**Project Feasibility Study**

*Customer Name*

*Address Street
City, CA 92867*

*Project Title – Project #*

**Prepared by:**

Implementer/Developer Name

Address City, CA 95403

Primary Contact Name

Email

Phone: xxx-xxx-xxxx

**Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| Rev | Date | Author & Organization | Summary of Changes |
| 01 | mm/dd/yyyy | Name, Title, Organization | Provide summary of changes |
|  |  |  |  |
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# **Contact Information**

|  |
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| **CUSTOMER INFORMATION** |
| **Customer Name**Customer’s Business Name | **Utility Service Account No.** 3-000-0000-42 |
| **Customer Contact**Jane Doe  | **Title**Engineer |
| **Customer Address**555 Seal Beach Blvd | **City**Seal Beach  | **State**  **Zip**CA 90740 |
| **CA Climate Zone**13 | **Telephone** 562-225-5555 | **E-Mail**jeffrey.doe@Customer.com |

|  |
| --- |
| **PROJECT INFORMATION** |
| **Project Name**Customer Building 23 |
| **Project Site Address**555 Seal Beach Blvd | **City**Seal Beach | **State Zip** CA 90740 |

|  |
| --- |
| **PROGRAM CONTACTS** |
| **Implementer/Project Mgr./Utility Eng.**Matt Clack | **Utility Program Manager**Anthony Smith | **Utility Account Representative**Jane Doe |
| **Telephone**555-202-5555 | **Telephone**626-101-5555 | **Telephone**555-303-5555 |
| **E-Mail:** johndoe@Implementer.com | **E-Mail:** a.smith@iou.com | **E-Mail:** jane.doe@iou.com |

# **Executive Summary**

The Project Developer will use this section to provide readers a high-level summary of the project drivers/challenges, recommended energy efficient measures, estimated energy savings, measure costs, peak demand reduction, critical project details, and additional benefits relevant to the customer and project scope. Project Developer shall ensure that they cover all requirements as described in the Statewide Custom Projects Guidance Document as they complete each section of this Project Feasibility Study Template.

## **2.1 Project Eligibility**

* Does the customer pay PPP charges? [ ]  Yes [ ]  No
* Does the customer have cogeneration? [ ]  Yes [ ]  No
* Renewable energy [ ]  Yes [ ]  No
* Other non-utility generation [ ]  Yes [ ]  No
* Does the customer have another form of generation? [ ]  Yes [ ]  No
* If yes, describe the cogeneration system, and complete & supply a grid impact calculation and explain how it delivers power to the equipment/system.
* Discuss any load shifting strategies are being employed (i.e. Thermal Energy Storage)

Click here to enter text.

* Discuss if the customer is participating in any Demand Response Programs
	+ If this is not applicable, state not applicable

Click here to enter text.

## **2.2 Project Drivers**

Project representative (internal IOU or external) describes the main project drivers and challenges (CPUC Staff require that assertions of program influence be backed up with supporting documentation that clearly demonstrates the implementer’s and utility’s roles in influencing customer decisions and actions on a measure level).

Program influence must include a project narrative and evidence that supports the narrative/project.

Program influence must demonstrate that the energy efficiency program motivated the customer to implement a more efficient alternative solution to the one or ones that would otherwise have been selected without program intervention. The evidence of program influence should outweigh evidence that suggests the customer would have chosen the more energy efficient alternative without program (IOU, Trade Professional, Implementer/Developer, etc.) support or financial support (audit, incentives, on-bill financing, return on investment, simple payback, etc.).

**Evidence should include copies of communications and supporting documents to and from end-use customers that document when and how the customers made their decisions, and may include, but is not limited to:**

* Screen shots of emails (we need to link IOU/implementer/developer influence on the Customer)
* Detailed and dated meeting minutes with list of attendees
* Audit reports with Financial analysis and optional comparative measures (be able to support when, how and to whom they were presented)
* Receipts/invoices for existing inventory, pictures of existing inventory
* Maintenance records, etc. (see the 14 influence drivers below)
* Eligible evidence/influence does not include:
	+ Projects submitted without documentation (evidence) that supports the Narrative
	+ Customer statement with no additional evidence
	+ Statements such as, we’ve been working with the customer for 10 years
	+ One individual email that recaps all previous meetings and discussions
	+ Evidence that does not precede the incentive application

**Best Practices**

* Every action and verbal or in-person communication should be followed up by an email with an overview of what was discussed, provided, meeting minutes, etc.
* Ask the customer to confirm via a reply with comments and questions to make sure the information was noted accurately, and nothing was missed.
* Get the Customer’s payback and business requirements for the project in writing, then ask for documentation of the leverage we applied in an attempt to influence how those requirements were met with the project.

**Please complete the narratives below. Supporting evidence should also be included with each narrative as shown below. The evidence may be supplied as an attachment(s), screen shot, or both.**

1. When and how was the original communication with the customer initiated by the IOU/implementer/developer?
	* Describe when and how the Customer was made aware of the program’s features and measures for this project.
	* Include cases of potentially negative influence including when the customer first initiated contact and why.
	* Has customer thought about potential upgrades, do they know the approximate cost to do so? Are they aware of potential utility incentives? Are they aware of the benefits (EE and non-energy)?

Click here to enter text.

[ ]  Attachment(s) [ ]  Screen shot(s) [ ]  Both [ ]  Other

1. What are the pre-existing conditions of the energy consuming systems or equipment on the customer’s facility?
	* What is the age of this equipment?
	* If the age is difficult to establish, what makes you believe you can estimate the equipment age?
	* What upgrades or component replacements have been done?

Click here to enter text.

[ ]  Attachment(s) [ ]  Screen shot(s) [ ]  Both [ ]  Other

1. Does the facility suffer from any pain points, things they don’t like, or anything they are unhappy about with their current systems or equipment?
	* Is the equipment very old or does it no longer meeting load/production? How were these issues identified?
	* Any anecdotal evidence of increased failures, low reliability, increased maintenance?
	* Does the facility need re-programming the EMS/BMS, need re-recommissioning of any systems, not bright enough, buzzing noises or flicker, need to upgrade the “image” of the space?

Click here to enter text.

[ ]  Attachment(s) [ ]  Screen shot(s) [ ]  Both [ ]  Other

1. What was the Customer planning to do prior to implementer/developer/PA intervention?
	* Business as usual (do nothing) is not assumed, in fact, the case that they were going to do something needs to be disproven, if possible.
	* Are there any facility activities triggering code enforcement requirements that could affect the project?
	* Plans to install a less efficient or less technically advanced version?
	* Has the facility upgraded similar equipment in the recent past at this site or similar facilities and what are the conditions surrounding the initiation of that project, e.g., did they pursue incentives or on-bill financing, and did they follow a deemed or custom approach?
	* For projects that were previously identified but not implemented prior to program intervention. Need to obtain the reasons why customer did not implement previously, who identified (developer/customer/vendor, name and firm name) and when.

Click here to enter text.

[ ]  Attachment(s) [ ]  Screen shot(s) [ ]  Both [ ]  Other

1. What specific recommendations were made for this project? How were they made?
	* Did the customer once partake of any “lost leader” activities offered by the PA such as measure identification, or an energy audit?
* Describe past energy savings estimates, reports, analyses, problems identified, etc. that were provided to the customer.

Click here to enter text.

[ ]  Attachment(s) [ ]  Screen shot(s) [ ]  Both [ ]  Other

1. What did the customer do after interacting with the program administrator/implementer/developer?
	* Ex. They were going to do nothing and are now going to move forward with the project.
	* Ex. They were going to do the minimum efficiency (non-incentivized measure) and were moved to install the higher efficiency (eligible) measure.
	* Describe specific discussions and dialogue on key decision points that influenced customer’s decision and enabled the customer to adopt an alternative action that improves final efficiency.

Click here to enter text.

[ ]  Attachment(s) [ ]  Screen shot(s) [ ]  Both [ ]  Other

1. Who are the Customer decision makers (company role and title) and what were the business requirements that had to be fulfilled in order for the Customer to move forward with the measure/project?
	* Financial criteria including access to financing, simple payback or ROI, bill savings, demand reduction, etc.
	* If we can identify an EE project that meets their general criteria, when would they be able to move forward? Would they find budget to do so this year? If not, would OBF allow them to implement it sooner?
* Customers with energy or carbon reduction, green or sustainability goals/plans, show how they were influenced to switch to electricity instead of gas, gas instead of electricity, or to use more water to save electricity or gas, and the net Btu reduction (3-prong test).

Click here to enter text.

[ ]  Attachment(s) [ ]  Screen shot(s) [ ]  Both [ ]  Other

1. Accelerated Replacement (AR) projects must demonstrate with a Preponderance of Evidence both that program staff convinced the customer that the project was feasible and that energy efficiency was the critical factor for pursuing the project. In other words, if not for the program the customer would not be moving forward with the project.
	* If a measure’s simple payback exceeds its [Effective Useful Life](https://www.sceonlineapp.com/SolutionCodesEUL.aspx) (EUL), the Customer should explain the reason(s) behind the business decision to implement the measure(s) even though on paper it appears that the project is not profitable.
	* If a measure’s simple payback is ≤ 2 years without incentives, financial savings should not be used as the primary influence driver.

Click here to enter text.

[ ]  Attachment(s) [ ]  Screen shot(s) [ ]  Both [ ]  Other

# **Project Details**

## **Facility Description**

Provide readers a concise and thorough overview of the site location, facility operation and general business focus.

* Climate Zone, Building Type and Description, Square Feet, Space Use
* Operating Hours - Provide Breakdown Hours/Day (M-F, and Sat-Sun)
* Seasonal off periods (maintenance/holiday shutdown)
* Production Data (if applicable)
* How the process type (steam, process heating, etc.) is utilized within the process and travels through the system
	+ Details on process operations can be provided in the appendix
* Provide a line diagram or Process Flow Diagram (PFD) to depict the facility process, equipment, and fuel use
* Include description of Non-IOU Fuel Sources

## **Energy Use Summary**

Tabulate the facility annual energy use totals for KWH, KW, and THERMS/YR as applicable

Table 3.1: Facility Annual Electric Use

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Service Account Number** | **Tariff (rate)** | **Electric Meter Number(s)** | **Annual Electrical Usage** | **Peak (max) demand (kW)** |
| xxx-xxxx-xx | TOU-8-R | xxxxxxxxx | xxxxxxxxx  | xxxxxxxxx |

Table 3.2: Facility Annual Natural Gas Use

|  |  |  |
| --- | --- | --- |
| **Description** | **Value** | **Source** |
| Gas Meter Number(s) | xxxxxxxxxxxxx | xxxxxxxxxxxxx |
| Average natural gas use over the past # years, 2012-2017, 2 months normalized to a year | ###### therms/yr | xxxxxxxxxxxxx |

## **Facility Equipment Inventory**

Provide a list of all relevant major equipment that is enclosed in the project boundary.

* Equipment Type/Capacity/Manufacturer, Loads Served, Plate Rating
* Installation Dates (i.e. In Service Years)
* Equipment Schedule - Provide Breakdown Hours/Day (M-F, and Sat-Sun)
* Detailed sequence of operation (refer reader to attachments as needed)
* Operating characteristics (efficiency, load factor, fuel usage)
* Sources for all the above data
* **DO NOT** use general language, be very specific and include diagrams to describe processes

# **Proposed Energy Efficient Measures (EEMs)**

## **EEM 1 – Name of Measure (Measure/Solution Code)**

**Measure Application Type (**Identify and justify the install type chosen for the measure)**:**

Accelerated Replacement (AR, previously RET or early retirement), Add-On Equipment (AOE, previously REA or retrofit add-on), Normal Replacement (NR, previously ROB or replace on burn-out), New Construction (NC), Building Weatherization (BW), BRO-Behavioral (BRO-Bhv), BRO-Retro-commissioning (BRO-RCx), and BRO-Operational (BRO-Op). Reference Resolution E-4818 Table 1.1.

**Effective Useful Life (EUL)/Remaining Useful Life (RUL):**

Provide the estimated EUL and source for this measure. Point out the exact DEER measure name and if varying from DEER Defaults, please provide source referenced. If non-DEER operating hours are being used, valid justification must be provided (e.g. logged data, EMS schedule) for the annual operating hours for all applicable measures. Provide RUL and calculation source if not defined by MAT.

**Standard Practice Discussion:**

Describe any applicable standard practice associated with this baseline/measure. Make direct reference to the energy codes by section and table number. It is not sufficient to state that a proposed installation is more energy efficient than a baseline measure while referencing a separate baseline document or standard practice (often proposed to be existing condition) without providing complete supporting materials and/or research.

Baselines must be well defined and describe the impact of applicable codes or standards. In situ, Code (Title 24 Section, Title 20, OSHA, AQMD, etc.), Industry Standard Practice (ISP study, other sources), where applicable. Address why all other non-applicable codes or standards are not applicable.

Provide alternative measures considered by the customer. Is there an outstanding disposition applicable to this project/measure?

Reference Resolution E-4939 and the CPUC ISP Study Guide.

**Existing Equipment/System Operation:**

Provide detailed description of the existing equipment or system operation, including location, operating hours (M-F, Sat-Sun), control method, equipment efficiency, etc.

* Utilize charts/graphs/references to present/support trend data
* Provide a picture that depicts the baseline state of the affected equipment
* **DO NOT** user general language, be very specific and include diagrams to describe processes

**Proposed Equipment/System Operation:**

Provide detailed description of the proposed equipment or system operation, including location, operating hours (M-F, Sat-Sun), control method, equipment efficiency, etc.

* Utilize charts/graphs to present trend data
* What are the less efficient alternative measures?
* Compare facility operating hours vs. impacted equipment’s operating hours
* Quantify facility usage and measure savings
* Identify and quantify interactive effects
* Provide a picture that depicts the measure
* **DO NOT** use general language, be very specific and include diagrams to describe processes

**Non-IOU Fuel Source:**

Provide detailed description of how the Non-IOU fuel source effects this measure and how the effects where accounted for in the calculations. A reference to the calculation document should be included here so it can be found and reviewed.

**Calculation Methodology:**

* If a preferred calculation tool is not utilized, the calculation methodology must be clearly and concisely documented
* Provide detail on inputs (metered data, assumptions, spec sheet)
* Complete calibration of energy simulation model
* Reference any study and data source and note all assumptions
* Include and label charts and pictures
* All custom projects must include documentation that clearly and concisely describes the calculation methodology proposed to be used to estimate the savings claims.
* Where custom spreadsheet analysis is used to estimate the expected savings impacts, the calculation methodology must be separately presented and summarized in a single place such as a clearly labeled, dedicated tab in a spreadsheet workbook or a dedicated section of a development report. It is not realistic to expect that a technical reviewer will hunt cell by cell, tab by tab through a spreadsheet to ascertain how the savings impacts are calculated.
* It is often the case that initial estimates of a custom measure’s savings impacts are performed using “placeholder” calculations which are estimates based on accepted engineering principals and assumptions, the basis of which must be clearly documented and reasonable. For many custom projects, the final savings claims estimates are based on pre-installation and post installation measurements with a savings calculation methodology that is different than the “placeholder” calculations.
* The calculation methodology description should be comprehensive and complete leaving only the final verified variables and data to be determined after project completion.
* All that should be required after the project is completed is to input final project post verified data and assumptions into the proposed formulae to determine the expected savings impacts.
* Generic methodology lacking such detailed specific associations is not acceptable
* Provide precise step-by-step calculation methodology and equations proposed to be used to estimate the expected savings impacts for each custom measure with detailed descriptions associating the proposed methodology with specific equipment and systems affected by the measure. The methodology must be logically organized
* When pre or post installation measurement and verification is proposed or required, the calculation methodology must describe in detail how the pre and post project measurements (will be used to estimate the expected savings impacts for this measure.
* Provide system diagrams to facilitate the review of the measure
* The energy savings principle for each measure should be discussed
* Provide concise equations with explanations demonstrating how the final savings estimates will be determined using the measured data.

**Estimated Savings:**

These savings estimates are only the savings for which the customer may receive incentives for

|  |
| --- |
| **EEM 1 – Name of Measure (Solution/Measure Code) Estimated Energy Savings** |
| Electricity Savings | **1,500,000 kWh** |
| Electric Peak Demand Savings | **20 kW** |
| Natural Gas Savings | **100,000 Therms/yr** |

# **Project Cost & Financial Analysis**

Provide a table (suggested format below) that details project cost estimates and sources of those estimates. Implementer to discuss and identify with customer the appropriate financial analysis (payback, NPV, as applicable) and detail the source of any assumptions.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **Annual Estimates** |  |  |  |  |  |  |  |  |  |  |
| **EEM No.** | **Measure Description****(with Solution Code)** | **Measure Type** | **ElectricitySavings (kWh)** | **Electricity Savings (kW)** | **Gas Savings****(therms/yr)** | **Cost Savings** | **Estimated Installation Cost (GMC)** | **Estimated Incremental Cost (IMC)** | **Standard Measure Cost (SMC)** | **Estimated Accelerated Replacement Cost (ARC), for AR installation type only** | **Potential Utility Incentive** | **Effective Useful Life (EUL)** | **Remaining Useful Life (RUL), for AR installation type only** | **Estimated Payback (Years) no incentive** | **Estimated Payback (Years) with incentive** |
| EEM-1 | Lighting Upgrade(xx-12345) | NR |  |  |  |  |  |  |  |  |  |  |  |  | 2.25 |
| EEM-2 | Chiller Upgrade(xx-12345) | AR |  |  |  |  |  |  |  |  |  |  |  |  | 1.75 |
| **Sources** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **TOTAL (ALL MEASURES)** |  |  |  |  |  |  |  |  |  |  |  |  |  |

\*The project developer should use the incentive rates currently being offered through the qualifying program in which incentives are being applied for.

# **Measurement and Verification Plan**

The M&V plan shall include a measure installation verification plan. The objectives of measure installation verification plan are to confirm that: (1) the measures were actually installed, (2) the installation meets reasonable quality standards, and (3) the measures are operating correctly and have the potential to generate the predicted savings.[[1]](#footnote-1) Verification activities shall be conducted during on-site visits, however, virtual methods may be utilized, in situations where a site visit is impractical due to post-installation measurement not requiring a site visit. Pre and/or post installation measurements of equipment performance are conducted to reduce uncertainty in project savings and are included by project developer or program implementer; or requested by the program administrator on an as-needed basis as part of the project development and review process.

**Recommendations for M&V activities for Very Low Rigor Tier (Incentive ≤ $7,500) projects**

**Installation Verification.** Installation verification activities for Very Low Rigor Tier projects may generally consist of visual equipment verification and gathering of any readily available data. Since the cost of scheduling and conducting a site visit typically approaches or exceeds the 10% of the incentive amount, virtual methods may be the preferred method for conducting installation verification if those methods have been demonstrated to be reliable for the measures in the project.

Installation Verification Requirements:

* Itemized Paid Invoice of installed equipment
* Photo image of installed equipment including location and surrounding conditions with Geotagging if permitted by customer. The photos should strive to ascertain information such that adequate measure installation and installation quality can be assessed for the purpose of achieving energy savings.
* Photo image of the name plate of the installed equipment (i.e. manufacturer, model number, serial number, year built, etc.) if safely accessible
* Updated image of affected system/line diagram/control screens, if available and applicable
* Verify production, occupancy, or other key variables with customer or project sponsor email.
* Verify hours of operation with customer or project sponsor email.
* Product specifications or other product performance data when readily available and applicable to the savings methodology. If ratings or specifications applicable to the savings calculation but not available, a justification for not performing any verification measurements must be supplied and approved before the use of stipulated/assumed performance values can be utilized. Some examples include:
	+ DLC Screenshot (if DLC listing is required) and manufacturers specification showing the kW and/or efficacy (LED lighting),
	+ AHRI Rating (refrigeration and cooling compression),
	+ CAGI (air compressors)
	+ NEMA (motors)
	+ NFRC (windows and glazing measures)
* Verify the removal of or an abandonment[[2]](#footnote-2) in place of the replaced measure if it is a retrofit

**Performance Measurements.** Pre and/or post equipment performance measurements for Very Low Rigor Tier projects are generally not required when stipulated values are previously approved and manufacturers specification are based on results from independently performed industry accepted testing for the specific equipment of equipment family. A short video can be helpful to show fluctuating operation such as a VFD or cycling air compressor depending on the measure and calculation methodology.

Very Low Rigor Tier projects with large savings uncertainty or large market potential or in the case that the total number of such projects planned or expected in a 12-month period will place the total incentive for all projects into another rigor level, that other rigor level shall apply. If the measure under consideration has a large market potential thus there are many future projects projected, the cost of the required M&V activity for a sample of projects representing the expected variation of performance based on site specific conditions can be spread over multiple project submissions. When performance measurements are proposed, an M&V plan compliant with the Statewide Custom Projects Guidance Document must be submitted.

**Recommendations for M&V activities for Low Rigor Tier ($7,500 < Incentive < $25,000) projects**

**Installation Verification.** The requirements and suggestions listed for the Very Low Rigor Tier projects are applicable to the Low Rigor Tier projects.

* Itemized Paid Invoice of installed equipment
* Photo image of installed equipment including location and surrounding conditions with Geotagging if permitted by customer. The photos should strive to ascertain information such that adequate measure installation and installation quality can be assessed for the purpose of achieving energy savings.
* Photo image of the name plate of the installed equipment (i.e. manufacturer, model number, serial number, year built, etc.) if safely accessible
* Updated image of affected system/line diagram/control screens, if available
* Verify production, occupancy, or other key variables with customer or project sponsor email and verify if possible with utility meter/billing/AMI data.
* Verify hours of operation with customer or project sponsor email and verify if possible with utility meter/billing/AMI data.
* Product specifications when readily available and applicable to the savings methodology. If ratings or specifications applicable to the savings calculation are not available, a justification for not performing any verification measurements must be supplied and approved before the use of stipulated/assumed performance values can be utilized. Some examples include:
	+ DLC Screenshot (if DLC listing is required) and manufacturers specification showing the kW and/or efficacy (LED lighting),
	+ AHRI Rating (refrigeration and HVAC equipment),
	+ CAGI (air compressors)
	+ NEMA (motors)
	+ NFRC (windows and glazing measures)
* Verify the removal and legal disposal/recycling of the replaced equipment or an abandonment in place of the replaced measure, if it is a retrofit.
* Verify control strategy to determine if the replaced equipment operates only as a back-up.

**Performance Measurements.** Pre and/or post equipment performance measurements for Low Rigor Tier projects shall be proposed by the project developer, program implementer or requested by program administrator to reduce uncertainty in the project savings estimates. The requirement may be reduced when the primary uncertainty arises from stipulated values and those values are previously approved and manufacturers specifications are based on results from independently performed industry accepted testing for the specific equipment of equipment family. Typical performance measurement activities for Low Rigor Tier projects consist of the following activities:

* Control system screenshots used to verify operational parameters such as control setpoints, operating hours equipment sequencing and so on.
* Spot measurements or pre- and/or post- installation short-term data logging of installed or affected equipment/system energy consumption, operation, or other key variables.

The project developer and technical reviewers shall consider the value of this effort in terms of the increased accuracy of the energy savings estimates when determining if this is a beneficial effort considering M&V budget constraints. Low Rigor Tier projects with large savings uncertainty or in the case that the total number of such projects planned or expected in a 12-month period will place the total incentive for all projects into another rigor level, that other rigor level shall apply. If the measure under consideration has a large market potential and thus there are many future projects projected, the cost of the required M&V activity for a sample of projects representing the expected variation of performance based on site specific condition may be spread over multiple project submissions. When performance measurements are proposed, an M&V plan compliant with the Statewide Custom Projects Guidance Document must be submitted.

**Recommendations for M&V activities for Medium and Large Rigor Tiers (Incentive > $25,000) projects**

**Installation Verification.** The installation verification requirements and suggestions listed for the Very Low and Low Rigor Tiers projects are applicable to the Medium and Large Rigor Tiers projects. Site inspections to conduct installation verification are preferred over virtual inspections when conditions permit.

* Itemized Paid Invoice of installed equipment
* Photo image of installed equipment including location and surrounding conditions with Geotagging if permitted by customer. The photos should strive to ascertain information such that adequate measure installation and installation quality can be assessed for the purpose of achieving energy savings.
* Photo image of the name plate of the installed equipment (i.e. manufacturer, model number, serial number, year built, etc.) if safely accessible
* Updated image of affected system/line diagram/control screens, if available
* Verify production, occupancy, or other key variables with customer or project sponsor email or interview and verify with utility meter AMI data if possible and not verifiable through other M&V data
* Verify hours of operation with customer or project sponsor email or interview and verify with utility meter AMI data if possible and not verifiable through other M&V data

Verify the removal and legal disposal/recycling or an abandonment in place of the replaced measure if it is a retrofit.

* Verify control strategy to determine if the replaced equipment operates only as a back-up.

**Performance Measurements.** Pre and/or post equipment performance measurements for Medium and Large Rigor Tiers projects shall be proposed by the project developer unless the CPUC staff has pre-approved that all measures included in the project using the proposed calculation methodology and stipulated values, are exempt from either pre or post- (or both) performance measurements. If Pre- and/or Post- performance measurements is proposed to not occur an explanation of the rationale for iexcluding performance measurements from the project development process shall be required; such a proposal shall require pre-approval. An M&V plan compliant with the Statewide Custom Project Guidance Documents must be submitted for all projects were M&V will be conducted. The M&V plan must provide the following:

* The IMPVP Option used to determine savings
* Identification of project boundaries of the energy efficiency measure
* Data to be collected and/or measured
	+ Specify location of metering points on a line diagram
	+ Discussion of how the data will be used in the calculations
* Specifications of measurement equipment, period (i.e. 2 weeks), and interval (i.e. 15min increment)
	+ Discussion of the accuracy of the measurement equipment
	+ Include no less than 2 weeks of metered data (pre- and post-)
	+ Discussion of capturing seasonality (i.e. harvest) in metered data
* Specifications of the exact data analysis procedures, algorithms, assumptions, software tools (name and version)
	+ Reference relevant sections of energy efficiency standards or guides used for assumptions
* How the results will be reported and documented
	+ Discussion of uncertainty associated with the results

# **Maintenance Plan**

All BRO (Retrocommissioning and Operational) projects require a three-year maintenance plan or service contract at IR. Additionally,Retrocommissioning and Operational projects must use a three-year EUL. Behavioral projects are not currently eligible for incentives.

* The BRO (formerly known as RCx) Vendor must provide a maintenance plan for the duration of at least three years for the incentivized measure(s).
* The Customer must supply evidence of the training taking place for a maintenance plan for the duration of at least three years for the incentivized measure(s).
* When building staff is not available or trained to perform maintenance tasks, owners may have a maintenance service contract in place with an equipment vendor, installing contractor, or a maintenance service contractor - at which time it becomes a Service Contract.
* Most companies providing service contracts focus on maintenance of equipment, and building owners and managers need to specifically request requirements that address operating issues in service contracts.
* If included in the Retrocommissioning Plan, the commissioning team can review any existing service contracts and make recommendations on how to enhance the current level of service to address efficient operation.
* The maintenance plan or service contract must be submitted during Implementation Review and Approval.
* Up-to-date building documentation, including O&M Manuals, Sequences of Operation, and System Diagrams, are produced through the retrocommissioning process and are essential to maintaining and troubleshooting equipment. The Preventive Maintenance Plan and a Recommissioning Plan should describe in detail the human and financial resources that are necessary to maintain the benefits of the retrocommissioning process for many years.

# **Project Parameters for Utility Energy Efficiency Programs**

Implementer to provide project reporting and technical parameters for each measure (measure/solution code) that is part of the submitted application for utility incentive.

|  |  |  |  |
| --- | --- | --- | --- |
| **EEM** | **1**  | **2**  | **3**  |
| **Site # / SA Number** | Site Identifier | Site Identifier | Site Identifier |
| **Utility Solution/Measure Code** | PR-78584 | PR-78584 | PR-78584 |
| **Measure Description** | High efficiency process chiller | High efficiency process chiller | High efficiency process chiller |
| **MAT** | NR | NR | NR |
| **Standard Practice Applicable** |  |  |  |
| **EUL (years)** | 20 | 20 | 20 |
| **RUL (years)** | N/A | N/A | N/A |
| **EUL Source** |  |  |  |
| **EUL Justification** |  |  |  |
| **Facility Usage** | **kWh** |  |  |  |
| **kW** |  |  |  |
| **Therms/yr** |  |  |  |
| **1st Period Baseline Usage** | **kWh** | 4,419,631.80 | 4,419,631.80 | 4,419,631.80 |
| **kW** | 1,096.40 | 1,096.40 | 1,096.40 |
| **Therms/yr** |  |  |  |
| **2nd Period Baseline Usage** | **kWh** |  |  |  |
| **kW** |  |  |  |
| **Therms/yr** |  |  |  |
| **Measure Usage** | **kWh** | 3,115,476.40 | 3,115,476.40 | 3,115,476.40 |
| **kW** | 880.76 | 880.76 | 880.76 |
| **Therms/yr** |  |  |  |
| **1st Period Savings** | **kWh** | 1,304,155.40 | 1,304,155.40 | 1,304,155.40 |
| **kW** | 215.64 | 215.64 | 215.64 |
| **Therms/yr** |  |  |  |
| **2nd Period Savings** | **kWh** | - | - | - |
| **kW** | - | - | - |
| **Therms/yr** |  |  |  |
| **Gross Measure Cost [GMC]** | $1,500,000.00 | $1,500,000.00 | $1,500,000.00 |
| **Standard Measure Cost [SMC]** |  |  |  |
| **Incremental Measure Cost [IMC]** | $638,000.00  | $638,000.00  | $638,000.00  |
| **Accelerate Replacement Cost [ARC]** |  |  |  |
| **Cost Documentation [GMC]** | Describe Cost Estimate Reference  | Describe Cost Estimate Reference  | Describe Cost Estimate Reference  |
| **Cost Documentation [SMC]** |  |  |  |
| **Cost Documentation [IMC]** | Describe Cost Estimate Reference  | Describe Cost Estimate Reference  | Describe Cost Estimate Reference  |
| **Total Estimated Savings** | **kWh** |  |  |  |
| **kW** |
| **Therms/yr** |
| **Total GMC** |  |  |  |

# **Appendix**

Implementer shall include as an attachment any of the following applicable files (check appropriate box(es)):

[ ]  Comprehensive Existing System/Equipment Performance Data and operating conditions

[ ]  Photos of system/existing equipment

[ ]  Schematic/Diagram for existing system

[ ]  Proposed Equipment Spec Sheet (if applicable)

[ ]  Schematic/Diagram for proposed system

[ ]  Equipment schedule of proposed system/equipment and/or load balance

[ ]  Cost proposal for proposed equipment and installation

[ ]  Energy models

* + All whole building energy models **must** be calibrated to utility bills
	+ Provide paper and electronic copy of input files, output files, and reference to weather files
	+ Note what input parameters were measured and which were assumed by providing sources
	+ Report the accuracy with which the simulation results match the energy data used for calibration

[ ]  Production Data (if applicable)

Additional attachment(s), describe in full

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1. California Evaluation Framework p.161.

<https://www.cpuc.ca.gov/-/media/cpuc-website/files/uploadedfiles/cpuc_public_website/content/utilities_and_industries/energy/energy_programs/demand_side_management/ee_and_energy_savings_assist/caevaluationframework.pdf> [↑](#footnote-ref-1)
2. Requires PA pre-approval on a case-by-case basis. [↑](#footnote-ref-2)