Saving Energy Saves Capital

HUMBER RIVER REGIONAL HOSPITAL

Like many of Ontario’s hospitals, Humber River Regional is a multi-site facility with a mix of aging buildings. The 582-bed hospital was created as a merger of three different facilities in the northwest corner of the GTA. It covers a total area of 950,000 square feet and employs 2,700 staff. The hospital’s mission is to provide first-class acute care health services to a community that has grown from 525,000 to more than 800,000 residents.

In December 2005, the Ontario government gave Humber River Regional Hospital the go-ahead for a greenfield campus at a new site. With a four to five year wait until construction begins, facilities managers are trying to find best practices to get the most efficient and cost-effective performance out of existing building systems in the interim. They are confident that the ‘lessons learned’ will be applicable to the new systems as well.

Solution

If you can’t measure it you can’t manage it. This simple principle prompted Lorie Pella, Humber River Regional Hospital’s Director of Planning, to implement a Monitoring and Targeting (M&T) Program for the facilities’ utility management. In 2004 Pella attended an Ontario Hospital Association (OHA) seminar on M&T sponsored by Natural Resources Canada and Enbridge Gas Distribution. Pella had already been the driving force for setting up a Green Committee at the hospital. He realized that M&T offered a minimal cost tool for realizing greater energy savings and environmental benefits.

M&T was launched at the Finch campus. This site provides the best data for modeling energy use because it is concentrated in two buildings constructed in the same time period. The physical plant consists of three 200 Hp boilers and one 150 Hp coil tube boiler producing steam and hot water for heating, domestic water heating and other uses. Yearly, natural gas costs were around $400,000.

Pella tracked historical natural gas use for five years. He used this profile to gain a better understanding of what drives consumption up and down. Then he built a mathematical model linking natural gas consumption to heating degree-days. The hospital’s northwest Toronto location made it possible to use weather data from Pearson International Airport. The resulting trend line was used to set target values. Comparing actual performance to target performance provides the savings calculation. When Pella spots deviations from the target line (actual use above or below) he investigates the causes, fixing problems and reinforcing best practices. Pella has also applied M&T to water use and is still working on a model for electricity consumption.
Challenges/Lessons Learned

- M&T is a low cost way to control utility costs by understanding what drives energy use, setting targets and identifying ways to improve performance.
- Finding the time and/or resources to gather and analyze the data is a challenge. On the plus side, the work can be done in-house using an Excel spreadsheet.
- The hospital already had a sophisticated maintenance program in place, but M&T has generated significant additional savings. M&T identifies problems and helps target the maintenance effort. It is valuable for troubleshooting and it demonstrates the value of preventative maintenance.
- M&T also gives a tool for quantifying good operating procedure – a way to prove that the effort pays off in terms of utility savings.
- A simple M&T system can be put in place without spending a lot on new metering. If utility bills are the data source, some information may have to be adjusted to take into account inconsistencies (different billing periods, months of different lengths). Some utilities already issue billings on a standard 30-day basis while others provide interval data. Selective, targeted metering can be introduced to gather information pertaining to particularly critical parts of the system. This keeps the costs of metering down.
- Humber set up a ‘Green Committee’ for support services. This, along with M&T, has created a culture shift so that more people are ‘thinking green’ and developing new initiatives to save energy and improve environmental performance.

Benefits

The best thing about the M&T project is that it was done in-house with no major capital investment. The benefits of this low-cost program are significant:

- First year natural gas savings of almost 170,000 m³ (roughly 10%)
- Enbridge Gas Distribution energy efficiency incentive of $8,479
- Contributed (with other efficiency measures) to annual water savings of over 30 million litres
- Ongoing operational efficiencies
- Better control over environment for patient/staff comfort
- Better understanding and management of electricity use
- Conserves capital

Update

The approval of plans to build a new hospital makes it all the more important to keep existing buildings operating as efficiently as possible to avoid unnecessary capital expenditures. Pella plans to expand M&T to the hospital’s other two campuses and is considering adding more targeted metering. The Green Committee is developing a new waste management initiative to complement the utilities program. As part of its proactive maintenance Humber River Regional Hospital takes advantage of Enbridge Gas Distribution’s Steam Saver Program for each site every two years. The Ontario Hospital Association has recognized Mr. Pella’s contribution to reducing the hospital’s environmental impact with its 2005 Green Health Care Award for Individual Leadership.

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