BASIC COMMERCIAL PROTOCOL

VERSION 1.0 – October 2020

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 comprises 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 www.eeperformance.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 increased 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 the implementation.

ICP Targeted Commercial Protocol

To conform to the ICP Protocols, projects must meet the specified procedural and documentation requirements detailed in this document. To ensure the protocol requirements optimally fit the project, the developer must select the correct ICP Protocol. This protocol is intended for commercial building retrofits and project scopes that include:

- **Single measure projects or multi-measure (3 measure maximum) projects with no interactivity** (such as limited lighting retrofit, PV array installation, pump motor replacement, etc.)
- **The scope of the measures is typically not that complex**, and the project does not require dynamic building simulation modeling, nor does it fundamentally change a building's design.
- **Energy Conservation Measures have limited integration** with other building systems and limited weather and occupancy dependency.
- **Projects with shared performance risk**, such as energy service agreements, pay-for-performance.
- **Use of automated advanced M&V** to provide rapid feedback.

Additional resources to this protocol include:

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

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, and plans that specify procedures to be executed during the performance period.

BASELINING

The baselining efforts involve developing a baseline specific to the proposed energy conservation measures (ECMs) and collecting all information needed to perform the tasks associated with the savings calculations, economic analysis, and commitment to developing 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 retrofit isolation baseline analysis will compare the projected energy savings versus the current annual energy use of the affected measures.

1.1 Procedures

1. **Collect energy source data, independent data, and utility rate schedules** for all energy sources to inform baseline and savings calculations, including:
   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 - refer to ASTM E2797- 11 Building Energy Performance Assessment (BEPA) Standard methodology. [PDS Section 1.2.1]
      i. The baseline period should fairly represent all operating conditions of a typical operating cycle for parameters relevant to the ECMs. Parameters may be continuously measured, periodically measured, or estimated.
      ii. Cost data for the electricity and each energy source should also be collected, including unit and total annual costs.
   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.
   c. **Occupancy Data**: 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. affect energy consumption. [PDS Section 1.2.4]
   d. **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. [PDS Section 1.2.5]
   e. **Baseline Operational/Performance Data**: Acquire system performance data 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]
   f. **ECM Characteristics**: For the proposed ECMs, load and hours-of-use components and whether these components are constant or variable should be documented. [PDS Section 1.5]

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 when available.
- Define the start and end dates of the baseline period and why that period was chosen.
- Definition of the measurement boundary.
- As appropriate for recommended upgrades, including 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.
- 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.

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.

2.1 Procedures

Develop energy savings calculations [PDS Section 2.5]

1. **Use an open-book spreadsheet(s) or commercially available or in-house method(s)** to develop energy savings estimates.
2. **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.
   - Confirm operating schedules for seasonal variations, zone variations, overtime use, cleaning schedules, and practices.
3. **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.
4. **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. Determine **the preferred financial analysis metrics** and criteria of the investor (or owner) in order to evaluate ECMs. Metrics may include a simple payback period (SPB), return on investment (ROI), internal rate of return (IRR), net present value (NPV), cash-flow analysis, and/or a 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 engineers' experience, 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, R.S. Means estimation, general contractor quotes, or other sources.
4. **Calculate energy savings performance** and cost-effectiveness of each ECM individually. For each ECM, clearly document the calculation methodology, formulas, inputs, assumptions, and sources. [PDS Section 2.5]
    - 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 an unbiased assessment of energy savings estimates.
5. **Provide a statement of the energy prices** used to establish the monetary value of the savings.

2.2 Documentation

- ECM savings results including:
    - Workbooks, spreadsheets, and other calculation tools are 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.
    - Annual projected energy savings by fuel type shall be documented in terms of energy units, a percentage of the total volume of each energy source, and cost savings using the correct marginal rate for that energy type. [PDS Section 2.8

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 related to design and construction. Still, it is important that the teams involved committing to realizing the intent of the recommended ECMs accepted by the project owner.

3.1 Procedures

1. 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 basic projects, this usually involves simple methods such as visual inspection or spot-checking system operation. [PDS Section 3.2]
    a. Develop or update an existing Systems Manual (if one exists) to document the modified systems and equipment and the process and responsibilities for addressing any future operational issues. [PDS Section 3.4]

OPERATIONS, MAINTENANCE, AND MONITORING

Good Operation, Maintenance, and Monitoring (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

- **Develop a Simple Operations, Maintenance, and Monitoring Plan** (pre-construction) that includes:
    - 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].
    - 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 behavior modifications.

4.2 Documentation

- Simple Operations, Maintenance, and Monitoring Plan.

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.

The M&V procedures for this protocol are consistent with the methods outlined in IPMVP Core Concepts Option B (Retrofit Isolation: All Parameter Measurement) or Option C (Whole Facility).

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.

The energy savings are verified by comparing the pre-and post-retrofit energy performance of the system(s) using transparent methods and metered data sources that can be verified. Open-source implementations are considered a best practice to ensure reproducibility and easy verification.

Selection of an Option B or Option C approach 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 related to the energy savings.

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 and model assumption and data is transparent to all parties in sufficient detail to enable verification.

M&V can also be conducted as part of a program, market, or another outside mechanism.

5.1 Procedures

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

1. **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.
2. Utilize programmatic M&V plan and measurement when available.
3. Conduct M&V at an hourly level when data is available.

5.2 Documentation

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

REQUIREMENTS FOR IREE CERTIFICATION

ICP's IREE certification is designed to ensure that projects are robustly engineered, and their savings predictions are reliable. To support this goal, project developer firms who submit projects seeking IREE certification must meet several 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) associated with the project development firm must sign off on a project's compliance with the ICP Protocols to be certified.

  OR

  The qualifying individual or another employee of the project developer firm seeking IREE certification must possess and demonstrate five 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 Baselining; Savings Calculations; Design, Construction & Verification; Operations, Maintenance & Monitoring; and Measurement & Verification.

These requirements are meant to serve as minimum requirements to determine the experience and capability of project developer firms implementing the Basic Protocol. 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.