Converting lighting to Light Emitting Diodes (LED). Motion sensors for building lighting and ventilation. Low flow toilets and automatically flushing urinals. These are just a few of the conservation initiatives the City of Ottawa has undertaken at its municipal facilities over the course of the last decade.

“IT’S very rewarding that BEEM has been able to not only cost effectively reduce the City’s energy use and environmental footprint but also resolve problems and improve facilities at the same time”

- JP Rozon, Section Manager, Building Engineering and Energy Management, City of Ottawa

BEEM-ing with pride at the City of Ottawa’s BUILDING ENGINEERING AND ENERGY MANAGEMENT UNIT

Implementing more than 40 projects per year to “optimiz[e] tomorrow’s energy use today” Municipal facilities throughout Ottawa

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BEEM Unit established in 2002

Responsible for developing an energy conservation and demand management plan
Building on the successes of the Energy Reduction Program (2004-2009) and the Smart Energy Program (2010-2014), the City of Ottawa took another crucial step in their journey to city-wide energy efficiency and conservation by establishing the Building Engineering and Energy Management (BEEM) Unit.

With a mandate of “optimizing tomorrow’s energy use today”, the BEEM Unit is faced with the challenge of conserving and reducing energy use in a growing city[2].

The Unit’s first Energy Conservation and Demand Management Plan, released in 2015, laid out a series of capital investment projects to be implemented each year between 2015 and 2018. With an annual budget of $1 million, these projects focus on the reduction of costs and the conservation of electricity, natural gas, oil, propane and water use. By design, these investments are chosen to have an average payback period of 5.5 years, resulting from cost savings derived from either increases in energy or water use efficiency. The bulk of the projects identified in this report focus on electrical savings measures (80% of total savings), with 10% of savings focused on each of gas and water efficiency projects. Actions include:

- Upgrades of heating ventilation and air conditioning equipment
- Installation of variable speed drives to much more effectively control fans and pumps[2]
- Lighting upgrades
- Controlling ventilation and heating equipment more effectively by taking advantage of scheduling, occupancy sensors and carbon dioxide monitoring
- Heat reclaim
- Water efficiency measures

A growing number of BEEM-led projects are currently underway in Ottawa, with the development of the City’s Building Automation System (BAS) Integrator one of the most innovative and exciting.

Increasingly, City of Ottawa facilities are being controlled and monitored by a BAS, with 115 of the City’s more than 860 facilities already using some kind of BAS. These systems help optimize energy use and comfort using computer controls for heating, ventilation, air conditioning and ice rink refrigeration systems. In the past, it was a challenge for facility staff to oversee these buildings effectively, given the more than 15 different BAS vendors who each use unique software. The efficiencies to be gained by having a single, integrated system have long been clear.

The recently developed BAS Integrator, a BEEM-led project, does exactly that: it is a single, online, front end portal which all building operation and maintenance staff can use to remotely monitor most aspects of a building’s heating, ventilation and air conditioning. It allows facility and maintenance staff to use City computers and mobile phones to monitor sites, investigate problems and change schedules and space temperature set-points remotely. The different vendor control systems still control the individual buildings but mechanics can now be much more effective dealing with all the equipment through one software package. They can troubleshoot equipment while up on a roof through a portable computer or tablet. They can check on equipment at another site without leaving the roof. Operations staff can also remotely monitor satellite facilities.

For instance, at the start of hockey season when ice is being made, municipal rink personnel used to have to be on site every day to monitor and control ice making equipment. Now, personnel can remotely monitor progress and make equipment setting changes by accessing the Integrator via a laptop or smartphone[3].
CONCLUSIONS & REFLECTIONS

Across all these measures, between 2011 and 2016 the average energy intensity of City facilities has been reduced by 10%. This represents an actual measured reduction in energy use that is equivalent to $2.8 million annually and is a significant reduction in the City’s environmental footprint. Technology is constantly improving and the BEEM team is taking advantage of those improvements to help the City not only control costs but also significantly reduce its environmental impact.

REFERENCES