

Memorandum

To: Illinois SAG CHP Sub-Committee
 Randy Gunn, Managing Director Navigant
 Rob Newman, Associate Director, Navigant

From: Roger Hill, Managing Consultant, Navigant

Date: July 31, 2014

Re: Draft Evaluation Strategy – CHP

This memo lays out a draft strategy for evaluating Combined Heat and Power projects. This strategy is open for discussion and revision by the Illinois SAG CHP sub-committee.

Sampling

CHP projects can be grouped into large custom projects and modular/packaged projects which are typically smaller. Evaluation should focus on the large sites, but still keep tabs on the smaller applications. The evaluation should stratify projects into large and not-large.

- Suggested definition of large: Nominal 1 MW engine available 95% of time, average 90% loading or 7.5 GWh generated, annually.
- Sample a census of large projects if less than ten such projects. Thereafter sample for 90% confidence and 10% precision among all “large” projects”. Possibly split the large strata for very large installations – TBD.
- Random sample of “not-large” projects: initially randomly 20% of projects. Change to a statistical sample if many projects are submitted.

CHP vs. Custom Projects.

In many respects CHP projects are simply large custom projects and their evaluation strategy parallels custom. CHP installations are complex and expensive and are frequently short-changed at the back-end commissioning. Though they work, they are not optimized and fully functional when “substantially complete.” The program post-inspection and evaluation M&V should encourage quality installation and commissioning. In Pennsylvania CHP programs do this by the customer establishing a date of “commercial operation” when they think the project will be operating as designed.

- Program post-inspection happens near start of commercial operation. Program post-inspection releases 50% of projected incentive payment.
- Evaluation M&V occurs at least 3 months following start of commercial operation.
- The evaluation must use data from ALL hours between the start of commercial operation and the evaluation inspection. Evaluated savings is based on all data since commercial operation and extrapolated proportionally for the full year. Final incentive payments are determined from evaluation M&V. Poor utilization due to lack of commissioning and/or hasty commercial operation factors into the incentive.

Impact Evaluation Approach

- Due to the complexity of these projects IPMVP – Option B is most appropriate.
- Almost always, on-board or integrated monitoring is available for CHP tracking of gross energy production. The evaluation should leverage these data, as they are often the best and easiest available. Furthermore, many engines operate at higher voltages.
- The question of net energy savings (after parasitic loads) can be challenging; however, most large installations have dedicated service or transformers (step down from, say, 13.7kV to 480V) for powering CHP auxiliaries. Often-times these loads are also sub-metered. Parasitic loads should be monitored by the evaluation M&V or utilize installed sub-metering.
- All sources of parasitic loads should be considered – added HVAC and lighting for the CHP plant and avoided energy use from (partial) abandonment of old mechanical spaces and reduced boiler auxiliary loads.
- With enough evaluation history, it might be possible to establish deemed parasitic loads – say 5% of installed capacity. Any deemed value should be conservative to encourage adequate sub-metering.
- CHP system efficiency should be based on BTU content of input fuels, BTU equivalent of net electric energy and input equivalent Btu of thermal energy provided by CHP.