapted from the Mid Atlantic Technical Reference Manual

Draft Delaware Evaluation Framework

- The basis for the EM&V procedures to be promulgated in EERS regulations pursuant to Del. Code Title 26, Section 1504
- Identification of the overall structure of EM&V administration and the roles and responsibilities for each entity involved in the evaluation process
- Expectations of the evaluation effort so that stakeholders and consumers understand the evaluation efforts and processes/methodologies
- Consistent approaches to net-to-gross (NTG) ratio, baselines, measurement and verification (M&V), level of rigor, and attribution so that all evaluation activities can be compared
- Identification of key EM&V resource documents and an explanation of how the documents are interconnected
- Identification of the types of evaluation efforts expected (process, impact/effects, market effects, etc)
- Identification of cost-effectiveness rules
- The timing of evaluation efforts and processes including planning, implementation, reporting, cross-cutting studies, and up-dating

2. KEY EM&V RESOURCE DOCUMENTS

Five key EM&V resource documents provide the technical basis for EM&V in Delaware:

- **EM&V Framework** – This document provides the overall structure and guidelines for EM&V in Delaware. It also details how the technical policies and procedures contained in the documents below interrelate. The guidance in the EM&V Framework will have precedence over guidelines or direction provided in supporting documents including those listed below.
- **Delaware Technical Reference Manual (TRM)** – This document provides the deemed savings and algorithms that should be used for program measures in Delaware. The Delaware TRM is based on the Mid Atlantic TRM and provides updates to key measures that are specific to Delaware programs or that have been updated to reflect Delaware weather conditions. All per-measure projected savings assumptions for Delaware should be based on the TRM, provided in Appendix B.⁶
- **Methodologies** – The Methodologies document is currently comprised of two documents – the *Regional EM&V Methods and Savings Assumptions Guidelines* and the Delaware Addendum to that document, provided in Appendix C. The purpose of the Methodologies document is to provide clarity, transparency, and a common understanding of EM&V methods that should be used for many of the common program measure/program types.
- **Industry Standard Protocols** – If the Methodologies document does not provide EM&V methods for proposed programs or measures, Program Administrators should follow industry standard protocols.
- **PJM Manuals** – For demand response programs that participate in the PJM RPM capacity market, Program Administrators should follow the requirements in PJM Manual 18B. Program Administrators may choose or be required to offer a portion of the expected eligible EE savings from their programs into the PJM RPM Base Residual Auctions (BRA) and/or RPM Incremental Auctions. For those programs, evaluation must be compliant with the guidelines and requirements outlined in this Framework, in addition to any requirements prescribed by PJM in manual 18B.

Figure: Illustration of the hierarchical relationship between the documents described above.

[to be added]

⁶ If proposed measures are not in the TRM, alternative assumptions can be used so long as the assumptions are subject to review and oversight by the Independent Evaluation Contractor. DNREC must also be notified so that the measure can be added to the TRM, if appropriate.

3. EEAC, DNREC, AND PROGRAM ADMINISTRATOR EM&V RESPONSIBILITIES

This EM&V Framework establishes a collaborative process by which the Program Administrators (PAs), the Energy Efficiency Advisory Council (EEAC), and Department of Natural Resources and Environmental Control (DNREC) administer and oversee EM&V for PA energy efficiency portfolios in Delaware. In this framework all of the parties will work together to plan, implement and review evaluations, including impact, process, market assessments, cost-effectiveness analysis, and baseline research. The following entities shall have responsibilities for EM&V.

- **EM&V Collaborative** - Consists of representatives of the Program Administrators and the EEAC Consultants. The Collaborative will jointly issue an RFP for one or more Independent Evaluation Contractors (IEC) to implement all evaluations.
- **DNREC** - DNREC will hire a team of professional evaluation experts (EEAC Consultant) who will report to DNREC staff to assist with the oversight of EM&V activities in Delaware. DNREC's Oversight responsibilities related to acquiring EM&V services include: 1) competitively acquiring EEAC Consultant services, and 2) establishing, managing and overseeing EEAC Consultant service acquisition process and the day-to-day management responsibilities required to successfully implement the EEAC Consultant's efforts
- **EEAC Consultants** - The EEAC Consultants will be retained by DNREC to oversee the planning and implementation of all EM&V activities in Delaware. They will review and approve energy efficiency and demand reduction program evaluation contractors (Independent Evaluation Contractor) conducting evaluation studies for the Collaborative
- **PA Representatives** - Each PA will designate a representative.
- **Independent Evaluation Contractor(s)**- The Independent Evaluation Contractor or Contractors (IEC) will be selected by competitive bid to conduct all evaluation studies done in Delaware.⁷ The collaborative team of PAs and the EEAC Consultant will select one or more IEC firms. The IECs will enter into contract with each of the PAs to conduct all research approved by the collaborative. Each PA will contribute a share of the IEC's costs for administration and overall planning proportional to the PA's overall EE budget. Budgets for individual studies would be allocated to only those PAs with a stake in the results.

The Department of Natural Resources and Environmental Control (DNREC) with the assistance of the EEAC Consultants will assume an oversight role for the EM&V activities of the Program Administrators to ensure the objectivity and independence of those activities, and the perception of such, and to help ensure consistency, timeliness, and credibility. While PAs and

⁷ The Collaborative may decide to hire one IEC to cover all evaluation services or it may decide to hire separate IECs to cover different sectors or evaluation functions.

EEAC Consultants (acting on behalf of the DNREC) will work diligently to reach a consensus on evaluation issues, where there are areas of difference that may arise that cannot be resolved through consensus during the on-going interactive process between the EEAC Consultant and the PA evaluation staff, authority for decision-making will reside with the EEAC Consultant.

To enable the Program Administrators to fulfill their responsibility to report program savings to the PSC with full confidence, an appeals process shall be established, through which the PAs may bring decisions made by the DNREC or its Designee for review and resolution. The PAs will present their appeal to an EM&V Committee consisting of three EEAC members, none of whom may be a PA representative. The Committee will review the issues related to the disputed matter, hear from the PA evaluation staff and EEAC Evaluation Consultant, and make a determination on the outcome of the matter. The decision will be recorded, along with a description of the applicable issues. The participants in the appeal will sign the record of the decision, indicating their acceptance of the representation of the issues and of the decision. In exceptional cases, where the PAs perceive there to be significant risk to their ability to manage the energy efficiency programs in the near term, the PAs will note their disagreement with the decision of the EM&V Committee on the record of the decision and reserve the right to immediately petition the PSC on the EM&V Committee's decision. The PAs shall be able to submit any such documents to the PSC in conjunction with the filing of the Energy Efficiency Plans and Annual Reports. The PSC will be able to review the record of this decision in its review of Plans and Annual Reports.

4. EVALUATION FRAMEWORK AND GUIDELINES

EEAC AND DNREC OVERSIGHT RESPONSIBILITIES

Establishment of EM&V Timelines

The EEAC will establish timing for EM&V deliverables based on length of program cycles in Delaware. The timing for updating the Framework, TRM, and Methodologies will be established so that the update process aligns with the Delaware program cycle. Updates will occur so that there is ample time to address how those changes affect programs in advance of the next program planning cycle.

Acquisition of Oversight EM&V Services

The DNREC will select and contract with the EEAC Consultants.

EM&V Plan and Budget Approval for Primary EM&V

The EEAC will approve all EM&V three-year plans and budgets. The EEAC will also approve annual plans and budgets for each PA portfolio of programs.

At the program level, the EEAC Consultants will work collaboratively with the PAs to review and approve of EM&V plans and budgets developed by the IEC. Plans and budgets will initially be developed for every new program developed by a Program Administrator.

PA RESPONSIBILITIES

Program Administrators are responsible for the direct development and implementation of all EM&V activities required for their energy efficiency portfolio in adherence with this Framework, and for ensuring efforts are consistent with the policies, procedures, approaches and timelines that meet Delaware's needs, and in compliance with the promulgated EM&V regulations.

Administer Contract with Independent Evaluation Contractor

The PAs will establish contracts with IECs. Those contracts must establish the independence of IECs, reference the oversight role of DNREC and the EEAC Consultants, and that work being done will be exclusively for the Collaborative.

Keep Collaborative Informed on New Programs or Changes to Existing Programs

The PAs will inform the Collaborative of new programs, including pilots, and of major changes to existing programs and pilots at least 3 months prior to their implementation, so that the Collaborative can develop EM&V plans. The Collaborative may allow flexibility to institute program changes on an expedited timeframe, at the request of PAs, when there is an urgent need to respond to market changes or for budget management reasons.

Track and Provide Necessary Data for Programs

Each PA must ensure that data is supplied to IECs as needed. The PAs must ensure that their program third-party implementers also track necessary data. All parties must take all possible measures to protect data security.

In addition to the detail outlined above, Program Administrators are responsible for submitting an EM&V report to EEAC and DNREC highlighting findings from the past program year. The report will be submitted by April 30 of the following year and include the following information.

- An account of EM&V activities completed in a manner that is consistent with the guidelines outlined in this Framework, with established EM&V Methodologies developed for the state of Delaware, and consistent with approved EM&V Plans approved by the Collaborative
- Impact and Process evaluation findings, as appropriate by program, showing actual performance against program goals
- Estimates of *ex-post* evaluated cost-effectiveness results by program and for the portfolio as a whole, performed and calculated in a manner consistent with this Framework and EM&V regulations

The PAs are also responsible for providing quarterly progress reports that include updates on progress towards EM&V goals and expenditures, and participating in update meetings as requested by EEAC or DNREC.

Forward Capacity Market Participation

Program Administrators are expected to offer their eligible program resources into the PJM forward capacity market (Reliability Pricing Model) so long as it is cost effective and the evaluation of such resources remains compliant with this Framework. Results of the cost effectiveness assessment (both those that show a positive benefit for program participation and those that show a negative benefit for participation) should be included in the program plans provided to the EEAC.

COLLABORATIVE TEAM RESPONSIBILITIES

Primary evaluation, or the responsibility for acquiring and managing program evaluation services, rests with the Collaborative team. Primary evaluation is used for assessing and improving the performance of energy efficiency and demand reduction programs offered in Delaware. EM&V will be conducted by IECs who operate at an arms-length from the Program Administrators and have no real or apparent financial or operational conflicts of interest with the programs implemented or the Program Administrators, who design, manage, offer or implement those services to Delaware customers. The IECs will not be allowed to have any other contractual relationship with any of the Program Administrators in Delaware.

Select Independent Evaluation Contractor(s)

The collaborative team will issue an RFP and select one or more IEC teams to conduct all evaluation work.

Hold Periodic Meetings to Discuss Plans, Work Products, and Reports and to Review Progress

The collaborative team will establish a schedule for meetings to discuss progress of on-going work and to plan new research. The collaborative may establish subcommittees as needed to handle details best suited for smaller groups or matters that affect a sub-set of all PAs. The EEAC Consultant will post finished reports on the EEAC webpage.

Approve All Plans, Work Products, and Reports

All plans, work products, and reports must be approved by the Collaborative. In the event that agreement cannot be reached, the EEAC Consultant will decide the matter. Program cycle primary EM&V plans, including full budgets, will be developed by the Collaborative for review of compliance with this Framework, the *Regional EM&V Methods and Savings Assumptions Guidelines* and the Delaware Methodologies Addendum. EM&V plans should clearly outline the approach for each program or portfolio including detailing level of expected rigor and reliability of results. It is recognized that there may be programs or measures included in programs that may benefit from alternative approaches to EM&V. The Collaborative can approve these alternative plans when appropriate. There will generally three types of plans developed

- **Three-Year Plan:** The Collaborative will develop a 3-year EM&V plan and budget. This plan will be submitted to the EEAC by Oct 1 in the year prior to the start of the new 3-year cycle.
- **Annual Portfolio Plans:** The Collaborative will develop a general plan and budget of EM&V plans to be conducted in the upcoming year. Annual EM&V plans will be submitted for review and approval 60 business days in advance of the launch of the program cycle to which the EM&V plan pertains.
- **Individual Study Plans:** The Collaborative will develop an EM&V plan and budget for each individual study to be conducted by the IEC.

There are circumstances where an EM&V plan may need to be revised within the program cycle. For example, early process evaluation feedback may indicate a need to change the program design, test additional (pilot) program approaches, address poor performance, or react to previously unknown market challenges. In these cases, the PAs or the EEAC Consultant can support submittal of amendments to the EM&V plans. Amendments should clearly outline the need for the change, the new approach, and how the findings will be used to improve program functions mid-cycle.

INDEPENDENT EVALUATION CONTRACTORS

Independent EM&V Contractor will have the responsibility for completing primary EM&V activity, including field visits, surveys, modeling, document review, data analysis, etc., on all programs included in the Program Administrators' program portfolio. The Collaborative will decide the appropriate level of evaluation activity for each program. The IEC will provide both process evaluation and impact evaluation and will result in IEC Reporting as outlined in the next section of this document.

In addition to the detail outlined above, IECs are responsible for the following activities as they relate to EM&V implementation:

- Develop EM&V plans and budget that are consistent with the guidelines outlined in this Framework and with established EM&V Methodologies developed for the state of Delaware.
- Provide all EM&V plans to the Collaborative for review and approval.
- Oversee the day-to-day evaluation service management responsibilities required to successfully implement the evaluation efforts.
- Provide EEAC and DNREC with updates on EM&V implementation activities as outlined in the reporting section below, noting any specific implementation issues and how those issues have been resolved.

Primary EM&V Reporting

EM&V reports will provide an assessment of EM&V activities completed in a manner that is consistent with the guidelines outlined in this Framework and with established EM&V Methodologies developed for the state of Delaware. Reports will be provided as determined by the Collaborative team. The final reporting timeline will be established so that it can efficiently and cost-effectively meet the needs of the PAs, EEAC and the PJM compliance cycle whenever possible⁸. Program cycle reporting will include both Impact and Process findings, as appropriate by program, and will be used to measure performance against program goals. Impact evaluations associated with this assessment will provide energy impact estimates for each year of the program's operations and for the program cycle in total. This reporting will allow the evaluation to document program-cycle impacts as well as annual impacts that support program planning and restructuring efforts to maintain high performing programs and portfolios.

Evaluation reports should contain, but are not limited to, the following:

- Cover
- Title Page
- Abstract
- Table of Contents
- Executive Summary (including impact findings and process recommendations)
- Introduction and Purpose of the Study
- Description of Programs Covered in Study
- Study Methodology
- Assessment of the Reliability of Study Findings
- Detailed Study Findings (impact and process evaluation)
- Recommendations for Program Changes
- For impact studies, *ex-post* cost-effectiveness

⁸ Programs participating in PJM are responsible for meeting PJM reporting requirements in addition to DNREC reporting requirements and should leverage activities between the two when possible.

The following information should be included in a table format or bullet list within both the Executive Summary of the draft and final evaluation reports as well as in the sections of the report in which those items are presented and discussed. The goal of this requirement is to allow efficient and rapid extraction of key results to better understand the study results.

Energy Impact

- Program and portfolio level first year annualized gross and net energy impacts
- Program and portfolio level gross and net lifecycle EUL energy impacts
- For electric programs, program and portfolio level gross and net coincident peak kW
- Program NTG ratios and estimated components (if known)

Process Evaluation

- Key findings from the process evaluation
- Summary of recommendations made by the evaluation team

Market Effects (if applicable)

- Timeline describing years covered by the reported effects
- Key findings from the market effects evaluation aligning with priorities identified by the Collaborative for EE programs in Delaware.
- Estimated annual and lifecycle net energy savings realized from market effects (per technology, technology class, or market sector as appropriate)
- Listing of technologies affected by market effects

Table 4.1- Summary of roles and responsibilities by activity and entity in the state of Delaware

Activities	What (Document)	Who (Roles & Responsibilities)	When (Timeline)
Primary EM&V by Independent Evaluation Contractors	EM&V Plans and budget	Submitted by IEC for Approval by Collaborative	Program Cycle
	Reports	Submitted by IEC for Approval by Collaborative	As Determined
Statewide Collaborative Efforts coordinated by DNREC and EEAC Consultants. Statewide, crosscutting activities including updates to guidance documents, market research and evaluation studies	Framework	Update and review process is guided by Collaborative with guidance from EEAC and DNREC.	As Needed
	TRM		
	Uniform Methods and Protocols		
	Market Effects Studies, Baseline Studies, Market Potential Studies, and other studies		
	Regional Partnerships	Proposed by DNREC with review and input from Collaborative and adopted by DNREC	
	Fixed Functional Costs Statewide, cross-cutting budget		

5. FORWARD CAPACITY MARKET PARTICIPATION

Program Administrators are expected to offer their eligible program resources into the PJM forward capacity market so long as the evaluation of such resources remains compliant with the guidelines and requirements outlined in this Framework, in addition to any requirements prescribed by PJM. Participation in PJM must be considered early on in the program planning process and must make economic sense. Program Administrators must ensure that the increased cost of EM&V and administration is positively offset by the value bidding provides. To limit additional administrative costs and duplicative efforts and requirements between the needs of Delaware and the PJM, DNREC will consider accepting EM&V plans and reports developed for PJM as deliverables under this Framework, wherever feasible and appropriate. Determination of feasibility and appropriateness will depend on whether any specific PJM requirements significantly diverge from the guidelines in this EM&V Framework, how critical those are deemed to be toward a full and comprehensive assessment of efficiency program performance, and the costs and benefits to undertake potentially duplicative EM&V efforts.

PJM earnings will be allocated to the appropriate Residential and Non-Residential Program Administrator class budgets. See Appendix C for more information on forward capacity market participation. Initial guidance to the Program Administrator is to allocate 50% of the expected PJM compliant Energy Efficiency resources and 75% of the Demand Response resources in the BRA and make appropriate adjustments in the RPM Incremental Auctions as the PJM compliant savings become more certain.

For those energy efficiency programs whose resources will be submitted into the auction process as part of the PJM forward capacity market, rigor and reliability must meet that which is specified in manual 18B (Energy Efficiency Measurement and Verification). For demand response resources in the PJM forward capacity market, evaluation rigor and reliability is defined in Appendixes A and B of manual 19.

For additional details on participation in the PJM Capacity Market, see Appendixes C and D.

EEAC and DNREC Responsibility – Forward Capacity Market Participation

- Review and approve results of the program cost effectiveness assessment for PJM participation provided by IECs and approved by EEAC Consultants and Program Administrators.
- Develop reporting timelines that efficiently and cost effectively meets the needs of the EEAC/DNREC and the PJM compliance cycle whenever possible.

Program Administrator Responsibility – Forward Capacity Market Participation

- Provide results of the program cost effectiveness assessment including both those that show a positive benefit for program participation in PJM and those that show a negative benefit for participation in PJM to the EEAC in the program plans.
- For programs bidding into PJM, execute evaluation approaches that meet the rigor and reliability requirements outlined in this Framework and by PJM.

6. EVALUATION BEST PRACTICE APPROACHES

All methodologies must be presented in the work plan submitted for each study. The Collaborative must approve the methodology before it is implemented. Energy Efficiency and Demand Response programs in Delaware will use state-of-the-art evaluation approaches. The approaches selected by the IEC will be independent approaches focused on achieving the highest level of findings reliability balanced with consideration of EM&V costs and other constraints, following the guidelines in section 7 and 8 (below) of this document, and within the evaluation budget approved for those studies. Where there is not specific guidance provided via this Framework, the Delaware TRM and Regional Methodologies Guidelines (or via the PJM Manual 18B for program bidding into the capacity market), it is expected that evaluation approach will comply with industry standard protocols.

Collaborative Responsibility – Evaluation and Best Practice Approaches

- Review and approve the impact and process evaluation approaches that are consistent with the need for reliable studies across the portfolio of programs. This includes reviewing the proposed evaluation approaches to ensure they meet the level of rigor and reliability needed and that they are consistent with industry best practices.

Independent Evaluation Contractor – Evaluation and Best Practice Approaches

- Develop impact and process evaluation approaches that are consistent with the need for reliable studies across the portfolio of programs efforts, balanced by available resources, following best practices outlined in Delaware specific protocols, or when not available, with industry standard protocols that are consistent with IPMVP.

7. EVALUATION BUDGETING AND BUDGET MANAGEMENT

The evaluation budget in Delaware is set at approximately 5% of the portfolio budget. The 5% will cover both Primary EM&V and statewide and cross-cutting studies. For any given program cycle, the evaluation budget can be somewhat less than or greater than 5% depending on the evaluation needs. The budget allocations should be flexible enough to support the need for special evaluation studies and projects needed to reliably estimate program and portfolio program-induced gross and net impacts and the portfolio's market change induced net impacts. The budget will support program-focused process evaluations and evaluation requirements that may come out of participation in the PJM market –when cost-effective. Evaluation budgets are set at “approximately” 5% so that they will be developed in a manner that provides the funding needed to deliver reports that provide actionable recommendations for program implementation or operational changes and so that they meet the expectations for rigor and reliability discussed below. It is understood that depending on the program mix and/or EM&V goals the final EM&V budget may be plus or minus 5% of the portfolio budget. Evaluation budgets must be focused to achieve the most reliable results for the most important energy efficiency and demand response supply efforts. Careful allocation of evaluation resources must be achieved to provide the greatest value for the evaluation dollar.

The Collaborative will consider the following when developing/approving the proposed Program EM&V approach and when budgeting for EM&V activities:

- The importance of the program's immediate and likely long term energy saving contribution to the portfolio. Programs that are expected to save more energy or have high demand reduction impacts should have evaluation approaches that are more rigorous than initiatives that are expected to save less energy.
- Programs that spend larger portions of the portfolio budget should have a level of evaluation rigor that matches the importance of the program's total financial investment.
- Measures that have a high risk around the accuracy of the savings should have a high level of evaluation rigor thus reducing the level of uncertainty around the energy saving estimates of that program and for the portfolio.
- Field measurement and verification efforts should focus on the components of the portfolio that have the greatest risk of lowering the reliability of the total impact estimates.
- Sampling approaches, sample-size targets, and confidence limits should provide the highest level of accuracy achievable balanced with the available resources. Large programs and programs that are important for reaching energy saving targets should have sampling approaches that reflect that importance. Low impact or smaller programs may have lower precision and confidence levels.

Cost of statewide collaborative/cross cutting activities associated with EM&V in Delaware (including but not limited to updating the Framework, TRM and Methodologies, baseline or potential studies, participation in the NEEP regional forums, etc.) will be allocated among all participating program administrators in Delaware based on the total program or portfolio budget contributions.

DNREC Responsibility – Evaluation Budget and Management

- Review and approve Collaborative’s proposed EM&V budgets and allocations between process, market effects, and impact studies, ensuring budget allocations provide appropriate rigor and reflect the need for reliable impact evaluations and process evaluations that help improve the program and portfolio performance over time.
- Monitor Program Administrator EM&V budgeting and management.
- Manage and monitor EEAC Consultant budget spending streams.

Collaborative Responsibility – Evaluation Budget and Management

- Allocate budgets to cover process, market effects, and impact studies ensuring budget allocations provide for the appropriate level of rigor and reflect the need for reliable impact evaluations and process evaluations that help improve the program and portfolio performance over time.
- Identify and determine funding levels for special statewide studies that help understand statewide energy efficiency and demand response potentials, or identify program service gaps or barrier reduction needs across the state including annually updating this Framework and the Delaware TRM and Methodologies documents.

Program Administrator Responsibility – Evaluation Budget and Management

- Manage and monitor IEC budget spending streams and report any program evaluation budget that appears to be over or under spending by more than 20% at the program level.
- Report evaluation spending by dollars spent and percent spent for each program-specific evaluation each month.
- Provide input to and support for any special statewide studies that help Delaware understand statewide energy efficiency and demand response potentials, or identify program service gaps or barrier reduction needs across the state.

8. RIGOR AND RELIABILITY

Delaware acknowledges that rigor and reliability are driven by the EM&V budget and that statistical precision often positively correlates with evaluation cost, and as sample size increases with statistical precision, and for each sample point that improves statistical precision, there is an added burden of evaluation cost. Despite increased rigor from capacity market rules, sample designs must remain efficient and optimized to achieve appropriate precision at a reasonable cost. Methodologies should match the standards and expectations outlined for rigor and reliability in the *Regional EM&V Methods and Savings Assumptions Guidelines* and the Delaware Addendum to that document.

In addition to the considerations for Rigor and Reliability outlined above in section 7, the Collaborative will also consider the type of program being evaluated and the ability to leverage previous or other evaluation efforts when developing EM&V plans. In essence, it is expected that:

- Test programs, programs that target new or emerging technologies, programs that are slow to launch, programs that are not enrolling the expected number of participants, or programs that have problems achieving their projected energy goals should be conducted using process and market study approaches that are more rigorous.
- Methodology selection will consider previous evaluations for that program and the degree of change that has occurred to programs and their design.
- Opportunities to leverage activities across Program Administrators to increase the level of rigor achieved for the budget should be explored when possible.

Collaborative Responsibility – Rigor and Reliability

- Ensure the level of rigor and reliability of IEC efforts reflects the need for accurate evaluation findings to support the regulatory and power supply planning needs of the state.
- Initiate and lead updates to the Framework's rigor and reliability requirements on an as-needed basis.

Independent Evaluation Contractor Responsibility – Rigor and Reliability

- Supervise evaluation as it is implemented to assure that the Framework's rigor and reliability requirements are followed.
- Provide advice and counsel to the Collaborative on rigor and reliability needs associated with the evaluation efforts.

9. STATEWIDE COLLABORATIVE EFFORTS: CROSS CUTTING EVALUATION STUDIES

From time to time, it will be necessary to conduct collaborative cross cutting evaluation studies. Cross-cutting studies are used to support the portfolio or program design, development and approval process, or to support the evaluation analysis efforts. By coordinating these efforts statewide, cross cutting studies benefit all ratepayers by adding value to all Delaware Program Administrators' potential programs. These collaborative efforts minimize redundant independent efforts and reduce costs.

The Collaborative will identify cross cutting needs during the program cycle planning and budgeting process. The Collaborative will work with stakeholders to identify near-term and long-term cross cutting needs. As the cross cutting evaluation related studies and special projects are identified and approved for implementation, the cost of these studies will require joint funding that will require contributions from the Program Administrators and all affected energy providers. Any joint funding will be allocated based on proportional shares of relevant program or portfolio budgets.

Examples of the types of cross cutting evaluation studies include, but are not limited to:

- Market effects studies to document energy savings statewide that are caused by the portfolio of programs offered in the state.
- Statewide potentials studies to document the level of savings that can be achieved within Delaware under different cost, supply, and energy service initiatives.
- Gap analysis of technology or service gaps that can be met by energy efficiency or demand response programs that save energy or demand.
- Analysis of barriers to energy efficiency implementation and development of approaches to overcome those barriers through redesigned programs or policy initiatives.
- Meta-analysis studies that look at the energy efficiency and demand response evaluation efforts as a whole and assess accomplishments and identify opportunities at the state level.
- Statewide measurement studies conforming to PJM forward capacity market requirements that could be used by all parties interested in participating in those markets.
- Management and updating of this Framework, the TRM, and methodologies documents developed for the state.
- Evaluations of consistent programs branded and delivered by multiple Program Administrators
- Evaluations of joint electric and gas programs delivered jointly or in collaboration by both an electric and a gas program administrator.
- Other efforts as identified by the EEAC, DNREC, or the Collaborative.

Cross cutting evaluations and evaluation-related studies shall be directed by the Collaborative and shall leverage activities of other related entities such as NEEP to the extent possible to both reduce costs, expand reach and remain consistent, where appropriate, with other regional efforts. Contracting for these efforts will be established via contracting agreements managed by DNREC. Additional collaborative statewide efforts include the management and updating of this Framework, the TRM and methodologies documents developed for the state. This process is outlined in greater detail in Section 13 Update Approach.

Collaborative Responsibility – Cross-Cutting and Coordination

- Identify cross-cutting study needs, and undertake planning activities required to conduct studies.
- Set up and operate a structure for procuring, implementing, managing, monitoring, and paying for the cross-cutting studies.
- Provide oversight for all cross-cutting activity, assuring studies are conducted within the budgets allocated and that the researchable issues are appropriate for the needs in Delaware.
- Monitor progress of the cross-cutting studies.

Independent Evaluation Contractor Responsibility – Cross-Cutting and Coordination

- Identify cross-cutting needs in coordination with Collaborative.
- Implement studies as directed by Collaborative
- Report study progress to Collaborative following the reporting guidelines outlined in the Administration section of this Framework.

Program Administrator Responsibility – Cross-Cutting and Coordination

- Incorporate research results into future planning activities.
- Contractually share management of IEC work on cross-cutting studies.

10. APPLICATION OF SAVINGS

Programs in Delaware will be evaluated based on Ex-Post (verified Net)⁹ goal achievement.

Gross savings will be established by the best available method as determined by the Collaborative. This could be billing analysis, engineering analysis, or deemed savings estimates in the TRM. Gross savings do not account for the effects of free riders, spill over or market effects on the total program savings. For deemed savings, ex-post goal achievement will be the savings as verified by the IEC and may reflect installation rate, quantity and M&V adjustments that result from the Primary EM&V. Billing analysis and metering studies may be used to adjust deemed savings estimates, prospectively only, and incorporated into the TRM. Custom projects will require engineering or other evaluation estimates that will be applied retroactively.

Programs in Delaware are provided under an “*equity-of-service*”¹⁰ platform, meaning that programs cannot be limited to select groups of people or customers with different attitudes or opinions about energy use or energy savings. Thus, all programs are expected to have free riders. Free riders are participants who take advantage of a program, but who would have done exactly the same thing without the benefits of the program. Program Administrators are not free to offer programs to only customers that they think might not take an action without the program’s incentives; however, programs should be developed and promoted with an eye toward minimizing free ridership. Because free riders are expected to take part in Delaware programs, a Net-to-Gross analysis will be completed for all programs in which free riders are expected, unless the evaluation approaches use experimental or quasi-experimental designs or set energy impact baseline conditions at standard market practice levels that lead directly to the estimation of net savings.

Net savings, those savings that are caused by the program’s intervention in the market and that account for free riders, participant spillover and market effects, will be used to adjust verified gross savings estimates for purposes of assessing goal achievements and to provide program design and marketing guidance that can support planning for upcoming program years. Net assessment may also be used by EEAC, DNREC, and other policy makers to assess when a program should be redesigned or terminated as a part of the Delaware portfolio.

The Collaborative will determine NTG ratios to be applied to each program prospectively each year. These NTG ratios can be derived from specific research or from other best available information. The collaborative, in consultation with the IEC, will agree on NTG values to use going forward, informed by evaluations and all other best available information. The Collaborative should reach consensus on values, however, if it cannot, then the decision will be made by the EEAC Consultants. Estimated net assumptions will be included with the analysis

⁹ Verified Net (Ex-Post) goal achievement = Gross goals as verified by the IEC and approved by the Collaborative*NTG ratio. Gross calculated after the programs have concluded and EM&V has been completed.

¹⁰ Equity of service means that programs cannot exclude select groups of ratepayers (who are paying into the program) because of their different attitudes or opinions about energy use or energy savings (i.e. they would have acted in absence the program).

and will be submitted to EEAC as part of the program plan review process. Table 10.1 summarizes use of net and gross savings in Delaware.

Table 10.1: Summary of Net versus Gross Application

	Goals	Assessment of program plan achievement	Informing planning	Benefit-cost Analysis	Informing future program goals	EM&V Reporting
Verified			Y		Y	Y
Net	Y	Y	Y	Y ¹¹	Y	Y

RETROACTIVE VS. PROSPECTIVE SAVINGS CALCULATION

While goal achievement will be assessed based on net savings, a component of this will be the verified gross savings (ex post). However, changes in deemed energy savings or other deemed assumptions that result from the program evaluation will not be applied retrospectively, but will be applied to the program and portfolio prospectively to the next program cycle. Evaluation results that change deemed savings assumptions will not be applied retrospectively to true-up achieved energy savings but instead will be used to plan future programs and services and to inform updates to the Delaware TRM. Changes to gross deemed savings assumptions will be coordinated through the annual process of updating the TRM and/or in coordination with updates to the Mid-Atlantic TRM.

Transmission and Distribution Losses

Energy savings will be calculated at the customer level. Accounting for any increase in net savings attributable to avoided transmission and distribution system losses shall be the responsibility of the Program Administrator. All T&D loss factors applied to represent generation level savings will use estimates of marginal system line losses, and not average loss factors.

Collaborative Activity – Savings Calculation

- Review and approve portfolio savings analyses completed by IECs on energy efficiency portfolios and programs.
- Coordinate with the DNREC to provide updates to the TRM and Uniform Methods so that savings used in Delaware reflect the most recent information available, including information gathered through program EM&V completed in Delaware.
- Review and approve Program Administrator assumptions regarding savings attributable to avoided transmission and distribution system losses.
- Reach consensus on all forward looking NTG ratios to apply to the following year.

¹¹ Net Saving will be used in the benefit costs analysis for all purposes

- Provide to EEAC for review and approval as part of the annual planning cycle.

Program Administrator Responsibility – Savings Calculation

- Provide portfolio level benefit-cost analysis on energy efficiency portfolios and programs, if not performed by the IEC.
- Coordinate with the DNREC and Collaborative to provide advice on benefit-cost metrics, metric values, and calculation approaches.
- Account for any increase in net savings attributable to avoided transmission and distribution system losses.

Independent Evaluation Consultant Responsibility – Savings Calculation

- Provide Collaborative with EM&V reports that include evaluated gross and net savings for each program.
- Provide written savings assumptions to Collaborative for any measure not included in the TRM or covered under the Methodologies established for Delaware.
- Recommend to the Collaborative any proposed prospective modifications to the TRM, or other deemed assumptions.
- Advise the Collaborative, as requested, on issues related to reaching consensus on NTG ratios for prospective deeming.

11. BENEFIT-COST ANALYSIS

Energy Efficiency portfolios in Delaware must meet the benefit-cost ratio outlined in this Framework. Target cost-effectiveness level is set at the portfolio level; individual program cost-effectiveness will be provided to EEAC for review as well. Portfolios should be developed to maximize long term cost-effectiveness and consider investing in the activity and resources needed to establish the groundwork for programs in the future.

SELECTED TESTS

Cost-effectiveness analysis of Delaware's energy efficiency and demand response programs will be conducted using one primary test at the portfolio level. In addition to the portfolio level cost-effectiveness analyses for the primary test, Program Administrators must also apply the primary test to each program within the program portfolio. The Framework outlines the general features of the Total Resource Cost Test (TRC). The TRC will be applied to calculate the net-present value of all costs and savings, using the full effective useful life of the measures installed.

TOTAL RESOURCE COST TEST, PRIMARY COST-EFFECTIVENESS TEST.

The TRC measures the net costs of Program Administrator programs as a resource option based on the total costs of the program, including both the participants' costs and the Program Administrator costs. The test is expressed as the ratio of the discounted total benefits of the program to the discounted total costs over some specified time period. It gives an indication of the rate of return of this program to the Program Administrator and the ratepayers. A benefit cost ratio above one indicates that energy efficiency is cheaper than alternative energy supply (the levelized cost of energy efficiency compared to other electricity supply options is cheaper than traditional supply).

The primary purpose of this test is to compare the cost of energy efficiency against the cost of energy production and transportation regardless of who pays. The TRC seeks to include customer and utility costs for energy efficiency as well as the benefits, not just to the utility and its ratepayers, but to other constituents as well. It represents the combination of the effects of a program on both the customers participating and those not participating in a program. The benefits calculated in the TRC include the electric avoided supply costs, the reduction in transmission, distribution, generation, and capacity costs valued at marginal cost for the periods when there is a load reduction, and gas avoided supply and delivery costs. The avoided supply costs should be calculated using net program savings, net of changes in energy use that would have happened in the absence of the program. Other benefits can include lower prices for electric and gas energy and capacity in wholesale markets resulting from reductions in the quantity of energy and capacity that customers will need in the future due to efficiency and/or demand response programs. Lower demand for energy and capacity means that the wholesale markets do not need to purchase the next most expensive unit. This impact of efficiency programs on market prices is referred to as the Demand-Reduction-Induced Price Effect (DRIPE), and should be included where quantifiable. Non-primary fuel benefits are also

included in this test. For example, insulation and air sealing measures not only save on electric air conditioning costs in the summer months, but also save the customer money on heating fuels such as natural gas, oil, wood, propane, and other sources. Finally, reasonably quantifiable other benefits to the utility system and ratepayers should be included. These non-energy benefits (NEBS) can be directly estimated, or an agreed upon adder to avoided costs may be adopted as a proxy for typical NEBS. Any adders may differentiate by customer class, program or market. The costs in this test are the program costs paid by both the Program Administrator and the participants. Thus all equipment costs, installation, operation and maintenance, cost of removal (less salvage value), and administration costs, no matter who pays for them, are included in this test. Any federal¹² tax credits are considered a reduction to costs in this test.¹³

Total Resource Cost Test = (Energy and Capacity Avoided Costs -Benefits + Non Energy Benefits +DRIPE) / (Program Costs + Net Participant Costs + Non Energy Costs)

Where benefits and costs (electricity and gas) include the following.

Benefits-Energy and Capacity (to all ratepayers)

- Reduced energy and capacity requirements (benefit is achieved either through load reduction or capacity payments)
- Reduced congestion charges
- Reduced SRECs and RECs requirements¹⁴
- Avoided transmission and distribution cost investments
- Anticipated reductions in environmental compliance costs

Benefits-DRIPE (to all ratepayers)

- Reductions in electric and gas marginal energy and capacity costs by reduced demand often referred to as the Demand-Reduction-Induced Price Effect (DRIPE)

Benefits-NEBS (to participants)

- Quantifiable non-energy benefits accruing from program participation (or deemed adder to represent average NEBS)

Costs

- Energy efficiency and demand reduction program administration costs, including all program implementation and administration costs, EM&V costs including EM&V oversight costs.
- Incremental Measure costs (both program portion and participant contribution).

¹² State taxes should not be included as they are essentially a transfer payment since DE taxpayers equal DE ratepayers.

¹³ PJM Capacity credits and RGGI funds could be included if they are not already considered in avoided capacity costs and carbon cost calculations.

¹⁴ Electric programs only

Additional Non-Energy Costs

- Quantifiable non-energy costs accruing from program participation (or a net deemed adder to represent average NEBS)

KEY SPECIFICATIONS FOR THE COST-EFFECTIVENESS TESTS

To set a standard that allows TRC tests conducted on Delaware's energy efficiency portfolio to be comparable, guidance is provided below with additional detail on inputs and equations for tests and parameters benefit-cost input metric definitions provided in Appendix E.

- **Benefit-Cost Ratio** - The operations of the tests specified above provide an output called the benefit- cost ratio (BCR). If the BCR is 1.0 or higher, it means that the benefits exceed the costs compared to standard energy supplies and are cost-effective. If the benefit-cost ratio is less than 1.0, it means that the costs of the energy efficiency supply portfolio are greater than those associated with conventional energy supplies
- **Net present value** - Cost-effectiveness of an energy efficiency measure, program or portfolio will be calculated based on the net present value of the costs and benefits valued in the TRC test discounted over the effective useful life of the measures installed.
- **Discount Rates** - The discount rates used in energy efficiency and demand reduction cost-effectiveness tests are to be based on a societal discount rate that considers the value of money acquired as a result of legislative decisions impacting the state's energy customers and their energy supply and cost-related benefits. The DNREC in consultation with the EEAC will set the rate for each program three-year cycle and apply that rate for all programs and initiatives performed during that cycle. Specifically, the discount rate will be set at the average long-term T-Bill rate over the last 30-years.
- **Effective Useful Life** - Measures installed via Delaware's energy efficiency programs shall have the energy savings counted and valued over the full effective useful life (EUL) of the installed measures. Delaware EULs will be based on estimated actual performance of equipment including equipment failure, removal, and cessation of use. This section is placed in the Delaware Framework because some states have elected to set policy-based EUL limits (i.e., 15 year/20 year maximum savings periods) on the lives over which energy savings are counted even though some measures perform longer than those policy-based EULs. EUL tables are included in the TRM.

EEAC Responsibility – Benefit-Cost Analysis

- Specify benefit-cost analysis and estimation approaches to be used in Delaware's energy efficiency and demand response programs and portfolios.
- Ensure that Program Administrators are following the benefit-cost approach as outlined in this Framework.

- Review and approve portfolio level benefit-cost analysis completed by Program Administrators and/or IECs on energy efficiency portfolios and programs.
- Coordinate with the PSC to provide advice on benefit-cost metrics, metric values, and calculation approaches.
- Establish or approve forecast, discount rates, avoided costs, line losses, NEB adders, and/or other major inputs.
- Oversee the evaluation contractors who will be performing the required benefit-cost tests to assure that they are using the approved formulas, metrics, and metric definitions when conducting the benefit-cost analysis for covered programs and portfolios.

Program Administrator Responsibility – Benefit-Cost Analysis

- Develop estimates of avoided costs and line losses, for approval by EEAC.
- Calculate the benefit-cost analysis for energy efficiency programs and portfolios for planning purposes using IEC inputs and TRM values.
- Report benefit-cost calculation results to EEAC in a clear, transparent way so that all collocations can be verified and replicated and that definitions for metrics and metric values are presented consistent with Oversight specifications.

12. ENERGY IMPACT BASELINE

For prescriptive measures, the Framework sets a common approach that applies to all measures. For custom measures, which can have different configurations and typical use conditions, the establishment of baseline conditions is dependent on the actions taken and the prevailing market and code conditions that apply to each project sampled in the evaluation. The following sections specify how baseline energy use levels used for assessing energy impacts will be established.

PRESCRIPTIVE MEASURES

The following is policy guidance to inform the Delaware TRM. The actual baseline used will be established in the TRM. Baselines for prescriptive measures will follow the approaches outlined below for both program models that are market driven, including replace on failure/end of life, new construction, renovation, remodel, or any other reason customer is already planning changes.. Unless specified in the TRM to be site or customer-type specific, the TRM will use one of the approaches below to establish deemed baselines. Details are provided below.

- **Code or standard:** Energy impact baseline is set at the minimum building code or the minimum appliance standard without compliance adjustments.
- **Market Mean or Mode:** Energy impact baseline is set at the mean or mode market practice for that equipment, depending on the distribution. Savings are estimated as the difference between the baseline and the program induced high efficiency unit.
- **Typical Code or Standard with Compliance Adjustment:** Energy impact baseline is set at the typically applied building code or appliance standard adjusted for estimated compliance. Savings are estimated as the difference between the compliance adjusted typical baseline and the program induced high efficiency unit.

In cases when a technology is replaced earlier than what would have occurred without the program (early replacement or “retrofit”), the baseline condition is the energy use condition prior to the program-induced change for the remaining useful life of the replaced measure. Once the remaining useful life has expired, the baseline should be established using one of the three methods outlined above and applied to the remaining useful life.

CUSTOM MEASURES

Estimating gross saving for custom projects is inherently more challenging than estimating gross savings for prescriptive measures. Custom projects do not have “typical” applications, even when the technologies being used are similar. In a custom project, each application of an energy efficient technology can be sufficiently different from those by other participants that independent, customer- specific baseline estimates of energy use are required in order for ex post energy savings estimates to be reliable. Because there are several different ways that

program managers and evaluation experts can define a custom baseline condition, significant differences in baseline approaches are required. Therefore, for custom measures baseline conditions will be set for each project being evaluated so that it reflects the typical conditions associated with that custom application. The IEC will review all baseline assumptions established by project engineers, and if appropriate, suggest modifications. In very large projects, the Collaborative can assign the IEC to directly establish baseline.

Collaborative Responsibilities – Energy Impact Baseline

- Oversee the evaluation efforts and review baseline approaches and savings assumptions to be used in the evaluation efforts ensuring they are developed in a manner consistent with the baseline approach established in this Framework.
- Gather advice, counsel, and recommendations on baseline approaches as they occur through the Framework updating process and the development or updating of the TRM .
- Instruct evaluation contractors to follow the Framework approach for setting baseline conditions

Program Administrator Responsibility – Energy Impact Baseline

- Provide Oversight with program base net assumptions for review and compliance with the approach outlined in this Framework.
- Develop custom baseline assumptions on a project-specific basis to support calculations of custom project gross savings.
- Administer the evaluation contracts.

13. UPDATE APPROACH

FRAMEWORK UPDATING PROCESS

The Delaware EM&V Framework is a living document that will be updated as needed. Updates will be done in a manner that ensures coordination with the Collaborative and the Program Administrators' EM&V teams. A coordinated approach will ensure that the update addresses issues identified by all stakeholders over the course of the year.

This updating process will be completed as needed and with ample time for the next EM&V planning period. Programs launched after the completion of the update process will use the updated Framework to develop that year's EM&V plan. Programs in the midst of a program evaluation cycle will use the standing Framework until the start of their next cycle, at which time they will adopt the new version of the Framework.

The updating process will include a 30-day review period where stakeholders will be asked to provide comments on the current Framework. At the close of this comment period, the DNREC will provide the Collaborative with a final list changes that will be made through the update process.

DNREC will review and approve the proposed list changes/inclusions in the update. Once approved, DNREC will work the EEAC Consultants to develop an updated draft Framework. The draft will be provided to the Collaborative for review and comment. The DNREC will have final approval on all updates to the Framework.

TECHNICAL REFERENCE MANUAL (TRM) PURPOSE AND UPDATING PROCESS

The Delaware TRM (based on the Mid-Atlantic TRM)¹⁵ will serve as the primary source for deemed gross savings and the associated calculation approaches used in Delaware. The Delaware TRM will serve as the default source for savings assumptions it addresses, as it has been specifically developed to address Delaware's unique market energy efficiency and climate. It is envisioned that the Delaware TRM will closely follow the Mid-Atlantic TRM, and that DNREC, the PAs, and the EEAC Consultants will closely coordinate with and participate in the Mid-Atlantic TRM update process. However, Delaware would reserve the right to adopt any amendments to the Mid-Atlantic TRM that the larger regional group does not directly incorporate. For this reason, Delaware will maintain a "Delaware Addendum" as the official TRM.

Updates to the Delaware TRM will be aligned with the update process for the Mid-Atlantic TRM. This process informs the next program year cycle and will be completed annually by July 1 in advance of the utility program planning cycle. Utilities launching programs January 1 will

¹⁵ The Mid-Atlantic TRM is an outcome of the Regional Evaluation, Measurement and Verification Forum ('the EMV Forum') sponsored by Maryland, Delaware, and the District of Columbia. Delaware has commissioned an Addendum to the TRM that provides assumptions for any measures identified as a gap in the Mid-Atlantic TRM and/or assumptions for measures that may need Delaware-specific considerations.

use the updated numbers in planning for the subsequent year. Utilities launching new programs in advance of January 1 of the subsequent year will use the standing values until the start of their next program year, at which time they will adopt the updates from the Mid-Atlantic TRM into the Delaware TRM for all forward-planning and reporting purposes.

DNREC will review and approve the proposed list of measure additions, deletions or modifications for inclusion in the update. Once approved, DNREC will work with the EEAC Consultant to develop a draft of the Addendum. DNREC will have final approval on all assumptions, algorithms, and deemed savings values included in the Delaware TRM¹⁶.

EM&V METHODOLOGIES PURPOSE AND UPDATING PROCESS

Delaware has commissioned an Addendum to the *Regional EM&V Methods and Savings Assumptions Guidelines*¹⁷ that provides methodologies for several additional program areas that are specifically relevant to the state of Delaware. The *Regional EM&V Methods and Savings Assumptions Guidelines* and the Delaware addendum to the *Regional EM&V Methods and Savings Assumptions Guidelines* will serve as the primary source for EM&V methodologies used in the state. Should there be overlapping measures between the *Regional EM&V Methods and Savings Assumptions Guidelines* and the Delaware methodologies addendum, the Delaware methodologies will serve as the default source.

Updates to the Methodologies Addendum will occur on an as-needed basis and will follow any practices of the Regional Evaluation, Measurement and Verification Forum.¹⁸ For more information, please reference the *Regional EM&V Methods and Savings Assumptions Guidelines*.

¹⁶ Because the primary TRM for the state of Delaware is based on the Mid-Atlantic TRM, updates to the Addendum will follow practices of the Regional Evaluation, Measurement and Verification Forum.

http://neep.org/uploads/EMV%20Forum/EMV%20Products/Mid%20Atlantic%20TRM_V1d_FINAL.pdf

¹⁷ DNREC as a member of the Northeast Energy Efficiency Partnerships Regional Evaluation, Measurement and Verification Forum ('the EMV Forum') sponsored by Vermont, New Hampshire, New York, Connecticut, Rhode Island, Massachusetts, Maryland, Delaware, and the District of Columbia and has also invested in the development of the *Regional EM&V Methods and Savings Assumptions Guidelines* document.

¹⁸ For more information on this, please reference the *Regional EM&V Methods and Savings Assumptions Guidelines*

<http://www.neep.org/initiatives/emv-forum/forum-products>

UPDATING TIMELINES

Table 13.1 below provides a summary of each stakeholder’s role in the update processes.

Table 13.1 – TRM Update Process

	Updated Annually	In Coordination with NEEP Efforts	Applied prospectively to next program cycle	Start date for updating ¹⁹	End date for Updating
Framework	If needed	Yes	Yes	July 1	October 1
TRM	If needed	Yes	Yes	Jan 1	July 1
Methodologies	If needed	Yes	Yes	April 1	July 1

DNREC Responsibility – Updates

- Initiate and manage updating process for all documents included in Section 13.
- Lead the various aspects associated with the coordination process to assure the assembly of change information and ideas inform discussions relating to those changes, then move to a decision regarding changes needed and incorporation of the changes into the new versions of the relevant documents.
- Obtain opinions from evaluation and program implementation experts as needed to inform change discussions and decisions.
- Solicit feedback from Collaborative and other interested parties as part of the updating process for each of the documents included in this section.
- Manage and oversee the update process for each of the documents included in this section.

Program Administrator Responsibility – Updates

- Develop recommendations for changes and participate in change meetings, emails, and discussions as appropriate.
- Provide feedback and insight into the updating process for the documents outlined in this section, including direct feedback and findings resulting from primary EM&V activity in Delaware.
- Provide opinions, comments, or responses on the recommended changes provided by others.

¹⁹ TRM and Methodologies are only updated if there is an identified need to add or amend measures or approaches. DNREC in coordination with EM&V Technical group will determine if the updates are needed.

14. COST RECOVERY AND INCENTIVE MECHANISMS

Title 29 establishes the opportunity and expectation that Commission-regulated affected energy providers in Delaware will administer efficiency programs in their territories, as well as recover the costs associated with delivering programs. These entities have certain advantages in offering efficiency services and the ability to engage with customers and build on existing relationships and systems. However, Commission-regulated affected energy providers can also have disincentives to pursue aggressive and exemplary efficiency investments. These can include financial harm resulting from reduced energy throughput on their systems and regulatory lag, as well as the fact that efficiency can reduce the need for future capital investments on the supply-side that could offer them an opportunity to earn a rate of return. Consistent with Title 29, opportunities for Commission-regulated affected energy providers to propose and pursue cost recovery mechanisms that can eliminate these disincentives and create positive incentives for efficiency investment should be allowed and encouraged. While the exact designs of any cost recovery and incentive mechanisms should be established by the Delaware PSC and initially proposed by Commission-regulated affected energy providers when filing efficiency plans, the sections below present general guidelines and principles related to these potential mechanisms.

PROGRAM COST RECOVERY

Program cost recovery refers to the collection of actual program expenditures from ratepayers. Below are principles that should apply to any proposed program cost recovery mechanism.

- PAs should be able to collect 100% of actual program costs prudently expended, with appropriate interest related to any delays or variances in collections.²⁰
- PAs should not earn any additional incentive above their actual costs plus appropriate interest based solely on the level of spending. While, incentives for performance can provide additional PA earnings (as discussed below), they should not be based solely on the expenditure of program costs.
- As much as is practically feasible, each customer class (residential, commercial, and industrial) should contribute to program costs in proportion to the allocation of program spending for services to those customer classes. Low income customers should be exempt from this allocation, as explained below.
- Program costs for programs serving low income customers should be allocated proportionally to all customers (residential, commercial, and industrial) in proportion to their relative energy loads.
- Consideration could be given to amortizing program costs over a period longer than one year to smooth rate impacts and better align program costs with realized

²⁰ As with all ratepayer expenditures, the PSC should have the right to disallow any expenses deemed imprudent, and nothing herein is intended to diminish that right.

benefits. In the event that program costs are amortized, rather than fully expensed and contemporaneously recovered in each year, any interest charges or credits (in the event of over payment) should be applied at a rate that reflects actual debt costs for a relatively risk free investment over that period of time. Note that short term debt interest rates may be substantially lower than overall utility weighted cost of capital.

- Even if programs are expensed and recovered each year, there must be a mechanism for annual true-up of any over or under collections. Short term risk free interest costs or credits can be applied to any true-ups.
- Program costs will not be put into rate-base.

LOST NET REVENUE

The PSC has established the possibility for a Commission-regulated affected energy provider to propose and gain approval for a decoupling mechanism at the time or after it proposes to deliver efficiency programs.²¹ Decoupling refers to breaking the link between utility revenue and actual throughput of energy on its system. As a result, decoupling is one method to remove disincentives a utility may have to invest in efficiency, as well as minimize other risks to utilities and ratepayers from weather and other uncontrollable events that affect energy loads. The following guidelines and principles shall apply to any mechanism related to utility recovery/adjustments that result from reduced net revenue caused by lower throughput as a result of efficiency investment.

- Any decoupling mechanisms should fully decouple throughput from revenue, and not be applicable solely to adjustments for efficiency impacts separate from other load variances.
- Full decoupling is preferable to an efficiency-specific Lost Revenue Adjustment Mechanism (LRAM) that compensates utilities solely for theoretical net lost revenue from efficiency programs, regardless of whether utility throughput actually exceeded or fell short of forecast sales in the immediately prior rate case.
- Utilities should not earn any additional positive incentives above actual net lost revenue, compared to planned sales and revenue expectations.
- Any decoupling mechanism should have a mechanism to true up any variances (either over or under collection) at least annually.
- Any true ups of variances shall accrue to the utility, or credit back to ratepayers, interest at an appropriate low risk, short term interest rate.

PERFORMANCE INCENTIVES

While recovery of program costs and adoption of a decoupling mechanism can remove many direct financial disincentives to utilities for investment in efficiency, they do not

²¹ Delaware PSC Order No. 8011.

necessarily provide a positive incentive for exemplary performance. Further, utilities may still perceive financial disincentives to efficiency investment because, all else equal, efficiency can reduce the need for future capital expenditures on which the utility could potentially earn a return. As a result, utilities should have the ability to propose performance incentives to the PSC. Below we provide guidelines and principles for any performance incentive (PI) mechanisms.

Earnings and/or penalties in any PI mechanism should be based on actual measurable performance that is under some control of the PA. Earnings targets should be sufficient to provide PAs with a reasonable incentive to pursue exemplary performance, and to put investment in efficiency on an equal footing with other PA earnings opportunities. However, they should also ensure ratepayers are protected from providing excessive earnings levels beyond those necessary to provide an adequate incentive to place efficiency on an equal footing with supply-side investments.

PI mechanisms should not tie earnings and/or penalties directly to expenditure, nor to simply performing specific activities, as opposed to actual and measurable program or portfolio performance. Note that initial “design” values of a total amount of potential earnings can be established based on a fraction of planned program expenditures, but this amount should not vary based on actual expenditures. The intent is to avoid incentives to invest funds inefficiently to increase rewards. However, a mechanism that directly rewards a PA for improvements to (or penalizes a PA for reductions to) planned rates of expenditure (*e.g.*, program budget per lifetime kWh saved) can be considered.

PI mechanism awards shall be based on independently evaluated results, and utilities shall be exposed to retroactive risk from *ex-post* evaluations for purposes of awarding incentives and/or penalties.

Performance rewards/penalties should be scalable, and allow for a range of continuous outcomes over some reasonable range of performance targets, as opposed to being only a “win it or lose it” design. For example, one might have a PI mechanism that allows rewards to begin at some level of goal achievement less than 100% of planned goal, with scalable increases in rewards up to some level above 100%. This will ensure that PAs have incentives to continue to strive for improvements even if it is clear they will fail to meet a specific plan goal or will definitely exceed the goal. Any threshold level(s) less than 100% of goals should be established at a level that could reasonably still result from a good level of PA performance.

PI mechanisms should have an absolute cap at which point continued exemplary performance cannot translate into additional earnings. However, this cap should be set well above the plan goal to encourage exemplary performance. This is intended to protect ratepayers from the potential for unlimited and possibly excessive PA rewards.

PI mechanisms shall consider relevant performance metrics, consistent with the overall policy goals of efficiency investment, that could include:

- Level of lifetime energy savings
- Level of peak demand savings

- Level of gross or net total resource cost benefits
- Participation or market share goals
- Equity goals (potentially both related to customer type/demographics and/or geographic equity)
- Specific metrics tied to programs related to overall program goals (e.g., reaching a target level of comprehensiveness and per participant savings, achieving a particular market share target, etc.)
- Improvements in cost efficiency (\$/lifetime-kWh or \$/lifetime-therm saved)²²

PI mechanism proposals should consider multivariate designs, whereby multiple parameters can be rewarded/penalized to ensure against perverse incentives that could lead to undesirable policy outcomes. For example, providing an incentive solely for achieving savings targets or cost efficiency could encourage cream skimming and detract from other policy goals such as achieving broad equity, participation and comprehensive capture of all cost-effective opportunities. Therefore, consideration should be given to including other parameters that reward other policy goals that could be hurt by a sole focus on program savings. These might include metrics related to achieving a certain level of comprehensiveness in savings per participant, achieving certain participation or market share levels, or equity targets.

PI mechanisms should consider multiyear approaches tied to cumulative performance over the entire three-year planning period. This can be beneficial by allowing for metrics that better align with long term goals and plans; avoiding perverse incentives to arbitrarily close projects or make expenditures before or after a specific date; and minimize the burden on EM&V resources. However, in the event that PI mechanisms establish multiyear performance metrics, allowance for partial payments of expected rewards annually, with a mechanism to true up any over or under collections, can be considered.

²² If an incentive is provided for improved cost efficiency, it should not represent a majority of potential incentive awards and should be balanced by other metrics that provide countervailing policy pressure against potential “cream skimming,” such as metrics related to comprehensiveness of savings.

APPENDIX A – DELAWARE TRM

This appendix provides direct links to the Delaware TRM this also includes and Equipment Useful Life table.

ADD LINK TO THESE DOCUMENTS ON DNREC SITE HERE IN FINAL VERSION.

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APPENDIX B – REGIONAL EM&V METHODOLOGIES AND SAVINGS ASSUMPTION GUIDELINES & DELAWARE ADDENDUM

This appendix provides direct links to the Regional EM&V Methodologies and Savings Assumptions and Guidelines and the Delaware Addendum.

ADD LINK TO THESE DOCUMENTS ON DNREC SITE HERE IN FINAL VERSION

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APPENDIX C – PJM REGIONAL CAPACITY MARKET FAQ'S

This appendix provides a direct link to the PJM Regional Capacity Market FAQ's document.

ADD LINK TO THESE DOCUMENTS ON DNREC SITE HERE IN FINAL VERSION.

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APPENDIX D – PJM REGIONAL CAPACITY MARKET RESOURCES

This appendix provides direct links to information related to PJM and should be referenced in advance of participation in regional capacity markets.

- PJM manuals 18 (PJM Capacity Market), 18B (Energy Efficiency Measurement & Verification), and 19 (Load Forecasting and Analysis) are most relevant to the RPM process and M&V requirements. These can be found here - <http://www.pjm.com/documents/manuals.aspx>.
- PJM's website contains a training section - <http://www.pjm.com/training/training-material.aspx>. There are a number of training documents related to the RPM.
- The RPM has its own dedicated website - <http://www.pjm.com/markets-and-operations/rpm.aspx>. You will find a wealth of information here, including an overview of the RPM²³, auction user information like the user guide for the online eRPM system, historical auction results by delivery year, base and incremental auction frequently asked questions, and a breakdown of the DPL and DPL-south zones by zip code.
- The RPM energy efficiency FAQs²⁴ are very informative and can be found in the RPM section of PJM's website.

²³ <http://www.pjm.com/markets-and-operations/~media/markets-ops/rpm/20090406-dr-ee-in-rpm-collateral.ashx>

²⁴ <http://www.pjm.com/markets-and-operations/rpm/~media/markets-ops/rpm/rpm-auction-info/rpm-energy-efficiency-faqs.ashx>