LIFT Scholarship Exchange Experience for Innovation & Technology (SEE IT)
Sponsored by: WRF, WEF, and NACWA

TRIP REPORT

SCHOLARSHIP UTILITY: *Regional Municipality of York, Newmarket, Ontario, Canada*

SCHOLARSHIP UTILITY CONTACT: *Dmitry Zolotnitsky, Engineer, Dmitry.zolotnitsky@gmail.com*

ATTENDEES:

- *Alyson Coons, Capital Planning and Delivery*
- *Bruno Puiatti, Corporate Energy*
- *Matt Spitzig, Operations and SCADA*
- *Dmitry Zolotntisky, Asset Management*

TRIP DATES: *May 23, 2018*

UTILITIES/SITES VISITED: *Irvine Ranch Water Districts – Michelson Water Recycling Plant*

TECHNOLOGIES/INNOVATIONS SEEN: *Battery Storage Project*

TRIP BACKGROUND and RATIONALE (250 WORDS): *What technology did you select to visit? What is the problem you are trying to address? How did you envision the LIFT SEE IT scholarship trip helping your utility?*

Technology Visited: The use of energy storage system (batteries) to reduce electrical costs.

Problem: The Regional Municipality of York (York Region) operates several water and wastewater facilities that are classified as Class A under the Global Adjustment program. The Global Adjustment fee accounts between 50% to 70% of the total electricity cost at these facilities. This fee is calculated based on the facility peak power demand (kW) during five one (1)-hour events when the Ontario grid experiences its total peak demand.

How the Visit is Helping York Region: York Region is currently investigating the use of energy storage to reduce facilities' peak demand. Although the electricity pricing process and available incentives are different in Ontario and California, the project's conceptual idea of using batteries to store energy and reduce demand at certain high peak period is similar. In addition, the project implementation model of Public-Private Partnership solution is also similar in both cases. York Region is interested in selecting a firm that will design, build, finance, operate and maintain the energy storage system for 10 years. The payments for this service will come from the realized electricity cost savings.

The site visit in May allowed York Region staff to learn from Irvine Ranch Water District's experience in implementing this project (successes and challenges). To maximize this opportunity, York Region sent representatives from four different branches, who are actively engaged in the Energy Storage Project. The trip participates will also host a lunch and learn event to educate additional York Region staff who want to learn about the project.

TRIP SUMMARY (1 page max. Please include 10 photos and a 1-2 minute video montage from the trip. The video does not need to be professional, however if you have the means to create a professional video feel free to do so): *Why did you select the specific utility and technology for the visit? Based on your visit, do you think this technology/approach works for your utility? How useful was the trip in your decision making process? What were some of the trip highlights and takeaways?*

The Project Team conducted research to find water utilities in North America who are actively pursuing Energy Storage projects. After careful consideration, we chose to visit Irvine Ranch Water District (IRWD) because of its innovative approach to water management and the fact that they have installed an energy storage system at their Water Recycling Facility. Based on knowledge and experience gained on our trip, we believe that an energy storage project is very feasible at York Region.

The trip helped us see a real-life installation of the system and an opportunity to speak directly to the plant operators who operate the system. This insight was very helpful and reassuring to our staff as we pursue this unique opportunity. We intend on sharing our experience from the trip with other municipalities who are looking to implement similar systems.

Some of the key trip takeaways and highlights were:

- **Incentive Programs** – the financial feasibility of this and similar projects are based on incentive programs offered by the State or Provincial electrical grid operators. Those programs provide specific saving opportunities that the battery storage system exploits. As such, it is very crucial to understand the electrical market.
- **P3 Delivery Model** – teaming up with private firms to design, build, finance, operate and maintain the energy storage system for a 10 year period appears to be very common for this type of project (where electrical cost savings are shared between the utility and the private company). Learning about this process was very helpful to York Region as we have not implemented many P3 projects.
- **System Optimization** – Similar to York Region, Irvine Ranch Water District spends nearly 70% of its electrical usage on pumping related activities. Prior to the energy storage implementation, Irvine Ranch Water District developed an in-house SCADA pumping schedule controller to try reducing electrical costs. The energy storage system further cuts down this cost. As such, it is crucial to implement system optimization first and then reduce further electrical demand with an energy storage system.
- **Project Schedule** – based on discussions with energy storage suppliers, a typical energy storage project should take 9 to 12 months (from conception to commissioning). However, the Irvine Ranch Water District project took two years due to various reviews and regulatory compliance. This insight was very helpful in setting up schedules and realistic expectations for York Region.
- **Specific Requirements for Utilities** – unlike industrial clients (who employ similar systems), Irvine Ranch Water District required specific SCADA information from the battery storage supplier. Those requirements were critical as the service provided by the water utility cannot be interrupted. York Region will be implementing similar measures in its energy storage projects.

Video Link

10 Photos

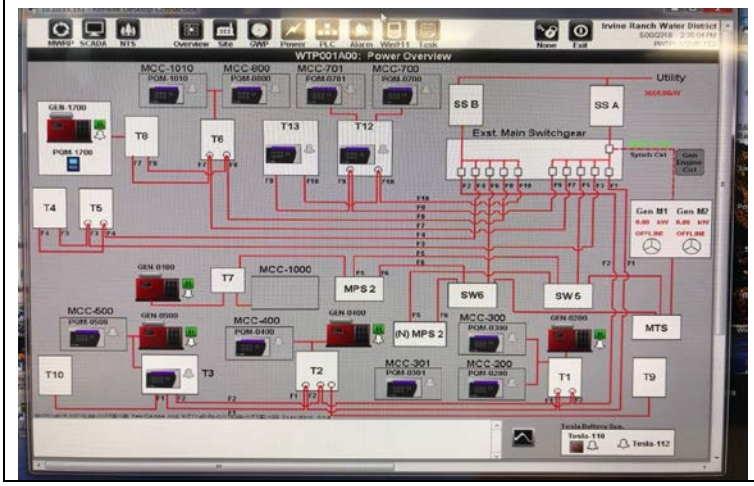
Michelson Water Recycling Plant

Recycled Water Pumps

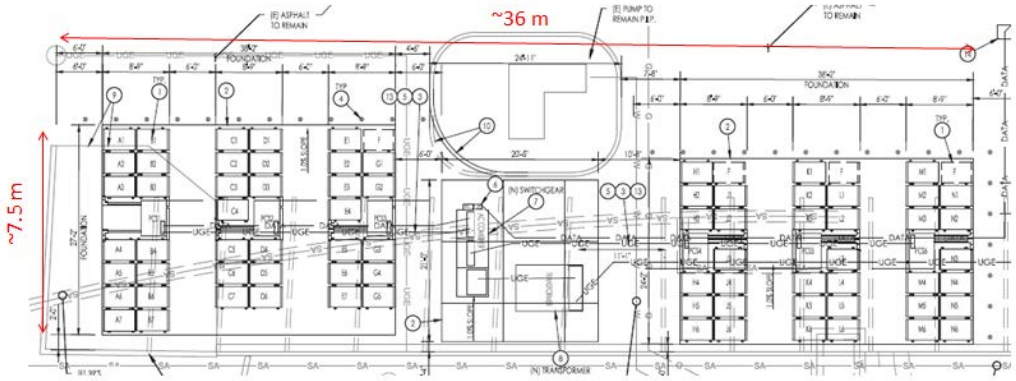
Energy Storage Battery site

Energy Storage Control Screen

SCADA Screen (monitoring for Run Fail Alarm



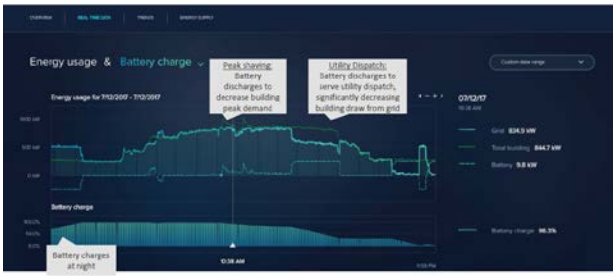
Site Plan and Battery Size (2.5 MW/15 MWH), 75 Tesla PowerPack2



Installation Phase (photo not from trip)

Installation Phase (photo not form trip)

Energy Storage System Web-portal (photo taken from IRWD presentation)



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