

**Cost Efficient Operations
How to Focus on What Really Counts**

**Exhibition Place submission for
UFI Operations Award 2010**



UFI member since November 2000

Direct Energy Centre

Exhibition Place

Direct Energy Centre is Canada's largest exhibition and convention facility, and rated in the top ten in North America.

over 99,900 square metres of connected space

9 exhibit halls

9,000 seat arena



Exhibition Place

Local Board of City of Toronto

Contributes all annual profits to the City

Canada's largest entertainment venue - attracting 5.2 Million visitors annually

192 acres (77 hectares) with 51 acres (20 hectares) of parkland

Regional/Local transit services site at multiple stops



Location - Aerial View

Exhibition Place



Exhibition Place

Hosts more than 350 events annually - 100 Trade fairs

12 permanent long-term tenants

BMO Field – home of the Major League Soccer - Toronto Football Club (TFC)

Ricoh Coliseum – home of the American Hockey League - Toronto Marlies



Exhibition Place

6700 parking spaces & 348 bicycle parking (indoor & surface)

22 buildings/structures - 8 designated by *Ontario Heritage Act*

Direct Energy Centre – completed in 1997 – 99,900 sq. metres contiguous floor space – 6th largest in North America

Allstream Centre – opened as LEED Silver in October 2009 – 4,100 sq. metres ballroom and 22 meeting rooms

Home of the annual CNE Fair – 130th year

Objectives

Exhibition Place's objective was to lower electrical consumption associated with operating our exhibition facilities, thereby reducing our environmental footprint and utility costs.

To achieve this objective, a three pronged approach was taken:

- i) amend existing procedures for operation of exhibition facilities
- ii) retrofit existing facilities to be more energy efficient
- iii) install facility owned green/clean electrical generators to reduce dependency on the electrical utility grid.

This project provided the additional value of giving Exhibition Place recognition as an environmentally responsible exhibition facility and a leader in energy efficiency, as well as contributing to the City of Toronto's goals for climate change and sustainability.

Energy Efficiencies – 33%

Lighting retrofits

LEED Silver standard for new construction

Green Energy Production – 33%

100 kilowatt PV

Geothermal

One Megawatt PV

“Negawatts” – 33%

Energy Lessons Learned

Exhibition Place

Set Realistic Targets based on Energy Study

Change consumption patterns as a priority

- Building controls

- Environmental Policies

- Central control of lighting, HVAC

- Education & Cooperation

Lighting Projects – Substantial savings plus many positive user attributes

Financial Feasibility

- Look at “bundling” projects

- Private Sector Partnerships

- Other benefits of innovative “green” projects

“Green” is a positive sales promotion for shows & events

How can we help shows & in the end help Exhibition Place reach its targets for waste diversion and energy?

Give Show Producers the tools

- Waste Audit & Diversion Rate by show

- Energy Use by show

- Facilitate purchase of “green” energy

Challenge Show Producers to take Action

- Reference in rental agreements

- Key part of production meetings

- Addressed early & frequently

Reward Show Producers

- Certificate of Achievement

Challenges

Some of the specific challenges we faced and the means we employed to overcome them were:

- a) Replacing existing procedures for new “energy sensitive” operating procedures for the exhibition facility
 - i) Employee buy-in was addressed through educational presentations including the participation of senior level management and the formation of an employee “GreenSmart” team with membership from all areas.
 - ii) Education and buy-in of the show producer and exhibitors was addressed by including the Lighting Policy in the Event Guide and addressed in event production meetings with the show manager and then reminder information to the show producers and exhibitors on the show floor during the event. Detailed information on energy is provided to show producers each year and a recognition program was also developed to provide certificates to show producers who decrease their energy footprint.

Challenges (cont'd)

- b) Retrofitting existing facilities to be more energy efficient
 - i) Funding for projects assisted through various loans and retrofit incentives provided federal, provincial and the City governments and through climate-change agencies.

- c) Installation of facility owned green/clean electrical generators to reduce our dependency on electrical utility grid
 - i) Funding for Photovoltaic (PV) array assisted by the Toronto Better Buildings Partnership (BBP), the Toronto Atmospheric Fund (TAF), and the Federation of Canadian Municipalities (FCM) with an electrical purchase contract obtained with the Ontario Power Authority's (OPA) Renewable Standard Offer Program (RESOP).

Challenges (cont'd)

c) (cont'd)

- ii) Without the expected electrical purchase contract through the OPA's Clean Energy Standard Offer Program (CESOP), the costs of operating the Trigenation Plant were higher than proposed. This is being addressed by running the Trigenation Plant only when there is a sufficient combination of an electrical and heating/cooling load, which typically occurs during events.

This initiative for operating procedure changes was developed in-house and with various consulting partners for the retrofits and generator installations. It was important to determine detailed energy use by building and by show/ event in a base year which was 2005 in order to set objectives and measure results in future years.

Results

Results were measured based on a 2005 baseline. Net electrical usage required to operate exhibition facilities for 2009 was lowered by 39.2% (approximately 9.6 million kilowatt-hours) when compared to the 2005 baseline. Net electrical usage is gross consumption less generation.

The benefits for our customers and for our company included the promotion of Exhibition Place as an environmentally responsible event and exhibition facility.

The objective of the above initiatives was not so much to increase revenue as to decrease greenhouse gas emissions and operating costs. In this regard all of the initiatives described above have been successful.

Results (cont'd)

From a financial perspective, all measures undertaken have resulted in annual savings of approximately \$792,000 CAN. In addition the efficiencies / reductions in electrical use and introduction of “green” technologies have attracted capital grants from various climate change agencies that have totaled approximately \$1.7 million CAN.

Exhibition Place

Gross Exhibition Place Consumption

	2005	2009
Month	[kWh]	[kWh]
January	2,125,945	1,560,964
February	1,641,598	1,395,512
March	2,005,695	1,340,408
April	1,923,570	938,857
May	1,445,646	792,590
June	1,609,669	754,594
July	1,739,298	957,355
August	3,053,303	2,036,871
September	2,662,363	1,794,212
October	2,058,290	1,206,652
November	2,292,646	1,639,409
December	1,906,079	1,248,247
Totals	24,464,101	15,665,672

An additional electrical utility reduction of 3.2% (approximately 795,000 kilowatt-hours) was achieved through the self-production of electricity using green/clean generators.

Exhibition Place Generation

	2009
Month	[kWh]
January	64,391
February	21,343
March	25,987
April	31,785
May	20,400
June	24,279
July	12,148
August	154,838
September	130,826
October	28,912
November	202,184
December	77,735
Totals	794,827

Actions

The measures employed to reach these objectives were:

a) Reduce energy use by amending existing procedures for operating the exhibition facilities

i) Lighting policies

- 1) Indoor lighting is reduced wherever possible to provide for the minimum but adequate lighting levels consistent with the needs of staff, offices and the efficient and effective use of the show space.
- 2) All lighting, except when it is required for security purposes, will be turned off when buildings and facilities are unoccupied, such as the end of the workday for offices and shows or when no activities are in progress. "Off" settings still allow for required emergency lighting levels in accordance with Fire Code.
- 3) Parking lot lighting, where separated from street lighting, will only be on when required for event parking, otherwise it will be off.

Environmental Policies

Exhibition Place

Hall A Lighting

EXHIBITOR

MOVE IN / MOVE OUT

ONLY Level 1 plus
Emergency Lights

Level 1	35
Emergency lights	35

Total Lights 70

SHOW EVENT DAYS

Level 1, Level 2, Level 3 plus
Emergency Lights

Level 1	35
Level 2	66
Level 3	68
Emergency lights	35

Total Lights 204

CLEANING – IATSE - ELECTRICAL WORK

ONLY Level 1 plus
Emergency Lights

Level 1	35
Emergency lights	35

Total Lights 70

Total Kilowatt Hours for an 8 Hour Day if all lights are on = 734 kWh

What does this mean?

SAVINGS kWh

Exhibition Place

Avoided Greenhouse Gas Emissions

	Saving kWh/day	Saving kWh/year	CO ₂ Tonnes	SO _x kilograms	NO _x kilograms
Hall A	1,375	101,750	24.8	6.4	35.4
Hall B	1,191	84,561	20.6	5.32	29.42
Hall C	346	33,450	8.16	2.1	11.6
Hall D	692	17,966	4.38	1.13	6.25
Heritage Court & Swing Space	810	34,830	2.19	2.19	12.12

Total Savings = 272,557 kWh/yr

Actions (cont'd)

- 4) Street lighting will be on half an hour before dusk and one half hour after dawn.
- 5) Façade and Point of Interest Lighting will be “on” as required from dusk to end of show, then off unless required for security.
- 6) Lights for exhibits are turned off outside of show hours.

ii) Escalator and elevator policies:

- 1) Passenger escalators and elevators will be put in service half an hour before the start of a show and be out of service half an hour after the show finishes.
- 2) Freight elevators will be put in service based on the show schedule submitted.

Actions – (cont'd)

iii) Temperature policies:

- 1) Heating and air conditioning constitutes one of the major energy consumption factors and therefore heating and air conditioning levels will be optimized as to mitigate the amount of energy used. The policy provides complete parameters for the heating and cooling seasons as follows:
 - a) Heat will be provided to maintain interior temperatures at approximately 68° F / 20° Centigrade during normal occupied hours.
 - b) During off-hours, or where space is unoccupied, the temperatures may be allowed to drop to as low as 55° F / 12° Centigrade.

Actions – (cont'd)

iii) Temperature policies: (cont'd)

2) Cooling

- a) Cooling is provided to maintain air conditioned facilities at 25° Centigrade during normal occupied hours.
Supply of air conditioning implemented upon door policy being followed.
- b) During off-hours or in unoccupied space the temperatures may rise above this level.

iv) Door policies

- 1) When the interior space of a building is air conditioned, all exterior building envelop roll-up doors and interior man doors that section the floor space are to be defaulted to a closed mode.
- 2) All exterior building envelope man-doors are to remain at the default position of closed. If a particular man-door is required to be operated on a continuous basis, it will be requested by Operations and Exhibition Place Security will key open the door for the defined period of time, then reset.

Actions – (cont'd)

iv) Door policies: (cont'd)

- 3) All roll up doors exceeding 16 feet will be limited year round to opening of 4 meters high – only exception will be during defined periods for movement of large items as authorized by Operations
- 4) Automatically close on timers unless scheduled as open for a defined period by Operations
- 5) Unconditioned areas - doors may remain open if not connected to conditioned space

b) Converted lighting in existing facilities to be more energy efficient

i) Lighting retrofits

Direct Energy Centre retrofit all fixtures and lamps in the main exhibit halls and public Galleria areas with energy efficient, 400 watt, high light output energy efficient, ceramic arch tube" metal halide lamps. This retrofit reduced energy consumption by 2.3 million kWh annually and is estimated to provide an annual savings of 38.7% in the overall lighting costs at Direct Energy Centre.

ii) Energy Control System

An Energy Control System (ECS) by Encilium Technologies Inc. was installed to help offset the energy costs of the 600 fixtures in the Direct Energy Centre underground parking lot. Over 130 motion sensors controlling the lighting zones power required zones only when necessary and detected through motion.

b) Converted lighting in existing facilities to be more energy efficient (cont'd)

iii) Taking Advantage of Natural Light

Allstream Centre uses natural light and lighting levels are independently controlled in each room. Dimmable energy efficient lighting with motion sensors are used throughout.

iv) Lighting Upgrades

Better Living Centre along with Direct Energy Centre has received lighting upgrades by installing energy efficient ballasts and lamps in main Exhibit Halls and public spaces. This will result in an annual reduction of over 2.3 million kilowatt hours of energy use.

v) LED-technology

LED-technology was utilized in exterior building naming signage for Direct Energy Centre and Allstream Centre offering superior energy efficiency.

c) Production of On-Site Clean, Green Energy

i) Wind Turbine

The first urban wind turbine in North America and the first wind turbine in the City of Toronto, it is capable of generating 1 million kilowatt hours of power per year. The turbine also helps to displace some of the harmful chemicals that are responsible for smog and acid rain, removing up to 1,800 tonnes of carbon dioxide annually.

ii) “Keeping it Green”

The “Keeping it Green” program was launched at Exhibition Place to assist our clients in organizing more environmentally friendly shows and events. Clients can purchase Renewable Energy Attributes from Direct Energy Business Services to offset their energy use. The power is sourced from EcoLogo certified generation facilities. The clean, renewable energy sources include wind, solar, low impact hydro, biomass, biodiesel or geothermal power.

Wind Power

Exhibition Place

The turbine was erected in December 2002 in partnership with OSEA, TREC and Toronto Hydro

Power generation began in January 2003



Built by the Dutch company, *Lagerwey Windmaster B.V*

This Urban Wind Turbine is the first of its kind in North America.

c) Production of On-Site Clean, Green Energy (cont'd)

iii) Trigeneration Project

The Direct Energy Centre has a natural gas fired Trigeneration plant that is 80 – 90% efficient and can satisfy approximately 30% of the Centre's electricity, heating and cooling needs. An energy reduction of 7,400 tonnes of equivalent CO₂ emissions occurs through this project.

iv) Photovoltaic Plant

The Horse Palace located on the north end of Exhibition Place uses its 130,000-square-foot flat roof to collect solar energy through a photovoltaic plant. When constructed in 2004, this was the largest PV plant in Canada with plans to expand the plant to a 1 to 2- megawatt photovoltaic generation plant. A 2-megawatt plant would reduce CO₂ emissions annually by 1,906 tonnes.

v) Geothermal Plant

The Press Building is powered using a Geothermal Plant that results in a saving of 110,000 kilowatts-hours per year of electricity and over 15,000 cubic meters of natural gas. The Geothermal Plant has reduced the annual carbon dioxide (CO₂) emissions of the Press Building by approximately 125 tonnes per year and is expected to be 100% efficient.

Integrated Lighting Control System

Exhibition Place

The Direct Energy Centre (DEC) hosts over 180 events annually. Depending on the size of the event, occupancy can range from a few cars to a completely full garage.

➤ The **Energy Control System (ECS)** by **Encilium Technologies Inc.** was installed in the summer 2008 to help offset the energy costs of the 600 fixtures in the DEC underground parking lot.

➤ The ECS includes over 130 sensors controlling the lighting zones, increasing automation of the system.

➤ The ECS improves lighting controls by increasing the number of zones within the garage to 26.

➤ When a sensor detects movement, the non-emergency lighting circuits are activated within the corresponding lighting zone.

➤ The lights within a zone remain powered until the corresponding sensors detect no motion for a programmable amount of time.

➤ Energy is saved as a result of powering only required zones.



Green Smart Program

Exhibition Place

2009 – Launch of Exhibition Place
GREENSmart program

Created to represent both conservation and
energy creation mandate at Exhibition
Place

Act as a “stamp of approval” for new
programs or audiences

March 2009 – “*Keeping it Green*” program for
all clients

Energy offset program through our naming
partner Direct Energy Business –
purchase *Renewable Energy Attributes*
equivalent to energy used by show

