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Green building technologies make financial sense

Murray McCaig and Jim Dart

No one would argue the importance of making "green choices" – and nowhere is this need greater than in public municipal buildings. Increased public scrutiny puts pressure on municipalities to adopt the best possible environmental, health and safety practices. The

The Challenge

Each year, the City of Mississauga spends approximately \$14 million on utilities in its public facilities. This amount accounts for about half of the total facilities and property management annual budget. "Like many organiza-

tioning its environmental footprint. It has done this through initiatives such as a staff energy awareness program called Energenius, the implementation of a facility energy efficiency review/audit program, and its investment in "green" technologies such as PWT.

As a past winner of the Mayors' Megawatt Challenge, a program run by the Toronto and Region Conservation challenging municipalities to improve energy efficiency and environmental management in their facilities, Mississauga has publicly displayed its commitment to reducing its environmental footprint.

problem is how to balance "green solutions," such as environmental building retrofits, with the need to reduce the financial burden on taxpayers.

One new technology may provide a balance between environmental and economic concerns. Physical Water Treatment (PWT), a technology used in the cooling systems of large buildings, has been adopted by the City of Mississauga, Ontario, to reduce energy and water consumption, eliminate the use of chemicals, and cut maintenance costs.

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Jim Dart is Chief Scientist for EnviroTower and has spent his entire career in the field of water, 30 years of it with the Ministry of the Environment.

tions, our interest in conserving energy really began at a financial level," said Ken Owen, director of facilities and property management for the City of Mississauga. "We asked ourselves, how can we manage the rising costs of utilities, and what followed was the creation of programs and initiatives geared at conservation."

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Green Technologies

While programs such as Energenius focus on behavioural changes to reduce energy consumption, green technologies are often a one-time investment with the potential for ongoing energy and water savings. In choosing which technologies to invest in, the city began by researching the "low-hanging fruit" – technologies such as building automation systems, energy-efficient lighting systems and a heat recovery system, all of which offer short payback periods.

Another recent investment is the PWT system that the city has installed on the cooling system at the Mississauga Central Library, its busiest public facility.

How PWT Technology Works

Typically the water used by a cooling tower is treated with chemicals to prevent scale, corrosion and other factors. A PWT system works by treating water for all of these factors without any chemicals, and works in a manner that reduces energy and water consumption.

PWT technology has come a long way, and is now so effective that it is being installed at some of the largest buildings in North America and around the world. In addition to municipalities, some of the largest North American property management companies, hospital systems and hotel chains are adopting this technology for the environmental and cost savings benefits.

An effective PWT system works by combining three factors:

- 1) a physical water conditioner that removes scale and inhibits corrosion;
- 2) a separator, or hydrocyclone, that separates and removes all large particles produced by the "swiping action" of the physical water conditioner; and
- 3) a mineralator that adds mineral suppressants to control corrosion and other factors in the system.

Benefits of a PWT System

Municipalities can realize significant cost savings and environmental benefits from PWT. Some examples include the following:

- ▶ By eliminating scale throughout the system, the operating efficiency of a cooling tower is typically improved by 15 to 30 percent.
- ▶ The existing chemical treatment program is replaced, thereby eliminating the costs and time-consuming service and testing associated with chemicals.
- ▶ Water consumption is reduced by up to 20 percent by increasing the cycles of concentration in the cooling system.

- ▶ The equipment life of a water cooling system is extended by reducing the rate of corrosion in the system.
- ▶ Protection of the environment is enhanced by eliminating the discharge of potentially toxic chemicals from cooling towers.

The City of Mississauga first became aware of the potential savings with PWT because of the technology's application at 40 cooling towers in the Dufferin-Peel Catholic District School Board. "Cooling is a significant part of our electricity consumption, and we were aware that the schools in our district were using this with much success," said Ken Owen, who anticipates that the PWT system on the library cooling tower will deliver significant cost savings and environmental benefits. "If it works at this initial site, there are many more buildings in Mississauga that would

benefit from this technology." Within two years, the municipality's investments will likely be paid back, and the environmental benefits and financial savings will continue.

Choosing a PWT System

Now that the system is installed, the city will be looking at how consistently it performs. Factors such as energy savings, water savings and corrosion rates will be reviewed on a regular basis. What will also be considered are the benefits to the environment at large. "Not only do we hope to save money, we hope to reduce water contamination and reduce emissions that contribute to our air quality," said Owen. "This is a trial and we are looking forward to the results. We expect that this system will be a case study to take to other facilities within our city." MTW

