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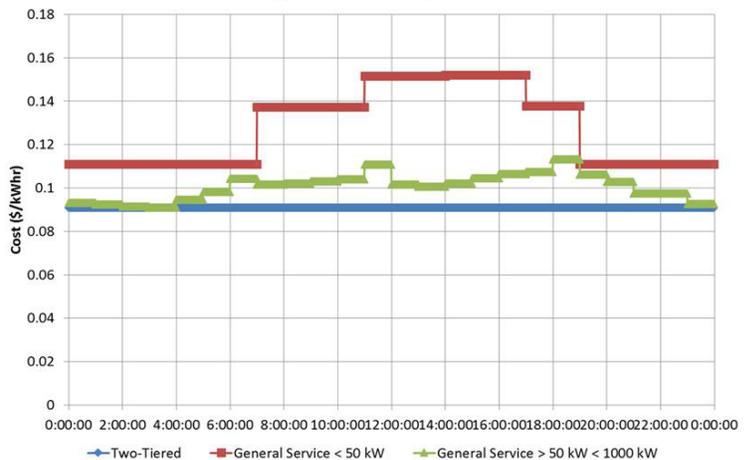
Water Supply & Distribution System Optimization

Water Supply and Distribution System Energy and Energy Cost Optimization

In order to facilitate modeling analysis of the ability to achieve power and power cost savings, the project team met with Guelph Hydro to establish the calculation protocol for power cost for each water supply and distribution facility within the City of Guelph. The calculation is a complex one which factors in elements such as the Hourly Ontario kW-Hr Energy Price (HOEP), the monthly 15 minute maximum instantaneous kW power consumption, Distribution Surcharges, time of use rates and others. These are integrated into the total cost differently depending on the size of the electrical service and averaged monthly maximum instantaneous power consumption for the service. The calculations are developed in e.RIS, Eramosa's Reporting and Information System. This software has direct links into the SCADA system database and pulls power consumption, real-time, from each site within the City of Guelph's water supply and distribution system. Automated reports provide daily and monthly site power consumption and cost metrics to the operations management team. These reports are used to establish the baseline operational condition and analyze the improved performance when changes are made.

Minute interval data files, with the power consumption and power cost data for each site are then compared with the City's hydraulic model and used to calibrate it with respect to power consumption and power cost. This enables the modeling team to then run off-line simulations of various operating scenarios versus the baseline condition, ensuring that changes are managed within safe operational guidelines maintaining fire storage, minimum system pressures, and water age.

Average October 2013 Hydro Rates



This analysis has demonstrated the potential ability to operate the system safely and realize energy cost savings between 10 to 20% in the Guelph Water Supply and Distribution system depending on the type of day analyzed (typical day versus summer average day).

We acknowledge and thank all of the industry partners on this project, City of Guelph and Eramosa Engineering.

