

# Continuous Optimization Program

## Recommission Your Building—service provider scope of work

### FROM THE C.OP “RECOMMISSION YOUR BUILDING” AGREEMENT:

#### 4. Service Provider Scope of Work

This Scope of Work sets forth the professional services and technical assistance the Service Provider will supply for the BC Hydro Continuous Optimization Program.

If the Applicant has entered into a prior Program Services Funding for Commercial Buildings Agreement with

BC Hydro (the “First Agreement”), any historical continuous optimization project documentation from activities undertaken under that First Agreement will be used to guide activities under this Agreement. The Applicant acknowledges and agrees that ascertaining the condition of, and re-establishing the successful operation of previously installed measures under the First Agreement (the “Round 1 Measures”) is an important aspect of matters undertaken under this Agreement. The Applicant will report to BC Hydro on all Round 1 Measures in its reporting under this Agreement. If Round 1 Measures are no longer operational, the cost of re-establishing the Round 1 Measures may be included as part of the Bundle of Measures contemplated under this Agreement.

##### 4.1 Investigation Phase

The Service Provider will conduct a rigorous and comprehensive on site investigation and analysis of the building operations, seeking to identify deficiencies and potential optimization in the operation of the building energy consuming systems and related controls. Although the identification of major retrofits is encouraged, the goal of the Program is to optimize existing equipment with minimal repairs and upgrades.

The tasks include, without limitation:

- (a) arrange a kick-off meeting with the Applicant and appropriate facility staff to discuss any facility access and security issues, and to communicate the approach for the investigation process, including data acquisition. Coordinate the meeting with BC Hydro’s Program Representative.
- (b) gather information to define the Facility’s Owner’s Operating Requirements (OOR), including operational schedules, implementation limitations, etc. (template provided by the Program). Gather operational and maintenance information (template provided by the Program). Gather facility documentation (plans, equipment schedules, schematic flow diagrams, specifications, equipment lists etc.) to help understand the original design intent and it’s relevancy to the Applicant’s current operating requirements.
- (c) investigate, and analyze the general types of systems:
  - (i) Central Plant(s) including the following general types of equipment:
    - Chillers
    - Cooling towers
    - Boilers
    - Pumps
    - Control systems

- (ii) Central Air Handler(s)
  - Fans
  - Chilled water coils and valves
  - Hot water coils and valves
  - Dampers
  - Control systems, including VFDs and outside air and economizer control
  
- (iii) Zonal HVAC
  - HVAC delivery to the space (air and/or water distribution, whether dual duct, VAV terminals with re-heat, hydronic, etc.)
  - Control systems for HVAC delivery and zonal temperature control
  
- (iv) Major Unitary Systems
  - Water source heat pumps
  - Rooftop package units (15 tons or over)
  - Controls
  
- (v) Lighting Systems
  - Interior lighting controls
  - Exterior lighting controls
  
- (vi) Refrigeration Systems
  - Controls
  
- (vii) Domestic Hot Water Systems
  - Heaters/boilers
  - Controls

For similar equipment having similar operating schedules and serving similar occupancy types, sampling may be used for purposes of problem identification and baseline documentation/data collection (for sampling procedures see the Investigation Guidelines provided by the Program).

- (d) gather operational and functional performance data to assess equipment operation and to identify deficiencies and measures for improvement. Gather data to quantify building operation, and deficiencies using the appropriate methods for the building including the building automation system to trend data, monitoring with portable data loggers, and on-site measurements. Obtain baseline data for identified measures, according to the Program's Documentation Guidelines provided by the Program for Optimization Measures. Any costs associated with this process are the responsibility of the Applicant.
- (e) track investigation activities using the Findings Workbook provided by the Program and report progress to BC Hydro and the Applicant (bi-monthly during investigation).
- (f) use engineering calculations or simulation models to estimate the potential energy and demand impacts of implementing the identified measures for each utility (electricity, gas, steam, etc.), according to the Program's Documentation Guidelines.
- (g) record and track investigation findings using the Findings Workbook. From the Findings Workbook, produce a Master List of Findings, including potential measures for implementation, energy savings, estimated implementation costs, and initial payback calculations.

- (h) submit Master List of Findings to the BC Hydro Program Representative. Support each finding with data that clearly indicates the deficiency or problem, including engineering calculations, trend or portable logger data plots and files, functional test results, site visit reports, and photographs, as appropriate. These should be generated during the investigation process.
- (i) meet with the Applicant and the BC Hydro Program Representative to present the Master List of Findings, and assist the Applicant in selecting measures for implementation.
- (j) using the Program's template, produce the RCx Investigation Report, further detailing the actual measures that were selected for implementation. The RCx Investigation Report should provide information to assist the Applicant with implementation, including: recommendations for how to implement the selected measures, budget estimates or bid costs from contractor(s) for the selected measures, proposed Service Provider assistance (if chosen by Applicant), and the appropriate methods for verifying measures are operating as intended (refer to Documentation Guidelines).

#### **4.2 Implementation Phase**

Note: Program funding is not available for activities undertaken during the Implementation Phase.

- (a) the Service Provider shall develop an Implementation Plan, to establish the level of additional Service Provider assistance desired or warranted for each potential measure. Additional implementation assistance may include: preparing detailed scopes of work, writing detailed control sequences and schematics, working with in-house staff to implement and optimize measures, or providing full turn-key implementation services. As appropriate, total estimated costs should detail out Applicant contractor costs and Service Provider implementation assistance costs. It is encouraged that the basis for cost calculations be documented.
- (b) prior to work starting, review the contractor bids ensuring that the contractor scope of work adequately reflects the intent of the original recommendations developed by the Applicant and Service Provider, and include verification of performance sufficient to meet the Applicant's requirements for proof of improvement. If needed, answer questions that arise during implementation and provide clarification or advice on measures being implemented.
- (c) provide field review for all implemented conservation measures.

#### **4.3 Completion Phase**

The tasks for the Completion Phase include, without limitation:

- (a) verify completion of each measure and update Findings Workbook with final implemented measures including final savings, costs, and payback calculations. To support the Implementation Summary Table (included in the Findings Workbook), selected measures with significant savings potential should have verification data demonstrating that the measures are operating as intended along with 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.
- (b) conduct an in-house training presentation for the Applicant and the appropriate building operations personnel covering the new documentation, measures that were implemented, and requirements for ongoing maintenance and monitoring. Document the attendance of the building operations staff.
- (c) submit a Training Completion Form according to the Documentation Guidelines.
- (d) submit the Field Review Report to document the implemented measures, including, but not limited to: date of completion of each measure, new or improved sequences of operation, the energy savings impact of the measures, the requirements for ongoing maintenance and monitoring of the measures, and contact information for the Service Provider, in-house staff, and contractors responsible for implementation.