



# CONSERVATION CONVERSATIONS

The Newsletter of Better Buildings Partnership

Issue 4, August 2010

## Building a Better Energy Future Together



By Richard Morris

We never cease to be amazed with the results that can be achieved by a group of dedicated people. Certainly there is no question that dedication is what the Better Buildings Partnership team is built on. The City of Toronto and its citizens and businesses have benefited significantly in the years since 1996 when BBP was mandated by Council to help bring Toronto toward sustainability on many fronts, with energy efficiency at the core

Click [here](#) to read the full story.

## This Month's Profile: Sustainable Energy Funds



The Sustainable Energy Funds, or SEFs, is the collective name for two separate but related City of Toronto funds that can help your organization overcome the hurdle of upfront costs associated with energy projects. This assistance is provided through repayable interest-free loans of \$50,000

to \$1,000,000 per project, to a maximum of 49% of total eligible project costs.

Click [here](#) to read the full profile.

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## Case Study: Mount Sinai Hospital



### Project Background

Mount Sinai Hospital (MSH) is one of Canada's leading academic health science centres affiliated with the University of Toronto. It is recognized internationally for its excellence in the provision of compassionate patient care, innovative teaching and research. MSH has taken a leadership role in environmental sustainability, and has made a commitment to reduce its environmental footprint through energy conservation and a reduction of energy use.

### Desired Outcomes

After almost 35 years, the Hospital's conventional chiller was due to be replaced. When MSH looked at the cost and environmental impact of a new conventional system versus Enwave's deep-lake cooling system, the business case was clear. A 20-year forecast revealed that energy costs using chillers would reach \$13.5 million; whereas the cost of using Enwave is \$10 million - an accumulated cost savings of \$3.5



million.

Click [here](#) to read the full case study

## Profile: Energy Audits

By Dragos Paraschiv, P.Eng., Program Operations Manager



You've heard about the benefits of energy efficient retrofits - a healthier building and environment, lower operational costs, increased resale value and a return on investment - but where to begin? An energy audit is the first step in evaluating the building and determining areas for improvement.

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## Better Buildings Partnership Updates



### BBP Team seeing a few changes

BBP has seen a change in its team make-up over the last couple of months. Most significantly has been the welcoming of Roop Mone´ as a Senior Engineer to head up the Multi-Family sector group. Roop comes to BBP with approximately 25 years of experience in energy efficiency and management. In order to meet some ambitious targets for the end of the year, Roop has put together a dedicated team. His lead on the Social & Assisted Housing side of things is Ahmad Malik who has been with BBP for approximately one year, working mainly in Portfolio Development, and who has recently accepted a Project Manager position in BBP. David Hall has successfully achieved a Project Manager position and for the time being he will continue his vital role in the New Construction program. So welcome to Roop and congratulations to Ahmad and David for adding new and continued strengths to the team.

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## Upcoming Events

### Sept 14, 2010:

Sponsor of RealREIT 2010

### Sept 15, 2010:

Sponsor of CAIC 2010

### Sept 14-16, 2010:

BBP exhibiting at BOMA National Conference

### Sept 23-24, 2010:

BBP exhibiting at IIDEX Green Building Festival

### Sept 26-Oct 1, 2010:

Sponsor of the 43<sup>rd</sup> Annual Ontario Colleges Facilities Management, Finance and Purchasing

Conference

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## Continued: Building a Better Energy Future Together

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We never cease to be amazed with the results that can be achieved by a group of dedicated people.

Certainly there is no question that dedication is what the Better Buildings Partnership team is built on. The City of Toronto and its citizens and businesses have benefited significantly in the years since 1996 when BBP was mandated by Council to help bring Toronto toward sustainability on many fronts, with energy efficiency at the core.

In fact, the program has helped the City of Toronto reach a cumulative carbon dioxide reduction of almost **2,000,000 tonnes** (as of the end of June 2010).

This is tremendous on its own, but let's also look at this in dollar value. The program has made a local economic impact (based on project costs) of \$586,000,000 and is achieving annual energy cost savings for building owners and managers of \$57,000,000. This is a huge accomplishment that everyone involved with the program should feel proud of. In particular we want to bring attention to the great public private partnerships that have made many of these numbers possible, including 12 third-party project evaluators and over 30 active energy management firms. Of course this is really about our customers and helping them make projects a reality - we would not be able to report 55.90 MW of energy saved toward our current program target if it weren't for them.

We are already in the final two quarters of our current three-year contract with the Ontario Power Authority. As we approach this milestone, we thought it would be a good time to share some highlights from our mid-year 'report card'. Though our targets with OPA are strictly focused on the conservation of electricity, we are making efforts to conserve all energy forms. As the City of Toronto, our interests and targets go well beyond energy savings to include the whole picture. Accordingly, we apply targets such as annual carbon dioxide reduction, retrofitted floor area, annual energy cost reduction, and many more measurements that speak to our efforts in building and operating a truly sustainable city.

### BBP & Results to End of June 2010

	TOTAL
Number of Approved Projects*	1,491
Number of Completed Projects*	1,018
Retrofitted Floor Area (ft <sup>2</sup> )	115,000,000.00
Job Creation (person yrs)	16,900.00
Economic Impact (Project Cost)	\$586,000,000.00

Annual Energy Cost Reduction (\$/yr)	\$57,000,000.00
Cumulative CO <sub>2</sub> Emission Reduction (tonnes )	1,849,000.00
<b>Total of BBP &amp; SEF Funds delivered to date</b>	<b>\$71,770,000.00</b>

+ BBP Projects ranges from 1997 to present  
 \*Some projects involve more than one building

Also here is a summary by sector of our achievements and progress:

Sector	Program MW Target	Cumulative Achievement to June 30, 2010 (Adjusted MW)	% of Target Achieved
New Construction*	10	5.99	111%
MASH	35	33.30	134%
Multifamily Residential	10	7.51	154%
MEER Private Buildings	16	4.65	51%
MEER Assisted Social Housing	18	4.45	44%
Total for All Sectors	89	55.90	103%

\* New Construction numbers reflect actual completed projects for which incentives have been paid.

As you may note from the breakdown of sector results, our Multi-family sector has some ground to cover before year end. We encourage everyone to look at the opportunities to apply for BBP incentive funds. Remember, retroactive applications can be considered for projects completed since 2008 for Multifamily buildings under the Multifamily Energy Efficiency Rebates program, and 2006 for Municipal Academic Social Service and Healthcare buildings. This is the case especially if it is a 'high savings' measure such as a chiller replacement. This retroactive eligibility is something that won't be available for much longer (deadline December 31, 2010) so we encourage you to act quickly.

As always, we urge you to contact one of our project managers to make sure you are not missing an opportunity, whether you are a building owner, manager or energy management firm. The Better Buildings Partnership has demonstrated tremendous success to date and we have great expectations to continue to build a better energy future in 2011 and beyond.

*Richard Morris is the Manager of the Energy Efficiency Office.*

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### Continued: Profile: Sustainable Energy Funds



The Sustainable Energy Funds, or SEFs, is the collective name for two separate but related City of Toronto funds that can help your organization overcome the hurdle of upfront costs associated with energy projects. This assistance is provided through repayable interest-free loans of \$50,000 to \$1,000,000 per project, to a maximum of 49% of total eligible project costs.

Totaling \$62 million, two SEF funds are available to the end of 2012. Firstly, the Toronto Energy Conservation Fund (\$42 Million) enables energy efficiency improvements in existing buildings, while the Toronto Green Energy Fund (\$20 Million) supports the undertaking of renewable energy

installations in new or existing buildings, many of which qualify for Ontario's Feed-in-Tariff program. In some cases a comprehensive project is eligible to receive assistance from both funds to a maximum of \$2,000,000.

SEF complements the electricity savings incentives also offered through the Better Buildings Partnership (BBP), so that projects that are eligible for an upfront SEF loan may also potentially benefit from BBP's energy savings incentives which are payable when the project is complete. Combined, SEF loans and BBP incentive grants provide almost \$100,000,000 toward the implementation of energy efficiency and conservation projects in the City of Toronto.

#### **Eligible applicants must:**

- be in the Municipal, Academic, Social Services or Health Care (MASH) sector, a not-for-profit organization, or a private multi-residential building
- operate a facility or a building within the borders of the City of Toronto
- be able to enter into, and provide security for, a loan agreement with the City of Toronto
- provide a feasibility study (required after the initial Intent to Apply submission is accepted) indicating the project will achieve greenhouse gas reductions due to energy savings and/or clean energy generation

#### **Examples of eligible Toronto Energy Conservation Fund (TECF) projects include, but aren't limited to:**

- Building envelope upgrade
- HVAC upgrade
- Improved building automation and controls
- Heating or cooling plant upgrade
- Air distribution system retrofit

#### **Examples of eligible Toronto Green Energy Fund (TGEF) projects include, but aren't limited to:**

- Solar photovoltaic installation
- Solar pool heating
- Solar domestic hot water heating
- Wind power installation
- Geo-thermal installation (ground source heating/cooling)
- Bio-mass energy

#### **How to Apply:**

Applying to the Sustainable Energy Funds is a two step process for the participant. Intent-to-Apply Forms are available on the City of Toronto website at [www.toronto.ca/energy/sef.htm](http://www.toronto.ca/energy/sef.htm). Complete and submit this form to the Energy Efficiency Office as a first step in applying.

The SEF Administrator will review the Intent-to-Apply application in detail and, if satisfied that the project is eligible, the participant will be requested to proceed to the second step of preparing a detailed application. This part of the process requires a technical and financial feasibility study that assesses the viability of the project including key factors such as project costs, project timelines, energy savings/generation, emissions reductions and payback period. The extent to which a project fulfills these criteria will determine the percentage of total eligible costs that the project will receive (up to 49%).

#### **Repayment of Loans:**

**The maximum repayment term for repayment of a SEF loan is negotiable, based on the expected payback period achieved through energy savings and other sources of revenue (for example, Ontario's Feed-In-Tariff program). The maximum term for an SEF loan repayment is 10 years for TECF and 20 years for TGEF.**

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## Continued: Case Study of Mount Sinai



### Project Background

Mount Sinai Hospital (MSH) is one of Canada's leading academic health science centres affiliated with the University of Toronto. It is recognized internationally for its excellence in the provision of compassionate patient care, innovative teaching and research. MSH has taken a leadership role in environmental sustainability, and has made a commitment to reduce its environmental footprint through energy conservation and a reduction of energy use.

### Desired Outcomes

After almost 35 years, the Hospital's conventional chiller was due to be replaced. When MSH looked at the cost and environmental impact of a new conventional system versus Enwave's deep-lake cooling system, the business case was clear. A 20-year forecast revealed that energy costs using chillers would reach \$13.5 million; whereas the cost of using Enwave is \$10 million - an accumulated cost savings of \$3.5 million.

### Solution and Results

To achieve the goal of energy conservation and reduction, MSH converted to the

Enwave Deep Lake Water Cooling (DLWC) program, providing participants with chilled water through an underground piping distribution network, instead of cooling their buildings with in-house chillers.

The primary challenge with this project was the installation of the revised chilled water piping that was required for the system changeover. MSH's chillers and cooling towers are located on the top of the building, while the Enwave heat exchanger had to be installed in the base of the building. It was not possible to create an interior piping route from the top of the building to the basement. As a result, Mount Sinai installed a new exterior shaft along the south face of the building in order to run the piping from the chillers and cooling towers down to the heat exchanger.

By removing the chillers and converting to DLWC, MSH will achieve significant economic and environmental savings. The costs of purchasing new transformers and the replacement costs of chillers will now be avoided, resulting in savings of about \$600,000. By converting to DLWC, MSH is helping to free up over 61 megawatts of electricity from the city's electrical grid, equal to the energy needed for 6,800 homes annually. Over the next 20 years, the conversion will result in \$3.5 million in energy cost savings

Removing the chillers from the facility has created additional space for infrastructure upgrades, now being used to house energy power diesel generators; a critical upgrade that would not have been possible without removing the chillers. Removing the chillers also reduces the amount of waste produced by MSH, with no need to dispose of the unit at the end of its useful life. BBP provided an added incentive to Mount Sinai Hospital's Enwave project, helping to ease the initial investment in the Enwave technology, giving the Hospital a one-time grant of over \$722,000.

### Project Snapshot

- Project Cost: \$6,077,431
- Annual electricity savings: 2,400,000 kWh
-

Annual CO2 savings: 2,309 tonnes



BBP incentives received: \$722,693

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## Continued: Profile: Energy Audits

By Dragos Paraschiv, P. Eng., Program Operations Manager



### Energy Audits: Your roadmap to energy efficient retrofits

You've heard about the benefits of energy efficient retrofits - a healthier building and environment, lower operational costs, increased resale value and a return on investment - but where to begin? An energy audit is the first step in evaluating the building and determining areas for improvement.

Ultimately the objective is to develop a realistic energy project plan to help decide which energy efficiency retrofits suit a building the most, whether it's an upgrade to your building's envelope, a lighting upgrade, a new chiller, or a new renewable energy system installation. The range of options is endless but getting started is always half the battle.

Here are a few FAQs to help be informed on what is involved:

#### What exactly is an energy audit?

A comprehensive **energy audit** is a process to evaluate where energy is used in a building, and includes understanding how energy is used, establishing baseline information and identifying where energy use can be reduced without negatively affecting the building users.

#### What is the most reliable resource for having an audit done?

Building owners and operators can initiate the energy related activity by identifying when energy use is not required, for example lights on in unoccupied spaces or ventilating at full capacity building areas only partially occupied. Building users and operators can achieve a more efficient operation by increasing their awareness and by training. However, for a comprehensive approach, we recommend to involve an energy management firm (EMF), specialized in providing energy related services. We list on our web site a number of EMFs that have implemented energy retrofit projects within the Better Buildings Partnership program or expressed interest in working with us.

#### How should it be carried out in order to produce reliable usable information?

A successful process is based on a clear procedure verified over time, for example, ASHRAE published Procedures for Commercial Building Energy Audits. This document aims to provide both purchasers and providers of energy services with a complete definition of good procedures for an energy survey and analysis. It also provides a format for defining buildings and their energy use that will allow data to be shared in meaningful ways.

#### How much can I expect an energy audit to cost and how long does it take?

Depending on building characteristics and requirements of its owner, completing an energy audit may involve different levels of effort. ASHRAE classifies these activities on three levels:

- Level I - Walk-through analysis includes an energy bills analysis and conducting a brief on-site survey of the building that will identify and provide cost/savings analysis of low-cost/no-cost measures and identify potential capital improvements that merit further consideration.
- Level II - Energy survey and analysis: includes a more detailed building survey and energy analysis that shows a breakdown of energy use in the building, and will provide cost/savings analysis of all practical measures that meet the owner's constraints and economic criteria. It

also identifies potential capital-intensive improvements.

- Level III - Detailed analysis of capital-intensive modifications: focuses on potential capital-intensive projects and provides cost/savings analysis with a level of confidence sufficient for major capital investment decisions.

The cost and duration required to complete an energy audit depend on the complexity of the building and level of effort selected by the owner. It can vary from a few person-days for a Level I-Walk-through analysis in a school or apartment building, to several months for a Level III - Detailed analysis in a hospital, university campus or complex office building.

#### Does BBP's program help with the cost?

In the case of our Multifamily Energy Efficiency Rebates (MEER) program the BBP can rebate the cost of an audit up to \$35 per dwelling unit.

#### What do I do next once the audit is complete?

After completion of the audit you will know your systems better and where the best opportunities are for energy savings. Next you will need to determine the cost of various energy savings measures and the operational costs that can be derived and start to set some priorities and time-lines. If you do not have in-house resources to do this you may want to get a few proposals from energy management firms that do this kind of work. My colleagues at the Better Buildings Partnership can help by providing a roster of energy consultants and contractors who may be suited to your project.

Interested in getting started? If you have further questions contact us at [bbp@toronto.ca](mailto:bbp@toronto.ca)

*Dragos Paraschiv is responsible for program operations and technical services related to the Better Buildings Partnership programs. He provides technical advice within the program and consultation with consultants and government authorities associated with these programs. Dragos has a Bachelors degree in Electrical Engineering and a Ph.D. in Power Engineering. He is a member of Professional Engineers Ontario.*

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