

AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS INC.

LONDON CANADA CHAPTER #116

http://LondonCanada.AshraeChapters.org

Mon Apr 26/2010

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History & Newsletter Tom Pollard ph: 519-685-2570 tpollard@execulink.com Topic:

Technical Tour TD Canada Trust Branch 3029 Wonderland Rd S

Tour and Project Guide **Mr Jamie Kruspel** Relationship Manager Facilities & Environmental Management TD Canada Trust, Retail Real Estate

The tour of the TD Canada Trust branch at 3029 Wonderland Rd S will show the thermal energy storage devices, the solar array, facility enhancements, and the building automation system that integrates everything. The project is in progress and is not yet a finished product. The goal of the tour is to demonstrate how different technologies can be economically applied at a small commercial facility and greatly improve its operational efficiency. The building automation system will be presented live during dinner. The branch will be open during the tour and there will be plenty of parking available. Please be prepared to ascend to the roof via a standard interior hatch.

Meeting - Mon Apr 26/2010

5:15pm - Tour TD Canada Trust Branch 3029 Wonderland Rd S

at Southdale Road W

6:30 - Dinner Seven Dwarfs Restaurant 1659 Wharncliffe Rd. S., London

\$35.00 for London Chapter dues paid members \$10.00 for Students with valid student card \$45.00 for others





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President's Message:

March came and went, and April has almost passed already. The warmer weather seems to be for the most part here to stay.

Last month our meeting had a reasonable turnout for our speaker - Eric Stewart – President of Innovative Cooling Technologies from Ottawa who came to speak to us about Hybrid Geothermal/Thermal Energy Storage systems that are suitable for medium sized multi-unit residential and light commercial buildings.

On Wednesday, April 21st (this week...) The ASHRAE Web Broadcast will run from 1 PM to 4 PM, and the topic is "Right from the Start – Commissioning for High Performing Buildings".

the London ASHRAE Chapter is hosting a local session of the broadcast at Baymar Supply's London Office location at 521 Consortium Court here in London.

Anyone interested in attending should contact Eric Shaw at eshaw@baymarsupply.com, or (519) 964-0022. There is no cost for this event.

Our April meeting will be a technical tour to a new TD – Canada Trust Branch that has been recently finished here in London, with a focus on improving energy efficiency as a major part of the design and construction goals. Jamie Kruspel – our Chapter Secretary – Jamie Kruspel will be the tour guide, and our dinner after the tour will be at the Seven Dwarfs Restaurant location at 1659 Wharncliffe Rd. S., London, (Lambeth area)

At last month's meeting we discussed some proposed changes to the format of our annual golf tournament in June; namely the possible elimination of the golf prize table and golf prizes – primarily as a way to limit the need for rate increases to do with the golf tournament.

We received feedback that indicated that the attendees would prefer to retain the prize table. We have received a generous offer of assistance with the collection and organization of that part of the tournament which will assist in keeping the cost and extra work required to a reasonable level. We will have more details on this soon.

The London ASHRAE Golf Tournament is June 7th, and you will find tournament registration information and detail is covered in another part of the newsletter.

As mentioned in last month's newsletter, we are calling for potential candidates for our annual chapter Board of Governor's nomination process – providing the opportunity for anyone that would be interested in getting involved at the local chapter level of ASHRAE – we welcome your input.

We look forward to seeing you all out to the meeting on the 26th

Eric Shaw President - ASHRAE London Canada Chapter



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<u> April 26/2010</u>

London Chapter member Jamie Kruspel will be conducting a technical tour at the TD Canada Trust Branch, 3029 Wonderland Rd S (at Southdale Rd) to show and explain the mechanical and electrical systems in dialled at the bank branch to offset utility consumption and LEED requirements. Using thermal ice storage and photovoltaic panels both cooling and electrical load shifting and offsets have been created.

Refer to other information within this newsletter. and be sure to attend the technical tour.

Next Meetings and Events

Web Apr 21/2010 Webcast: Commissioning for High Performing Buildings 1:00-4:00pm EDT http://www.ashrae.org/education/page/557 London Hosting Location: Baymar, 521 Consortium Ct., London

Mon June 7/2010 ASHRAE London Golf Tournament Forest City National 16540 Robin Hill Road London, Ont

ASHRAE London Canada Chapter Elections

Chapter elections are open for the 2010-2011 chapter year. The executive and chapter operations require a number of people to step forward to volunteer their time.

If your are interested, or know of a chpater member that may be able to assits in chapter operations, please contact Denis Dawe at <dennis.dawe@chorley.com> or 519-679-8660.

Previous Meeting Summary

Eric Stewart from Innovative Cooling Technologies of Canada Limited presented an overview of Hybrid Geothermal/Thermal Energy Storage systems that are suitable for medium sized multi-unit residential and light commercial buildings. Eric showed some system layouts and example projects.



Daryl Somers, CET

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ASHRAE LONDON & AREA 2010 GOLF TOURNAMENT

- Date: MONDAY JUNE 7/2010
- Location: FOREST CITY NATIONAL 16540 Robin Hill Road, London, Ont.
- Tee Off: Shotgun Start at 11:30am Scramble Format/Best Ball
- Cost: \$150.00 Golf and Dinner per person \$45.00 Dinner Only
- * Light Lunch Included
- * 4-Star Course
- * Golf Carts included
- * Buffet Dinner Included
- * LIMITED SPACES AVAILABLE

For Registrations: contact

Jamie Kruspel or <jamie.kruspel@td.com> cell#: (519) 200-2197 Karl Gilroy <KGilroy@price-hvac.com> 519-451-5100

Payment must be made <u>before Friday May 21/2010</u> to secure your group(s). Please make cheques payable to: ASHRAE LONDON CANADA CHAPTER

HOLE SPONSORSHIP ALSO AVAILABLE (\$200.00 per company) for ASHRAE RESEARCH CANADA

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Program to provide information aimed at reducing building energy use

Pilot Building Energy Labeling Program Launched by ASHRAE with Leading Owners, Designers

A new program to inform building owners and operators, tenants and prospective buyers on the energy use of buildings, similar to a nutrition label on food or miles per gallon ratings on cars, was launched today to encourage the building industry to find ways to cut energy use and costs.

The Building Energy Quotient program, which will be known as Building EQ, will include both As Designed (asset) and In Operation (as operated) ratings for all building types, except residential. It also will provide a detailed certificate with data on actual energy use, energy demand profiles, indoor air quality and other information that will enable building owners to evaluate and reduce their building's energy use. The program is administered by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

"Information on a building energy's use is the critical first step in making the necessary changes and choices to reduce energy use and costs," Gordon Holness, ASHRAE president, said. "The Building EQ program provides an easily understood scale to convey a building's energy use in comparison to similar buildings, occupancy types and climate zone, while also providing building owners with building-specific information that can be used to improve building energy performance."

Holness noted that building energy use disclosure is already mandatory in California; Washington, D.C.; Austin, Texas; Washington State; the European Union; and Australia.

Those participating in the pilot program are leading building owners and designers, real estate developers and government agencies, including:

* The Durst Organization, the owner, manager and builder of 9 million square feet of mid-town Manhattan office and residential properties, will include 4 Times Square, 1155 Avenue of the Americas and One Bryant Park in New York City in the pilot

* The U.S. General Services Administration, the primary agency responsible for the acquisition and management of federal buildings owns or leases 8,600 properties and maintains an inventory of more than 354 million square feet of workspace for 1.1 million federal employees

* Wright Runstad and Co. develops, acquires, manages and leases high-quality commercial office buildings located primarily in the Pacific Northwest, headquartered in Seattle, Wash.

* Ashforth Pacific, Portland, Ore., a diversified real estate firm that owns, develops and invests in assets and provides third-party services, including assets and property management, general contracting and construction management

* BNIM Architects, a leader of a new generation of design firms headquartered in Kansas City, Mo., will include The Omega Center for Sustainable Living in Rhinebeck, N.Y.; the Internal Revenue Service, Kansas City Campus, Kansas City, Mo.; and the Fayez S. Sarofin Research Building, home of the Brown Foundation Institute of Molecular Medicine for the Prevention of Human Diseases, the University of Texas Health Science Center, Houston, in the pilot

* Hines, a privately owned real estate firm involved in real estate investment, development and property management worldwide headquartered in London and Houston, Texas, will place high-profile properties from five major U.S. market in the pilot

* The Detroit-Wayne Joint Building Authority will include the Coleman A. Young Municipal Center, which is home of six branches of city and county government including Circuit and Probate Courts, City and County Clerks and the Executive and Legislative branches of the City of Detroit, in the pilot

* The Michigan Department of Management and Budget, which acquires and manages properties for many of the state's agencies

* Russell Development Co., which has produced significant commercial buildings in downtown Portland, Ore., will include 200 Market Building in the pilot.

"The Durst Organization is proud to assist ASHRAE with this pilot program," Don Winston, P.E., vice president technical services, The Durst Organization, said. "To continue advancing the state-of-the-art of high-performing buildings, it is essential that the gap between predicted and actual performance be identified and understood. By including both As Designed and In Operation ratings, this system will help us better understand what works and what doesn't, and allow us to make better informed design choices in future projects."

Through the pilot program, the Building EQ program will allow fine-tuning and final development of the program. In parallel with this effort, ASHRAE has developed a certification program for building energy modelers. Following completion of the pilot program in mid-June, the program is expected to be fully functional by the end of 2010.

Under the program, new buildings will be eligible to receive an As Designed, or asset, rating, which provides an assessment of the building based on the components specified in the design and is based on the results of building energy modeling and simulation. An In Operation rating will be available once the building has at least one year of data on the actual energy use and is based on a combination of the structure of the building and how it is operated. Existing buildings would be eligible to receive both an As Designed and In Operation rating.

"With procedures for both an As Designed and In Operation rating, building owners can make side-by-side comparisons that could further reconcile differences between designed and measured energy use on an ongoing basis," Holness said. For more information, visit www.buildingEQ.com.

ASHRAE, founded in 1894, is an international organization of some 50,000 persons. ASHRAE fulfills its mission of advancing heating, ventilation, air conditioning and refrigeration to serve humanity and promote a sustainable world through research, standards writing, publishing and continuing education.



Health Care Facility Ventilation Standard Incorporated into FGI Guidelines

As a move toward a single consensus-based standard of care, a ventilation standard from ASHRAE and ASHE has been incorporated into the Guidelines for Design and Construction of Health Care Facilities, copyrighted by the Facility Guidelines Institute and published by the American Society for Healthcare Engineering (ASHE).

ANSI/ASHRAE/ASHE Standard 170-2008, Ventilation of Health Care Facilities, defines ventilation system design requirements that provide environmental control for comfort, as well as infection and odor control.

The inclusion of Standard 170 in the 2010 edition of the Guidelines replaces much of the ventilation material previously included in the Guidelines. This merger is intended to eliminate potential confusion by having two national ventilation standards for health care. The Guidelines are used by more than 42 states and several federal agencies to regulate health care facility design and construction around the United States, meaning that in some states Standard 170 is likely to be adopted into code as part of the Guidelines.

Changes Proposed for Standard 90.1 Address Metal Buildings

Changes to assembly descriptions and U-Factors regarding metal building assemblies are being considered in the 2010 version of Standard 90.1, expected to be published in the fall.

ANSI/ASHRAE/IESNA Standard 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential Buildings, provides minimum requirements for the energy-efficient design of buildings except low-rise residential buildings.

The changes regarding metal buildings are among many being proposed for the 2010 standard. Some 43 addenda already have been approved, impacting the standard in a variety of ways from energy recovery to controls to day lighting.

The proposed changes are in Standard 90.1 Appendix A "Rated R-Value of Insulation and Assembly U-Factor, C-Factor and F-Factor Determinations." The revised Appendix A resulted from a Metal Building Task Group investigation of existing metal building stock that revealed that typical installation practices of the single and double-layer assemblies described in Appendix A compress insulation and thereby negatively affects the thermal performance of the assembly. The previously published R-Values/U-Factors did not reflect the thermal performance from such installation methods, which typically yield lower R-Values and higher U-Factors. The proposed Appendix A adds revised modeling equations to estimate the performance of compressed insulation in metal building assemblies based on these less energy-efficient installation practices, as well as incorporates the modified R-Values/U-Factors for metal building assemblies that reflect these new modeling equations.

The Metal Building Task Group's investigation grew out of an ASHRAE appeals panel recommendation that SSPC 90.1 review expeditiously all available information to determine if the metal building assembly U-Factors in the current 90.1 Standard are appropriate.

New Guidance on Clearing the Indoor Air through Improved IAQ

Ensuring good indoor air quality (IAQ) means everyone breathes a little easier: occupants who experience improved health, comfort and productivity, and owners who see increased building value and reduced risk.

New guidance for achieving enhanced IAQ is available from five leading building industry associations and the U.S. Environmental Protection Agency. The book and CD provide strategies needed to achieve good IAQ using proven technologies and without significantly increasing costs.

"The health and comfort of buildings occupants is too important to leave IAQ as an after-thought in design, construction and operation," said Andrew Persily, Ph.D., chair of the committee that wrote the new guidance. "There is plenty of experience out there to help avoid IAQ problems in buildings, allowing all of us to breathe a little easier.

The Indoor Air Quality Guide: Best Practices for Design, Construction and Commissioning is a collaboration between ASHRAE, the American Institute of Architects, the Building Owners and Managers Association International, U.S. Environmental Protection Agency, the Sheet Metal and Air Conditioning Contractors of North America and the U.S. Green Building Council.

The book describes 40 strategies for achieving critical IAQ objectives related to moisture management, ventilation, filtration and air cleaning and source control. It also highlights how design and construction teams can work together to ensure good IAQ strategies are incorporated from initial design through project completion.

Here a few tips from the guide on improving IAQ in buildings:

Bring IAQ into the very earliest design discussions. Don't get stuck retrofitting the design for IAQ at the end of the process
Strictly limit liquid water penetration and condensation in the envelope, and control indoor humidity.

• Where outdoor air quality is poor, use enhanced filtration and air cleaning to provide high quality ventilation air. Locate outdoor air intakes away from contaminant sources and provide the means to measure and control minimum outdoor airflows.

Select building materials and furnishings that have low contaminant emissions and don't require use of high-emitting cleaning products.

• Exhaust contaminants from indoor activities as close to their source as possible.

Recognize that O&M is essential to long term IAQ, and provide the access, training and documentation needed to facilitate O&M.
Commission from design through occupancy to ensure that IAQ objectives are met.

A summary document of the Indoor Air Quality Guide – ideal for a general understanding of the importance of major IAQ issues can be downloaded for free at www.ashrae.org/iaq. The full publication complete with a CD that contains detailed guidance essential for practioners to design and achieve good IAQ is available in hard copy or electronically for \$29.

To order, contact ASHRAE Customer Service at 1-800-527-4723 (United States and Canada) or 404-636-8400 (worldwide), fax 404-321-5478, or visit www.ashrae.org/bookstore.

Project Zero-Ė

The TD Canada Trust at 3029 Wonderland Rd S in London has been selected as a pilot location for several innovative initiatives that will reduce and shift energy consumption and improve its overall operation. The building can be classified as "Small-Commercial." It has an area of 5,000 sq ft and is open 10-12 hours per day. It is representative of the TD Canada Trust standard model and is similar to many other institutions of this type. It is well suited to demonstrate the success of its implemented technologies.

Project Zero-Ė has three components:

- Phase I: peak shifting of electricity,
- Phase II: electricity generation, and
- Phase III: operational efficiency.

The initial focus of Project Zero-Ė is the shifting of TD Canada Trust's electrical consumption to off-peak hours. Currently, London Hydro is building the infrastructure to support the installation of time-of-use



(smart) electrical meters. The rate of electricity varies throughout the day and once these metres are installed, these costs can be applied to the consumer. It is predicted that at peak times (late morning to evening) electricity will cost significantly more than during the off-peak times. It is therefore prudent as a commercial entity (with many shareholders) that operates mainly during peak times to take measures to reduce consumption and shift to off peak. Not only would a significant cost savings be realized, but this action would greatly reduce the impact and demand on the electrical distribution system.

In any small commercial retail space, like a bank branch, the air conditioning can account for 20-40% of the overall facility electrical consumption. 95% of that consumption is attributed to the compressors that are the engine of the air conditioning process. Thermal Energy Storage is a means to store the energy required to compress the refrigerant so that the energy required for that process is consumed at off-peak times. Many small commercial buildings rely on packaged rooftop heating and cooling units for their climate. The Ice-Bear 30 is one product that is designed to integrate with five ton packaged rooftop units. It is perfectly suited for the small commercial market

The Ice-Bear 30 is a large tank of water that operates by making ice during a prescribed time, usually offpeak. That ice is then used during the day to passively extract heat from the cooling fluid. There are now two refrigerant loops in place. The traditional loop with the RTU's compressor and the other from the Ice-Bear 30 to the RTU; a second evaporator coil is inserted into the compatible RTU. Two of these devices

have been installed at 3029 Wonderland Rd S to account for the majority of the cooling load. Electrical consumption data obtained through the Ubiquity control system shows a clear shift in the peak usage at this branch.

The majority of the air conditioning load has been shifted to off-peak hours through the use of the Ice-Bear 30. There is still a small load required during the day: the fans and the refrigerant pump. To achieve a truly Zero-Peak™ air conditioning load, Project Zero-Ė



required that consumption be offset. This is where phase II was introduced.

Onsite Electricity Generation, via photo-voltaic array, was considered as this branch has a clear view to the south and plenty of open space on the roof. Initially, a small 4kW array was considered to offset the remaining air conditioning load. However, upon further review, it made great sense to install as large of an array as possible. The size of the array was only limited by the size of the roof. Therefore, at 14.28 kW solar array has been installed. This system will generate enough electricity to account for 50% to >100% of the branches overall electrical load. Not only has the air conditioning system been shifted off-peak, but this branch can be considered to operate "off-grid" at times. (see the chart).

A building automation system designed for small commercial facilities has been installed. It is based on a wireless thermostat for each RTU and a master controller. This system can be easily installed at many locations and the group can be monitored and troubleshot from any computer with an internet connection. Building on this system was crucial to validate the different initiatives so several monitoring and control functions have been added. The electrical consumption of many components of the facility can be independently monitored and measured on a minute by minute basis. This data shows how different components work at different times of the day. A key finding was that the baseboard heaters were not properly controlled and operating during unoccupied hours. A control has been implemented and a significant energy waste was eliminated.

In addition to the technologies described above, there is an opportunity to greatly improve the operational efficiency of the facility. A modest goal of LEED Platinum for Existing Buildings is being sought for this branch. A review is underway and key highlights include:

- No or low-water landscaping
- Reflective hardscapes (pavement, sidewalks, etc...)
- Water Use reduction
- Storm Water capture and re-use
- Sustainable purchasing and cleaning policies
- Lighting retrofits to the exterior & interior
 - LED fixtures to replace fluorescent T8 tubes
 - LED pot lamps to replace compact fluorescent lamps
- Overall energy consumption reduction

This branch will receive the LEED Platinum for Existing Building designation in 2010. This goal is aggressive, but achievable. Although it may not be feasible to apply all aspects of the three components of this project, or to pursue LEED certification at all of the TD Canada Trust locations, it is certain that many sites can be positively impacted by the selective implementation of suitable initiatives. The lessons learned from the implementation of this London-based project for TD Canada Trust will be used to support a national roll-out of environmental and operational efficiency.

The TD Canada Trust at 3029 Wonderland Road South in London is a beacon of environmental efficiency and design. It will be a standard for which all retail operations can be measured. The continued success of Project Zero-È demonstrates that there is plenty of opportunity to improve upon the design and operation of small commercial facilities. The challenge is there for all engineers, owners, and operators to dive-in and learn.