

ESCO SUPPORT SERVICES

When ESCO's project development and sales teams are faced with a compressed PC project development schedule, EBCx Services provides technical support to assist. ESCO's project development workload can ramp up quickly, creating a challenge to provide enough in-house resources to effectively handle the field work and associated reporting/deliverables that are required for success.

To effectively move a challenging project forward to the next step and final award, carefully planned resource allocation and project development planning is critical for success. Working as a sub-consultant member of the project development team, EBCx Services provides technical support from the initial preliminary assessment through the IGA level stage. EBCx Services works with your team to help "expand the bench" during periods of heavy resource demand.

Additionally, EBCx Services provides Project Management, Commissioning and TAB support during the construction phase, and when required, M&V support post construction. The type of assistance that we provide during each phase is listed below:

Please note that work can be adjusted to accommodate specific project or process requirements, including a targeted approach of areas such as large scale RCx initiatives or central chilled water plant upgrade

Preliminary Assessment (PA) Phase:

- Review available as-built drawings to understand general equipment/systems in each building.
- Perform a cursory review of available BAS graphics for each building and obtain screen shots to obtain a high-level understanding of the control system structure and identify possible issues that drive energy waste. Trending and storage capability of the BAS will be identified. Additionally, if critical points are not available on the BAS, it will be noted where localized use of data loggers will be required during the IGA phase.
- Perform a site survey of each building to obtain the necessary information to write a report of the as-found data including: onsite utility meters, generators, HVAC equipment/systems, control system, and general retrofit opportunities for mechanical and control system. *If the building does not require mechanical or control retrofits, opportunity for RCx will be identified.*
- Meet with the Facility Manager to understand facility use, occupancy, scheduling and any widespread or ongoing general issues including indoor air quality, comfort, and reliability concerns.
- Write a report for each building that summarizes the existing conditions and recommended ECMs. HVAC related ECMs will include both mechanical retrofits/upgrades and control system modifications that yield maximum energy cost savings.

IGA Phase:

- Based upon the list of potential ECMs identified during the PA Phase, EBCx Services will develop a Performance Testing Plan (PTP) for each building that describes the technical testing approach for the IGA level work. The PTP includes where the BAS will be used to setup/store trends. Points required that are not available through the BAS will be recorded using data loggers.
 - EBCx Services owns over 100 data loggers for temp, rh, lighting, plus dozens of additional logging accessories for amperage, voltage, kW, static pressure, air particle size and count, CO2 and CO.
- The PTP will leverage the BAS as much as possible to establish a baseline of how equipment and systems are operating. Trends are used to establish set points, schedules and various control issues such as simultaneous heating/cooling and if economizers are operating correctly (depending on weather conditions). Additionally, screen shots will be captured at various times of the day to establish a baseline of performance. Each ECM is backed up by a combination of field testing, BAS or data logger trends. Copies of all trends and screen shots are included in the workbook, identified by number to match up with each ECM.
- kW, volts, amps, and pf are measured on all motors 5 HP and larger.
- Meet with the Facility Manager to fully understand facility use, occupancy, scheduling and any widespread or ongoing general issues including IAQ concerns. During this meeting, we sit down with the FM and develop a zone by zone schedule to understand when areas of the building are occupied and if any wide spread comfort issues exist. Use of space heaters is identified.
 - Indoor Air Quality (IAQ), comfort and reliability concerns are documented. Measures that are of a high priority that do not carry energy cost avoidance will be described in the final workbook (deliverable)
- When required in the PTP, AHU airflow rates are measured to determine ventilation flow, min/max flow on vavs (generally a statistical sample rate as per FEMP guidelines). Additionally, field testing of DAT, Discharge Duct Static Pressure are measured and compared to the BAS for accuracy. Low DAT and high duct static pressures are often discovered that lead to low cost, high energy saving ECMs.
- When required in the PTP, chiller kw/ton efficiency is field tested, including waterflow using various testing methods including ultrasonic water flow testing.
 - When required in the PTP, hydronic flow and pressure testing will be performed.
- When required in the PTP, boiler combustion efficiency is field tested at various firing rates.
- Motor and equipment tag data is recorded.
- Issue log is developed indicating O&M measures and any deferred maintenance issues. Based on ESCO and customer requirements, a “Quick Fix” repair budget by building will be established.



- Recommended ECM list is developed, including a recommended M&V approach for each ECM.
- All field testing is recorded in an Excel workbook, which when completed, has all recommended ECMs, including recommended control sequences and an issue log generated through the site investigation/testing work. The workbook is used to calculate energy savings or an energy model.
- EBCx Services works with the ESCO's energy engineer or energy modeler to clarify any field data that was provided as inputs for the energy calculations, and to answer any specific questions about general building operation and discovered issues that may impact the energy model.
- Scope of Work (SOW) documents are developed, and include adequate detail, sketches and submittal data to allow contractors to provide fixed pricing on recommended ECMs.
- When the SOW requires TAB, Cx or RCx, EBCx Services will provide firm construction phase pricing to perform this work.

Construction Phase:

- Project Management support
- Testing, Adjusting and Balancing (TAB) when required in the SOW
- Existing Building Commissioning (EBCx) when required in the SOW
- Maintain Issue Log and perform "Quick Fix" repairs as specified in the SOW
- Commissioning of ECMs to verify that the estimated energy savings are achieved.
- Training support
- M&V support