**VEIC Energy Data Analyst Interview Exercise**

The following exercise is indicative of the work done by the Energy Data Analyst position.

Kindly complete the exercise and submit your results in the program used as well as a written version that outlines your approach. We anticipate this exercise would take 3 – 5 hours.

Be prepared to report out to the hiring team in the first 20 minutes of the interview. There is no prescribed format to the presentation. Simply use what is most comfortable for you to communicate your findings to a mixed audience that includes a mix of technical and non-technical peers.

**Exercise:**

Attached are anonymized data from a customer which integrates SCADA data, sub-metered power data and utility interval data in an Excel workbook.

First tab (Baseline Pressure Temperature)

    SCADA data (for calendar year 2012, baseline period:

* Refrigerant discharge pressure (psig)
* Refrigerant discharge temperature (F)
* Wet bulb temperature (F)

    Second tab (Baseline Load Power)

    SCADA and utility data for calendar year 2012)

* Refrigeration load (tons of refrigeration)
* Refrigeration compressor power (kW)
* Utility power (kW)

    Third tab (Efficient)

    SCADA and utility data for post-treatment period

* Refrigerant discharge pressure (psig)
* Refrigeration load (tons of refrigeration)
* Refrigeration compressor power (kW)
* Utility power (kW)

Efficient measure: The industrial refrigeration system uses a control point, target discharge pressure. The control system modulates cooling fans to try to maintain the target discharge pressure. At some point, the outdoor wetbulb temperature is high enough that even with all fans on full-speed the discharge pressure rises above the target. However, this occurs during a relatively small number of hours each year. For most of the operating hours the target discharge pressure can the lowered. The refrigeration compressors use less power and have higher capacity (tons of refrigeration) at lower discharge pressure. During 2012 the target discharge pressure was set for 145 psig. At the beginning of 2013 the target pressure was lowered as outlined on the “efficient” tab. We want to verify that the compressor efficiency increased (i.e., the compressors required less power for each ton of refrigeration).

**Please analyze the energy savings that can be measured between the pre and post period, your assessment of the validity of those results, and any observations about that data that would be relevant to someone who is trying to interpret your results.**

**Submittal Process:**

**Due Date:** Tuesday, September 15th at 5:00 p.m.

**Email Submission to:** Robert Stephenson ([rstephenson@veic.org](mailto:rstephenson@veic.org)), Greg Fanslow ([gfanslow@veic.org](mailto:gfanslow@veic.org)), Ethan Goldman ([egoldman@veic.org](mailto:egoldman@veic.org)), Jeff Hullstrung ([jhullstrung@veic.org](mailto:jhullstrung@veic.org)) and Emilie Grenier ([egrenier@veic.org](mailto:egrenier@veic.org))

**Interview Agenda and Hiring Team**

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| Interview Agenda: | Interview Hiring Team: |
| 5 minutes – Introductions  15 minutes – Candidate report out  5 minutes – Group dialogue on presentation  25 minutes – Q&A from hiring team  10 minutes – Q&A from candidate | Robert Stephenson – Manager, Evaluation Measurement & Verification  Greg Fanslow – Data Scientist  Ethan Goldman – Energy Informatics Architect  Jeff Hullstrung – Sr. Energy Consultant |