



TARGETED APARTMENT BLOCK PROTOCOL

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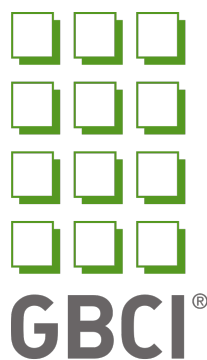


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THE INVESTOR CONFIDENCE PROJECT

The Investor Confidence Project (ICP) is a global initiative that focuses on increasing energy efficiency deal flow by ensuring that projects are engineered robustly, financial returns are predictable, and project underwriting can be streamlined. The ICP system is comprised of the ICP Protocols and the Investor Ready Energy Efficiency™ certification which offer a standardized roadmap for project developers, a market tested methodology for program administrators, and a certification system for investors and building owners to accurately and efficiently assess project risk.

ICP is administered by Green Business Certification Inc. (GBCI) and was conceived, incubated and developed by the Environmental Defense Fund (www.edf.org).

For more information, please visit:

ICP North American (www.eepformance.org) or ICP Europe (europe.eepformance.org)

INVESTOR READY ENERGY EFFICIENCY™

Investor Ready Energy Efficiency™ (IREE) is a certification awarded to energy efficiency retrofit projects that conform to the requirements of the ICP Protocols, were originated under the direction of qualified providers, have been independently reviewed by an ICP Quality Assurance Assessor, and are certified by GBCI. IREE projects provide investors, building owners, and other stakeholders with an increased level of confidence in project quality.

Investor Ready Energy Efficiency™ certification occurs after completion of project development and engineering, but prior to construction.

Development of an ICP compliant project includes the following two periods:

- **Certification Period** (pre-IREE Certification). The Certification Period includes all procedures and documentation associated with project development that occur prior to construction. This includes the development of the M&V plan (as well as the OPV and OM&M plans, if the project's complexity warrants their development) which describes the tasks and documentation that will be performed during the Performance Period.
- **Performance Period** (post-IREE Certification). The Performance Period refers to the construction and post-construction (post-retrofit) period after IREE certification is achieved. The ICP Protocols require certain procedures and documentation that occur during the Performance Period which are specified in plans that are developed during the Certification Period. These plans, and the requirements identified in them, should be explicitly required by the investor or building owner to be included in the project developer's scope of work and contract. If necessary, the services of the Quality Assurance Assessor or other third parties may be retained during the Performance Period to oversee implementation.



ICP TARGETED APARTMENT BLOCK PROTOCOL

To conform to the ICP Protocols, projects must meet the specified procedural and documentation requirements detailed in this document. In order to ensure the protocol requirements optimally fit the project, it is crucial that the developer selects the [correct ICP Protocol](#). This protocol is intended for apartment block retrofits and project scopes that include:

- **Single measure projects or multi-measure projects with no interactivity** (apart from lighting energy conservation measures (ECMs))
- **The scope of the measures are typically not that complex**, and the project does not require dynamic building simulation modelling

Additional resources to this protocol include:

- [Project Development Specification](#) is the reference guide for all ICP Protocols and includes detailed explanations of the requirements as well as supporting references and tools.
- [ICP Protocol Glossary](#) defines industry terminology found in the ICP Protocols.
- [ICP Acronym Dictionary](#) defines the various industry acronyms.
- This document also makes use of tool-tips to provide context and information associated with various terms and requirements.

GLOBAL STANDARDS AND REFERENCES

Throughout this document, reference is made to European and international standards, guidance and resources when relevant to protocol requirements. Where a relevant national standard, guidance or resource is available, this may be used as an optional alternative resource to the European and international standard. Relevant national standards are shown in the ICP Annex A, “Index of National Resources”. Resource references are shown in *italics*, followed by a specific reference number in square brackets (e.g. “[2a]”) which can be used to locate it in the *Annex A*.

ICP PROJECT FRAMEWORK



The ICP protocols are structured based on five project lifecycle phases that represent the entire lifecycle of a well-conceived and well-executed energy efficiency project. For each phase, the protocol establishes minimum requirements for:

- **Procedures** - specific tasks to be performed during the certification period.
- **Documentation** - required documentation supporting procedures, calculations, models, as well as plans that specify procedures to be executed during the performance period.

1.0 BASELINING

The baselining efforts involve the development of a baseline specific to the proposed ECMs and collection of all information needed to perform the tasks associated with the savings calculations, economic analysis, and commitment to develop the procedures required for the performance period.

The baseline must establish how much energy a system or equipment can be expected to use over a representative period. The baseline model should be normalized by factoring in the impact of independent variables such as weather, occupancy, and operating hours of the building's energy use as necessary. Where demand charges or time-of-use pricing are in effect, load profiles must be provided to show the pattern of daily demand and incorporated annual adjustments.

The retrofit isolation baseline analysis will generate a comparison of the projected energy savings versus the current annual energy use of the affected systems. This retrofit isolation baseline will subsequently be used for the IPMVP Option A or B efforts.

1.1 PROCEDURES

1. **Collect energy source data, independent data, and utility rate schedules** for all energy sources to inform baseline and savings calculations. Data to gather should include:
 - a. **Energy Use Data for Retrofit Isolation Baseline:** Collect energy use data specific to the ECMs, including all meters and energy accounts for related end-uses. [\[PDS Section 1.2.1\]](#)
 - i. These data should be used as the basis for an analysis that is compliant with IPMVP Option A or B.
 - ii. For non-metered fuel types either install sub-metering, utilize billing, or other final use data to estimate energy use.
 - iii. The baseline period should fairly represent all operating conditions of a normal operating cycle for parameters relevant to the ECMs. Parameters may be continuously measured or periodically measured for short periods. The frequency of measurement will be determined by the expected variation in the parameter. For weather dependent end-uses, or end-uses that vary based on other independent variables, the metering period should cover a period that will capture both minimum and maximum loads.
 - iv. Cost data for electricity and each energy source should also be collected including unit and total annual costs.
 - v. For electricity, monthly peak demand (in kW) should be recorded as well as the peak output from any on-site generation and the associated fuel source, if relevant to the ECMs.
 - b. **Measurement Boundary:** Clearly define the measurement boundary. The boundary can be defined by a specific piece of equipment, a combination of equipment comprising a building subsystem, or a specific end-use. Any interactive effects should also be established and either included within the measurement boundary or their impact estimated for lighting retrofits that have a significant impact on heating and cooling loads. [\[PDS Section 1.5 and PDS Section 5.2\]](#)
 - c. **Measured and Estimated Parameters:** When considering an Option A approach, and what variables to estimate, consideration should be given to the amount of variation in baseline energy consumption or the energy impact that variables have on the ECMs. Estimates should be based on reliable, documentable sources that provide a high degree of confidence. These estimates should never be based on “rules-of-thumb” or proprietary

- sources (“black box”). Key parameters that are not consistent enough to be used for estimates must be measured. Where multiple versions of the same ECM installation are included within the measurement boundary, spot sampling is permitted.
- d. **Weather Data:** Where the ECM-related baseline energy consumption for the defined baseline period would be affected by weather, acquire weather data (at least degree-days for heating and cooling) from the closest weather station or on-site measurement for the time interval coinciding with the interval of the energy use. [\[PDS Section 1.2.3\]](#)
 - e. **Occupancy Data:** Where the ECM-related baseline energy consumption for the defined baseline period would be affected by occupancy, acquire vacancy rates, space uses and occupancy schedules for the defined baseline period from the tenant, building owner or building operator, following the requirements set out in *EN 16247-2 Energy audits – Part 2: Buildings (section 5.3.2) [2b]*. This should include the tenant information (e.g. the nature of their lease, type of business, occupancy times) where relevant as well as an assessment of how occupancy patterns affect energy consumption. [\[PDS Section 1.2.4\]](#)
 - f. **Other Independent Variable Data:** Acquire other independent variables that significantly affect the energy use, such as sales or production volume, for the defined baseline period chosen or as otherwise needed for an accurate regression model. [\[PDS Section 1.2.1\]](#)
 - g. **Building Asset Data:** These data will be specific to the ECMs and systems involved in the project, and therefore only need to address the relevant systems and do not necessarily need to include a comprehensive data set for all building systems. Acquire data including accurate total floor area (for conditioned and unconditioned spaces) following the guidance provided by *EN ISO 13790:2008 Energy performance of buildings – Calculation of energy use for space heating and cooling (section 3.2.6) [2a]*, and material specifications/inventories based on building drawings, following the requirements set out in *EN 16247-2 Energy audits – Part 2: Buildings (section 5.3.2 and Annex D) [2c]*. This information will be referenced in any future adjustments to the building asset that may be made. [\[PDS Section 1.2.5\]](#)
 - h. **Baseline Operational/Performance Data:** Acquire system performance data used to inform the energy savings calculations (e.g. equipment efficiencies and capacities). These data should include data for building systems associated with the project ECMs and can be collected through interviews, reviews of building documentation (as-built plans, controls sequences, etc.), observations, spot measurements, short-term monitoring, and/or functional performance tests. [\[PDS Section 1.2.5\]](#)
 - i. **ECM Characteristics:** For the proposed ECMs, load and hours-of-use components, and whether these components are constant or variable should be documented. [\[PDS Sec 1.5\]](#)
2. **Normalize/calendarise the independent variable data** to the same time interval that aligns with the defined baseline period, if appropriate.
 3. **Develop the retrofit isolation baseline** conforming with the requirements of IPMVP, and informed by energy-use characteristics of the equipment or end-use broken down into load and hours-of-use components, and whether these components may be considered constant or variable. Sources of information should include equipment inventories and operating performance, and should be consistent with calculated energy end-use consumption.
 4. **Achieve an appropriate goodness of fit** of energy data variability to independent variables according to the IPMVP’s Statistics and Uncertainty for IPMVP 2014 if regression analysis is being performed to develop the retrofit isolation baseline. The adjusted R^2 value shall be at least 0.75 and a CV[RMSE] shall be less than 0.2 subject to extenuating circumstances. In the event that the fit is outside the range, extenuating circumstances must be described and documented.

5. **Establish monthly peak demand and pricing** (where peak demand pricing is in effect and the ECM(s) has demand pricing based savings), based upon the monthly bills. Where monthly data are not available, explain why, and describe any potential impacts this may have on the baseline and savings calculations as well as how these issues will be addressed. [\[PDS Section 1.6\]](#)
6. **Chart average daily demand** (where demand charges or time-of-use pricing is in effect) in 15-minute intervals (maximum available frequency if 15-minute is not available) with time on the x axis and kW on the y axis for typical weekday and weekend days in the spring, autumn, winter, and summer. [\[PDS Section 1.6\]](#)

1.2 DOCUMENTATION

- Full energy data as a computer-readable file, including:
 - Raw meter readings should include from-date and to-date, energy-unit value, energy use charges, demand quantities and demand charges. Energy sources must be consolidated to the same periods, if relevant to the ECMs. Data may also include bulk-delivered fuel information, including units delivered and associated costs. Local currency should be used.
 - The dataset must cover all forms of purchased energy and energy produced on-site that are part of the baseline. Where applicable, this will include aggregated tenant data or an approximation of tenant energy use, descriptions of the metering and sub-metering of energy in the building, and an explanation of how energy costs are paid by building occupants.
 - If relevant, provide a brief description of how periods are consolidated to the baseline periods applied. Dates of meter reading periods will vary from one energy source to another. Refer to *ISO 16346:2013 Energy Performance of Buildings – Assessment of Overall Energy Performance (section 8.2.2) [2d]* for guidance on partial year/month data “normalization/calendarisation.”
- The start and end dates of the baseline period and why that period was chosen.
- Definition of the measurement boundary.
- Weather data (if utilized) used in the regression analysis corresponding to the baseline period (containing heating and cooling degree day and average daily temperature data for the site as described above).
- As appropriate for recommended upgrades, include building drawings, equipment inventories, system and material specifications, field survey results and/or CAD take-offs, observations, short-term monitored data, spot measurements, and functional performance test results.
- Utility rate structure as published by the utility and the commodity provider (if the two are separate) including a breakdown of distribution costs, commodity costs, demand charges, taxes, and time-of-day variability for each of these elements.
- Copies of at least one bill, or equivalent data, preferably in a machine-readable format for all energy sources consumed including the description of the tariff structure and any fixed charges. If tenants pay their bills directly, provide a breakdown by owner-paid and tenant-paid utilities.
- List of project-specific routine adjustment factors to be included in the M&V Plan.

2.0 SAVINGS CALCULATIONS

Calculations of estimated savings for projects of the scale this protocol is designed for must be based on “open-book” calculation methods or tools. The calculations must be based on sound engineering methods and consistent with the IPMVP approach chosen. These same calculations will be used to perform verified savings calculations as part of the Option A/B M&V effort, using post-retrofit monitored data.

Use of proprietary “closed book” calculation methods is not recommended. However, if proprietary tools are used for savings calculations, they must be well documented. The documentation must include history of previous use, detailed description of the calculation methodologies and assumptions used by the tool, as well as papers, studies or documentation demonstrating the technical rigor of the tool and methodologies employed.

Apartment block projects may comprise a situation involving split incentives, which can potentially inhibit a building owner’s incentive to invest in the energy efficiency project. A split incentive (or misaligned incentive) involves a transaction where the benefits do not accrue to the person who pays for the transaction. This occurs in situations involving tenant-paid utility bills - the building owner pays for the retrofits, but does not recover savings from reduced energy costs that accrue to the tenant. This situation warrants consideration and methods such as Green Leasing or other savings recovery methods to incentivize the building owner investment in the energy efficiency project. While critical to the financing component of project development, these considerations are beyond the scope of this protocol.

However, for these projects in which the tenants pay their own utility bills, savings estimates should be developed separately for those that accrue to the building owner, and those that accrue to the tenants, so that appropriate savings recovery efforts can be developed and potentially employed to incentivize the project. Additionally, investment costs should similarly be developed separately for those measures applicable to owner-paid utilities and tenant-paid utilities, such that methods can potentially be developed to pass on these capital expenses directly to the building tenants.

2.1 PROCEDURES

Develop energy savings calculations [PDS Section 2.5]

1. **Use open-book spreadsheet(s), or commercially available or in-house method(s)** to develop energy savings estimates.
2. **Choose an individual to perform energy savings calculations with one of the following:**
 - a. Nationally/Internationally recognised energy savings calculation certification (see *Annex A*),
or
 - b. Five or more years of energy savings calculation experience documented in the form of a CV outlining relevant project experience.
3. **Prepare input values** using on-site observations and measured data.
 - Prepare transparent calculations in a readily readable and usable form based on building documentation from plans, equipment schedules, field confirmations, observations and tests.
 - Document calculation processes, formulas, as well as assumptions used and their sources.
 - Where inputs must assign efficiencies, rates, and other values that are not readily measurable, the basis of such assignments must be clearly stated.

- Identify equipment part-load profiles, operating conditions and associated efficiencies.
 - Confirm operating schedules for seasonal variations, zone variations, overtime use, cleaning schedules and practices.
 - Disclose and describe inputs/outputs (identify and document defaults versus assumptions) including those from any companion tools (e.g. load calculators, field testing) used to create inputs for the savings calculations.
4. **Tune energy savings calculations and input variables.** Calibrate pre-retrofit energy consumption estimated for each system involved in an ECM to the estimated or measured energy end-use consumption. Compare estimated energy savings to “rules of thumb” or “back-of-the-envelope” calculations, and previous estimates from similar past projects. Inform inputs based on actual project data.
 5. **For lighting projects only, account for interactive effects** with building heating and cooling loads, as well as interactions between the lighting measures themselves where required.

Analysis of Energy Conservation Measures (ECMs) [\[PDS Section 2.5\]](#)

1. **Ascertain the preferred financial analysis metrics** and criteria of the investor (or owner) in order to evaluate ECMs. Metrics may include simple payback period (SPB), return on investment (ROI), internal rate of return (IRR), net present value (NPV), cash-flow analysis, and/or savings-to-investment ratio (SIR). [\[PDS Section 2.6\]](#)
2. **Develop a set of recommended ECMs** and select ECMs that are likely to achieve the investment criteria, based on the experience of the engineers involved, building owner preferences, observed condition and operation of existing systems, preliminary calculations, and contractor recommendations. [\[PDS Section 2.1\]](#)
3. **Establish preliminary cost estimates** for each ECM under consideration. [\[PDS Section 2.7\]](#)
 - At the feasibility stage, initial quotes may be obtained from the contractor(s). Alternatively, cost estimates may be based on the engineer’s experience with previous projects, detailed conceptual estimates, nationally recognised sources of cost estimating data, general contractor quotes or other sources.
4. **Calculate energy savings performance** and cost effectiveness of each ECM individually using calculation methods such as temperature bin analysis and regression analysis. For each ECM, clearly document the calculation methodology, formulas, inputs, assumptions and their sources. [\[PDS Section 2.5\]](#)
 - Refer to IPMVP guidance and *EN 16212:2012 Energy Efficiency and Savings Calculation, Top-down and Bottom-up Methods (section 6) [4d]* for detailed guidelines for calculation methods and best practices.
 - Vetted calculation tools can be used or referred to as models for calculation methods.
 - Screening tools are an acceptable method for preliminary consideration of measure applicability, but must not be used as a substitute for detailed calculation methods.
 - Note: If third-party proprietary calculation tools are used, sufficient documentation must be included to validate unbiased assessment of energy savings estimates.
5. **Provide a statement of the energy prices** used to establish the monetary value of the savings. This conversion from energy savings to cost savings must be based on the appropriate local utility rate schedule in effect at the time or, if the facility is purchasing from an independent vendor, the commodity price and the utility distribution schedule of charges.
6. **Evaluate economics of each ECM** and package of ECMs with the owner in order to select a final list of ECMs to be included in the bid package.

7. **Develop final pricing for ECMs** selected to be included in the project scope including operation and maintenance costs. Finalize/finalise model-based analysis and recommendations based upon pricing from bids received.
 - The final documentation package must have pricing based on bids that represent the price for which a contractor has committed to make the improvements.
8. **Prepare a final report summarizing ECMs** and compiling all required supporting data. The report must include a summary table with final energy cost savings and pricing for each measure and the package of measures.

2.2 DOCUMENTATION

- Qualifications of the person(s) performing the savings calculations.
- ECM savings results including:
 - Workbooks, spreadsheets and other calculation tools used to develop savings estimates.
 - Disclosure and description of inputs (identify and document defaults versus assumptions), including those from any supporting tools (e.g. load calculators, field testing) used to create inputs for the spreadsheet calculations.
 - Calculation process description, that with the necessary input information, would allow a reviewer to reconstruct the calculation including documentation of the formulas used, and assumptions used and their sources.
 - Description of interactive effects on heating and cooling loads associated with lighting retrofits and document estimates of impacts on energy savings.
- Weather files that were used for ECM savings calculations if relevant.
- Report: Use of an industry-accepted format for reporting of results and for compilation of methods and underlying data is recommended. Refer to *EN 16247-2 Energy audits – Part 2: Buildings (section 5.6) [4c]* for the industry standard for report presentation of ECM, building and energy use data.
 - Annual predicted energy savings by fuel type shall be documented in terms of energy units, a percentage of the total volume of each energy source and as cost savings using the correct marginal rate for that energy type. [\[PDS Section 2.8\]](#)
- Basis for cost estimates.

3.0 DESIGN, CONSTRUCTION AND VERIFICATION

Design, construction and verification comprise the inter-related tasks associated with designing, installing, and verifying prescribed ECMs. The ICP Protocols do not address specific requirements associated with design and construction, but it is important that the teams involved commit to realizing the intent of the recommended ECMs accepted by the project owner.

The ICP verification methodology utilizes an Operational Performance Verification (OPV) approach to ensure that the individual implemented ECMs were installed correctly and are capable of achieving the predicted energy savings. OPV is a targeted process that focuses specifically on the ECMs involved in the project and differs from traditional Commissioning (Cx) which typically refers to whole building optimization.

The OPV process involves various methods based on measure type, complexity, and other factors. OPV processes may include visual inspection, targeted functional performance testing, spot measurements or short term monitoring of the installed systems and control sequences.

The OPV effort may be performed by an independent party or by the project developer as long as a Quality Assurance Assessor is providing oversight to these efforts. Procedures performed during the performance period should be specified in the OPV Plan and addressed in the proposal and contract.

3.1 PROCEDURES

1. **Appoint an Operational Performance Verification Resource** who has one of the following qualifications:
 - a. Nationally/Internationally recognised commissioning certification (see *Annex A*), or
 - b. Five years or more of commissioning experience documented in the form of a CV outlining relevant project experience
2. **Develop a Simple Operational Performance Verification Plan** (pre-construction) that includes:
 - a. Procedures to consult with the project developer
 - b. Procedures to verify that the ECMs have been implemented as designed and can be expected to perform as conceived and projected by the energy audit. For simple ECMs typically involved with targeted projects, this usually involves simple methods such as visual inspection or spot checking system operation. [\[PDS Section 3.2\]](#)
 - c. Provisions for the development and implementation of a training plan for operators to be conducted at the conclusion of the OPV effort that will train them in the correct operation of all new systems and equipment including how to meet energy performance targets. [\[PDS Section 3.3\]](#)
 - d. Provisions to update an existing Systems Manual (if one exists) at the conclusion of the OPV effort to document the modified systems and equipment and the process and responsibilities for addressing any future operational issues. [\[PDS Section 3.4\]](#)
 - e. Description of a simple OPV report to be developed at the conclusion of the OPV effort that will detail activities completed as part of the OPV process and include significant findings from those activities.

3.2 DOCUMENTATION

- Qualifications of the Operational Performance Verification Resource.
- Simple Operational Performance Verification Plan.

4.0 OPERATIONS, MAINTENANCE, AND MONITORING

Operations, Maintenance, and Monitoring (OM&M) is the practice of systematic monitoring of energy system performance and implementing corrective actions to ensure “in specification” energy performance of ECMs over time. Good OM&M processes involve a proactive strategy for achieving occupant comfort while optimizing energy performance. Procedures to be performed during the performance period should be specified in the OM&M Plan (if warranted by the complexity of the ECMs or the scope of the project) and addressed in the proposal and contract.

4.1 PROCEDURES

1. **Select ongoing management regime** including either periodic inspection, Building Management System (BMS) reporting, software-based monitoring and fault detection, periodic recommissioning, or a combination of these approaches. [\[PDS Section 4.1\]](#)
2. **Develop a Simple Operations, Maintenance and Monitoring Plan** (pre-construction) that includes:
 - a. A description of the OM&M management regime to be selected [\[PDS Section 4.1\]](#)
 - b. Defined roles and responsibilities of the OM&M staff and plans for issue resolution and preventative (or predictive) maintenance.
 - Develop an organisational chart establishing contact information for all personnel involved in ongoing commissioning process and clear internal responsibility for the monitoring and response activities.
 - c. Provisions for the development and implementation of a training plan that will be conducted for facility staff and service providers on new/modified equipment, management and monitoring software, and reporting regime. This training is to be conducted at the conclusion of the OPV effort and can be combined with the training described in the OPV section. Refer to *EN 15331:2011 Criteria for design, management and control of maintenance services for buildings [6a]* for guidance [\[PDS Section 4.3\]](#)
 - d. Description of the process to develop performance verification criteria based on the OM&M regime(s) selected.
 - e. Provisions for updating the Operator’s Manual (if one exists) targeting the new systems and their operation including assignment of responsibilities for communication of performance issues and implementation of corrective action. [\[PDS Section 4.2\]](#)
 - f. Provisions for the development and execution of instructions to notify building tenants of the project’s implemented building improvements and descriptions of any associated best practices or recommended behaviour modifications.

4.2 DOCUMENTATION

- Simple Operations, Maintenance and Monitoring Plan.

5.0 MEASUREMENT AND VERIFICATION

Measurement and Verification (M&V) activities verify actual versus predicted performance and are crucial to understanding the efficacy of energy efficiency measures and projects. Prior to investment decision-making (e.g. as part of contract development and investment due diligence), an IPMVP-adherent M&V Plan for an energy efficiency improvement project must be developed and specified to ensure that reliable accounting methods for energy savings are in place.

The M&V procedures for this protocol are consistent with the methods outlined in IPMVP Core Concepts Option A (Retrofit Isolation: Key Parameter Measurement) and/or Option B (Retrofit Isolation: All Parameter Measurement). In this approach, the pre-retrofit baseline energy use of the components affected by an ECM savings that was developed in the Baseline section of this protocol is used as the starting point for M&V calculations. The approach requires the following adjustments to retrofit isolation baseline energy use:

1. **Routine adjustments:** Account for expected changes in energy use.
2. **Non-routine adjustments:** Account for unexpected changes in energy use due to factors other than the installed ECMs.

This adjusted baseline represents what the baseline energy use would have been if the project ECMs had never been installed, under the same set of post-retrofit conditions. Realized savings are then determined by comparing this adjusted pre-retrofit baseline energy use model with the actual post-installation energy use of the components affected by an ECM from the energy use of the rest of the building. In the case of Option A, some of these parameters are estimated rather than measured. The energy savings are verified through comparison of the pre- and post-retrofit energy performance of the system(s).

Selection of an Option A or Option B approaches should depend on the level of energy savings and the degree of confidence or variability associated with savings predictions for each ECM, and the parameters associated with the energy savings. Refer to IPMVP documentation for guidance on selecting the most appropriate Option for an ECM.

The M&V effort may be performed by an independent party or by the project developer as long as a Quality Assurance Assessor is providing oversight to these efforts.

5.1 PROCEDURES

The M&V efforts must fully comply with applicable sections of IPMVP Core Concepts-2016 Option A or B. [\[PDS Section 5.1\]](#)

1. **Appoint an M&V Professional** during the certification period who has one of the following qualifications:
 - Association of Energy Engineers (AEE) Certified Measurement & Verification Professional (CMVP) certification, **or**
 - At least five years of demonstrated M&V experience documented in the form of a CV outlining relevant project experience
2. **Develop an IPMVP based M&V plan** as early in the project development process as possible that adheres to the IPMVP Core Concepts-2016, Section 7.1. This plan should be developed pre-construction.

5.2 DOCUMENTATION

- M&V plan adhering to the IPMVP Core Concepts-2016, Section 7.1.

6.0 PROJECT DEVELOPER REQUIREMENTS FOR IREE CERTIFICATION

ICP's IREE certification is designed to ensure that projects are robustly engineered and their savings predictions are reliable. In order to support this goal, project developer firms who submit projects seeking IREE certification must meet a number of requirements to ensure that they possess adequate experience, credentials, training and other criteria. These qualifications will be verified during the IREE certification process.

IREE project certification requirements shall consist of:

- The Qualifying Individual (a licensed Professional Engineer or AEE Certified Energy Manager or approved national equivalent) who is associated with the project development firm must sign off on a project's compliance with the ICP Protocols in order to be certified.
- The qualifying individual or other employee of the project developer firm seeking IREE certification of a project must possess and demonstrate 5 years of relevant industry experience via a CV, project history, or other means.
- Firms must submit three example projects that demonstrate that the project developer seeking IREE certification of a project has experience performing, planning, or managing tasks associated with all five of the ICP Lifecycle Phases consisting of Baselineing; Savings Calculations; Design, Construction & Verification; Operations, Maintenance & Monitoring; and Measurement & Verification.
- Project developer firms seeking IREE project certification must provide proof of insurance coverage for error and omissions / professional liability (or equivalent coverage) with a minimum of \$1MM coverage per claim in the United States or appropriate coverage for other countries.

These requirements are meant to serve as minimum requirements to determine the experience and capability of project developer firms. There are cases where these qualities may be difficult to demonstrate and ICP will review and consider such cases when necessary. Please contact ICP with any questions or concerns.