



RETROCOMMISSIONING IMPLEMENTATION GUIDELINES

San Diego Retrocommissioning Program

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Overview

The Program allows flexibility in how the Owner wishes to implement the selected measures. For instance, the Owner may utilize in-house building staff, hire the RCx Provider to implement or provide technical assistance, contract with outside service contractors, or any combination of the above.

The Owner will be required to use their own funds to implement measures that pay back in one year or less. For selected measures that exceed a one-year simple payback, PECI will negotiate an incentive (see section below) to assist the Owner with implementation. In order to receive the implementation incentive payment, the Owner must provide evidence of implementation of all selected measures to PECI by the date set forth in the *Implementation Incentive Offer* signed between PECI and Owner.

The *RCx Investigation Report* developed by the RCx Provider provides some detail and recommendations for the Owner's reference if specifying the implementation tasks to staff or contractors. Prior to starting implementation, the RCx Provider will review any contractor bids, ensuring that the contractor scopes of work adequately reflect the intent of the recommendations in the *RCx Investigation Report* and include verification of performance sufficient for Program requirements. If needed, the RCx Provider will answer questions that arise during implementation and provide clarification or advice on measures being implemented. Any technical or management assistance beyond these tasks may be contracted between the Owner and RCx Provider, and is highly recommended and encouraged for more complex measures. Any additional assistance proposed by the RCx Provider should be clearly indicated as being optional.

Using the Findings Workbook and program database, the RCx Provider reports monthly on the progress of each measure until implementation is complete. If needed, the RCx Provider attends implementation progress meetings with the Owner and a PECI Program Representative to discuss implementation actions taken to-date and resolve any issues that have arisen.

The RCx Provider verifies completion of each measure and updates the Findings Workbook with final implemented measures including final savings, costs, and payback calculations to produce the *Implementation Summary Table* (included in the Findings Workbook). To support the *Implementation Summary Table*, all measures must have verification data, invoices, estimates of in-house labor if used for implementation, and, where applicable, updated savings calculations. When feasible, verification data should include trends or functional test results, though other methods such as copies of invoices, site visit reports, and before/after photos may be acceptable.

Once implementation is complete, the PECI Program Representative conducts a final site visit and hands off the ENERGY STAR® account (created as a part of the candidate screening with the pre-implementation score) to the building Owner. Emphasis is placed on how to manage the account so that a new energy performance rating can be generated to reflect the operational status of the building 12 months post-project completion (or near Program end).

1.0 Incentives

Measures that pay back in greater than one year and less than four years are eligible for implementation incentives under the Program, estimated at \$0.05 per square foot, to buy down the measure simple payback to one year. Measures that pay back in greater than four years are treated on a case-by-case basis and will be eligible for incentives if the measure meets the Program cost-effectiveness criteria and is a higher-persistence measure (such as deeply-embedded controls programming changes or pump impeller trims).



If the measures that have a one year or less payback are not fully covered by the Owner's incentive cap, the Program will review the remaining measures on a case-by-case basis to evaluate if these can be covered by the balance of the incentive money for the project.

To provide motivation for Owners to proceed through implementation quickly, the Program may offer an implementation bonus. The bonus will be calculated at \$0.005 per kWh saved from the project and available if the Owner completes implementation (defined by PEGI approval of the *Implementation Summary Table*) on an accelerated timeline. To receive the bonus, a minimum of 30% of the project kWh needs to be achieved within three months. The bonus will be prorated based on the percentage level of savings achieved by the due date. The Program will offer this incentive until it is determined that this is either not financially viable, or is no longer required.

For purposes of the bonus and/or to realize quick energy savings, the Program may, on a case-by-case basis, split each project into no more than two sets of measures that will be tracked as two separate subprojects. The bonus will be based upon the subproject that meets the bonus guidelines. Verification and QA for each subproject will need to be completed before that subproject will receive incentives.

To confirm the assigned implementation incentive, implementation bonus (if applicable), and the timeline to which the Owner must adhere to receive the incentives, an *Implementation Incentive Offer* is signed between the Owner and PEGI prior to the start of implementation.

Upon approval of the *Implementation Summary Table*, and satisfaction that the agreed-upon measures were implemented and verified properly, the implementation incentive will be paid directly to the Owner. If an implementation bonus was negotiated and the conditions were met, it is also paid at this time.

A portion of the follow-up incentive is designated for the RCx Provider to be available to answer Owner or contractor questions regarding measures being implemented and to ensure that the Program's reporting and verification requirements are fulfilled. Upon approval of the *Implementation Summary Table*, supporting verification data, and updated savings calculations, 50% of the follow-up incentive will be paid to the RCx Provider.

2.0 Deliverables

Under the Program, there are two key deliverables during the RCx implementation: *Implementation Progress Reports* and the *Implementation Summary Table*. As described in the RCx Investigation Guidelines, these deliverables are part of the Microsoft Excel® Findings Workbook provided to the RCx Provider. The two deliverables are described in detail below.

2.1 *Implementation Progress Reports*

To ensure that projects are on schedule to meet the Program's requirements, an *Implementation Progress Report* must be submitted monthly and updated through the Findings Workbook during implementation (via the program database). The *Implementation Progress Report* worksheet in the Findings Workbook is set up to provide a quick update on each measure's Scheduled Completion Date, Completion Date, and Actions Taken to-date. These fields are auto-generated in the Implementation Progress tab from the Data Input tab.

It is very important that the Actions Taken to-date are regularly logged and that any issues or barriers to implementation are identified as quickly as possible. PEGI will review the Progress Reports and be available to help resolve any issues during implementation. If warranted, the Owner, a PEGI Program Representative, and the RCx Provider should meet to discuss and resolve any issues that have arisen.



2.2 Implementation Summary Table

In order for the Owner to receive the full RCx implementation incentive payment and the RCx Provider to receive 50% of the follow-up incentive, an *Implementation Summary Table* must be submitted by the date agreed to in the *Implementation Incentive Offer* signed between the PEGI and Owner. The *Implementation Summary Table* is a worksheet in the Findings Workbook and contains the following information for all measures implemented:

- Measure
- Updated annual electric savings (kWh and \$)
- Updated annual gas savings (therms and \$)
- Updated annual total savings (\$)
- Updated peak demand savings (kW)
- Actual implementation cost (\$)
- Updated simple payback (years)
- Final Program incentive (\$)
- Updated Simple Payback with Incentive (years)
- Evidence of Implementation: Method
- Evidence of Implementation: Results

These fields are defined further in the instructions in the Findings Workbook.

2.2.1 Implementation Verification

The Program is a verified energy efficiency savings program funded by California ratepayers and administered by Southern California Edison under the auspices of the California Public Utilities Commission. Therefore, all projects will be subject to careful scrutiny by SDG&E and an independent EM&V contractor to evaluate the Program. It is imperative that every project have appropriate pre-implementation baseline data and post-implementation evidence showing that measures were implemented.

The *Implementation Summary Table* must be supported by evidence that the measure was implemented and, where applicable, that acceptance criteria were met. Measure-specific guidelines and examples for implementation verification are included in the *Documentation Guidelines*. Acceptable methods for verifying implementation, where applicable and in order of preference, include:

1. Gather and analyze trend data. Wherever possible, the format of the verification data should align with the baseline data submitted and approved during the RCx investigation. Trend data should show system functioning in each operating mode and over a sufficient range of operating conditions, to demonstrate that the measure has been implemented and the system is functioning as expected. Measures related to controls resets must use this method wherever possible.
2. Functional performance test, documented with a form. A blank template functional test form, including instructions and an example, is available at the RCx Program website under Provider Resources (see www.sandiegorcx.com, username/password “rcxprovider”). Example functional test forms for many RCx measures are available on-line at ftguide.org.
3. Screen shots of system operation at multiple operating conditions. Screen shots should show both output (commanded state) and input (status feedback) wherever available.
4. Screen shots of control logic that show all relevant operating conditions.
5. Before and after photos of visual measures (e.g. lighting or air leakage). Make sure the camera’s date/time are set correctly.



The last two only apply to measures with savings of less than 25,000 kWh/year or measures that cannot be readily trended by any means (e.g., leakage).

The program will grant exceptions when there are significant problems in getting the data (e.g., the customer's chiller can't be shut down to setup the logger). These circumstances must be documented and, in these cases, conservative values should be used as a proxy for the trended value.

Copies of itemized invoices for each measure must also be submitted, indicating installation date, installer company info, installed equipment/procedure, and cost. If in-house labor was used for implementation of a measure, and estimate of the number of in-house hours utilized must also be provided.

Prior to the start of verification PEGI will facilitate an *Implementation Verification Planning Meeting* with the RCx Provider, Project Coordinator, and PEGI Engineers to discuss and establish the appropriate verification approach, based on the guidelines provided above, for each project.

See section 5.3 of the *Investigation Guidelines* for additional general measurement guidelines related to implementation verification.

2.2.2 Updated Savings Calculations

Similarly, it is important that the savings calculations performed during the RCx investigation are updated post-implementation. The updated savings fields in the 'Data Input' tab in the Findings Workbook should incorporate modifications to the engineering calculation or model used to estimate savings:

- To include interactive effects between the measures that have been implemented
- To reflect the actual scope of the implementation of the measure (e.g., four pump impellers were trimmed instead of three; economizer upper limit set to 65°F rather than a two degree differential from return and temperature).

Beyond those circumstances, Providers may also update the savings calcs if they notice a difference between investigation-phase assumptions and post-implementation trend data. Any differences in savings between the investigation-phase calculations and the post-implementation calculations must be documented.