

## GWLRA Case Study

### New Cooling System Delivers Energy Savings, Enhanced Comfort and Reduced Costs

#### Case Study in Brief

With support from the BOMA Toronto Conservation and Demand Management (CDM) incentive program funded by the Ontario Power Authority, GWL Realty Advisors (GWLRA) installed a new chiller in a downtown Toronto commercial property. The investment delivered tangible energy savings, enhanced tenant comfort, and reduced operating expenses.

The goal was to install a new cooling system that would meet growing tenant needs and provide energy savings of about 30 percent or 1,000,000 kWh/yr. Alternatives were fully evaluated and the most economic measure was selected; a robust monitoring and verification (M&V) process produced accurate pre- and post-retrofit performance assessments.

The new chiller provided the estimated energy savings, leading to a BOMA Conservation and Demand Management (CDM) incentive of about \$50,000. More importantly, the M&V-generated results assured GWLRA that the estimated savings were realized.

#### Commercial Property Management and Energy Savings – Collaboration is Essential

Building owners contract property managers to manage, operate and meet tenant needs for their buildings. Tenant leases are typically “net” arrangements: The tenant pays direct utility costs and shares common utility expenses based on a prorated basis per square foot. Tenants therefore benefit directly from utility savings—rather than the property manager. This means that owners, property managers, and tenants must collaborate for the benefits of energy conservation to be realized.

#### Project Overview

GWLRA identified the need and began preparations for upgrading the cooling system of a large Toronto commercial office complex in 2007. A five-year capital plan was created that included a thorough evaluation of options and assumed a CDM incentive.

Following a review of options, a new Trane cooling system was recommended, tendered and awarded. The new model, with a capacity of 570 tons and an efficiency of 0.55 kW / ton, was installed and commissioned as the lead chiller in January 2009. It replaced an existing unit with a cooling capacity of about 550 tons and an efficiency rating of 0.90 kW / ton.

During commissioning, energy use by the new chiller was higher than originally estimated. BTU (energy) meters had been installed to quantify demand and accurately measure

performance. Consumption data recorded three times daily found that additional energy use resulted from extra cooling requirements. This 40 percent increase in load was directly associated with new tenants and an expanded data centre, and was accurately identified through M&V.

With this increased load considered, the energy savings were recalculated and highly positive results emerged. For the first three months of 2009, the energy savings achieved were 45 percent, that is 50 percent higher than the original base case.



#### Options Considered and Outcome

With assistance from consulting firm Energy @ Work, five options were considered:

**Do Nothing** – Every project must demonstrate its necessity. However, new legislation and the age of existing unit meant that “do nothing” was not viable.

**Partial Retrofit** – Replace key components to extend the life of the existing chiller. This was deemed not feasible as it placed tenant comfort at significant risk.

**Implement EnWave Deep Lake Water Cooling** – Deep lake cooling is considered a “green” and preferred solution where feasible; however, in this case it was impractical.

**Fully Integrated Solution: Combine Plant With New Chiller** – A total redesign would maximize chiller and storage tank efficiencies. But even with incentives, the hurdle rate was too high.

**Replace Existing Chiller With New Unit** – The best combination: Technical soundness and optimal payback.

After a four-month review of technical options and available CDM incentives, GWLRA decided to replace the existing chiller with a new unit. It was engineered, specified, tendered, installed and commissioned in early 2009. BOMA Toronto’s Conservation and Demand Management (CDM) Incentive Program was instrumental by providing:

- An accurate baseline with a thorough understanding and evaluation of alternatives.
- A return on investment that exceeded the required internal hurdle rate.
- A monitoring and verification process to formally assess the benefits of projected results.

## The Organizational Context for Energy Savings Planning

GWLRA applies overall targets for environmental improvements including energy conservation across its organization. Projects/programs are identified to support the attainment of these targets and additional property-specific initiatives are launched to address unique opportunities. Through this approach, GWLRA has established a target of reducing its energy use by 10 percent over three years.

GWLRA undertakes a five-year “rolling” capital planning cycle for each of its properties. As a project approaches implementation, a business case is prepared that identifies costs and benefits, including available incentives.

The organization’s disciplined planning/evaluation process requires that each project be subject to a full appraisal, including a technical, structural, and financial review. Energy efficiency projects are evaluated equally with other investments. Assessment criteria incorporate multiple factors, including: health and safety implications, return on investment, environmental impact, etc. Annual budgets are developed based on these five-year plans.

When a project is to be executed with current-year funding, it requires an updated cost/benefit analysis, engineering assessments, and a current business plan to ensure accurate expense projections. This updated plan considers the potential impact of incentives, which are categorized as “soft” benefits in the ROI calculation.

## Critical Success Factors For Driving Change in Energy Efficiency Projects

- 1. A Compelling Case for Change** – A top-down corporate mandate to focus on environmental responsibility generated many projects that benefited the core business.
- 2. Provide a Context for Change** – GWLRA explained pending changes in the context of broader “environmental” goals. This provided a credible framework for understanding the need for and value of proposed energy efficiency measures.
- 3. Clarity of Direction** – The Property & Technical Management Team defined specific energy targets. Projects were identified to drive the anticipated benefits. The Team attained clarity and alignment on the goal and the path to reach it.
- 4. Visible Committed Leadership** – Specific members of the management team demonstrated passionate commitment to the project, motivating staff to identify and implement energy efficiency and energy conservation measures.
- 5. Specific, Measurable Goals** – In this case, achieve a 10 percent reduction in energy use over three years. Goals for the chiller project were based on an accurate baseline measurement, and chiller replacement included installation of BTU meters to accurately record performance three times daily. This disciplined measurement process enabled identification of the 40 percent increase in load, as well as the energy savings realized.
- 6. Integrated Effort** – Success resulted from a collaborative, integrated effort that began with a master plan that ensured targets were set, tracked and reported accurately.
- 7. Effective Project and Change Management** – Management of scope, schedules, quality and costs was disciplined. The human element, which is critical to change management, was addressed through two-way communication between the project team and tenants. Operator training and support completed the effort.
- 8. The Deeper Value of CDM Incentives** – The CDM incentive funded by the Ontario Power Authority and offered by BOMA Toronto provided value in three critical ways. It required identification of correct costs / benefits through proper engineering. It improved the financial business case by augmenting the cash flow. And it required monitoring and verification which ensured that savings are measurable and sustained.
- 9. Use Human Resources Effectively** – Integrating internal strengths with external resources (where required) can overcome staff time and/or expertise constraints. For this project, the consultant undertook energy audits, obtained BOMA certification, supported project communications, developed business cases for proposed measures, and ensured that incentives were received. Post-installation activities included commissioning and co-ordinating the M&V necessary to receive the incentive; the consultant continues to facilitate processes to sustain energy saving goals.
- 10. Engage in Continuous Communication** – Communication was ongoing and robust with all parties involved in the project; tenants were a key stakeholder and target audience.

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## Make Conservation Work for Your Organization

For more information on the BOMA Toronto Conservation and Demand Management program, visit the website at: [www.bomacdm.com/](http://www.bomacdm.com/)

For more information on the broader array of conservation programs offered by the Ontario Power Authority, visit the Every Kilowatt Counts website at: [everykilowattcounts.ca/business](http://everykilowattcounts.ca/business)