



## STAFF REPORT ACTION REQUIRED

### City Electricity Purchase Strategy - Green Power

<b>Date:</b>	February 4, 2008
<b>To:</b>	Budget Committee
<b>From:</b>	Chief Corporate Officer
<b>Wards:</b>	All
<b>Reference Number:</b>	P:\2008\Internal Services\F&re\Bc08017F&re - (AFS 6021)

#### **SUMMARY**

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This report outlines a short term strategy for the purchase of green electricity and recommends that a report be prepared for the Executive Committee in September 2008 on a more detailed strategy to meet the City's target of obtaining 25 per cent of its electricity needs from green power sources.

#### **RECOMMENDATIONS**

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**The Chief Corporate Officer recommends that:**

1. City Council authorize the purchase of a sufficient amount of green electricity to meet the electricity usage requirements of City Hall on an annual basis commencing July 2008.
2. The Chief Corporate Officer start discussions with Toronto Hydro Energy Services and possibly other suppliers, including community groups, regarding partnership opportunities to develop green power projects which could be directed to the City's green power targets.
3. The Chief Corporate Officer report back to the Executive Committee for its September 2008 meeting with a recommended long-term strategy for the City's target of obtaining 25 per cent of its electricity from green power sources.

## **Financial Impact**

The 2008 Recommended Operating Budget includes an allocation of \$500,000 in the Non-Program Budget to purchase green electricity. The allocated amount is sufficient to purchase green power for the electricity requirements at City Hall for a one year period starting in 2008.

The City has not purchased any green power to date. Presently, the amount of available green power from new installations is very limited. Therefore the City's green power purchases would have to be phased in over a number of years and would most likely have to come from independent suppliers under long term contracts. The Chief Corporate Officer will report back with a plan to purchase additional green power to meet the City's green power target of 25% in time for consideration with the 2009 Budget process.

If green power is purchased incrementally at 6.25 percent per year over four years, the first year cost for City programs would range from \$1.5 million to \$3.4 million; and \$0.83 million to \$1.83 million for the ABCs. This is a 40 percent to 100 percent premium over conventional electricity. Overall, the City's electricity costs would increase by 1.8 to 4.0 percent in the first year.

If enough green power was available for purchase, the cost of purchasing 25% of the City's electricity requirements from green power sources would range, depending on the type of green power purchased, from \$6.17 million to \$13.57 million annually for City Divisions and \$3.34 million to \$7.34 million annually for the City's ABCs, for a total cost ranging from \$9.51 million to \$20.91 million, which would represent an overall increase of 7.0 to 16.0 percent of the City's electricity cost.

The Deputy City Manager and Chief Financial Officer has reviewed this report and agrees with the financial impact information.

## **DECISION HISTORY**

At its meeting of July 16, 17, 18 and 19 2007, Council adopted Report No. EX10.3 titled "Climate Change, Clean Air and Sustainable Energy Action Plan: Moving from Framework to Action", which included the following recommendation:

- "2. City Council establish the financial resources required to support the actions necessary to achieve these emission reduction targets and that City Council:
  - (e) direct the Chief Corporate Officer to develop a plan to achieve the City's target of obtaining 25 percent of the City's electricity needs from green energy sources over a four year phase-in period starting in 2008"

To date the City has not purchased any green power due to high premium costs associated with green power. However, the City has implemented a series of retrofit projects that reduces electricity consumption and demand.

## ISSUE BACKGROUND

The City's "Clean, Green and Healthy – A Plan for an Environmentally Sustainable Toronto" plan and the City's "Toronto Intergovernmental Declaration on Clean Air" in June 2000 included a commitment to purchase 25 percent of its electricity needs from green power sources.

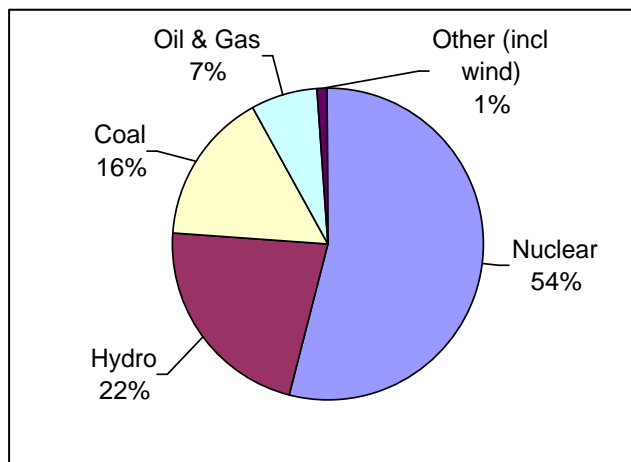
## COMMENTS

The City's commitment to purchasing 25 percent green electricity is based on the desire to reduce the City's contribution to greenhouse gases and to accelerate the development of new, green and renewable energy in Ontario. When purchasing green electricity it should be clear that the purchase will spur the development of new green power generation or reduce conventional generation.

### Green Power Availability

The total electrical generating capacity in the Province of Ontario is approximately 27,000 megawatts (MW). The Province's goal is to have 10 percent of the total (2,700 MW) sourced from green power generators by 2010 and included in the supply mix for all electricity consumers in the Province. Currently about 4.0 percent of the supply mix is being generated from green power sources with the majority coming from small hydro generators and the remainder coming from wind and other renewable sources. This green power is sold directly to the Ontario Power Authority (OPA) and is not available for purchase by the City.

The overall electricity generation in the Province in 2006 was as follows:



There are a small number of green power producers in the Province from where the City could purchase green electricity, however the amount of available green power from new installations is very limited. To increase the amount of available green power the City could enter into long-term contracts with suppliers so that the suppliers could build

additional green power assets with the City guaranteeing to buy the power. The process for building new green power assets in the Province could take two to three years.

### Green Electricity Costs

Environment Canada’s Environmental Choice Program (ECP) certifies three types of green power: Type I – electricity generation from a facility that began operations prior to 1991; Type II – electricity generation from a facility from January 1, 1991 – March 31, 2001 and; Type III – electricity generation from a facility that began operating after April 1, 2001. ECP certified electricity is authorized to use the EcoLogo designation

Based on a survey of the market, the price premium for green electricity can range from 2.5 cents per kilo-watt-hour (kWh) for Type I and II green power to 5.5 cents per kWh for Type III. This is a 40 percent to 100 percent premium over conventional electricity.

### Purchasing 25 percent Green Electricity

Based on the current green electricity premiums, purchasing 25 percent of the City’s Divisions’ electricity from green power sources would add a cost premium of approximately \$6.17 million to \$13.57 million annually (depending on the type of green electricity purchased). The ABCs would add another \$3.34 million to \$7.34 million annually as a cost premium to their utility budget for green electricity. If green electricity is purchased incrementally at 6.25 percent per year over four years the first year cost for City Divisions would range from \$1.5 million to \$3.4 million; and \$0.83 million to \$1.83 million for the ABCs.

The following table shows the cost premium for green power for each year based on current pricing to arrive at 25 percent by 2011 for the City divisions and ABCs:

City Divisions & ABCs	Annual kWh Consumption	Year	Green Power Quantity		Green Power Cost	
			Cumulative Percent Purchase	Quantity (kWh)	Type II (2.5 c/kWh)	Type III (5.5 c/kWh)
City Divisions	987,247,000	2008	6.25%	61,703,000	\$1,543,000	\$3,394,000
		2009	12.50%	123,406,000	\$3,085,000	\$6,787,000
		2010	18.75%	185,109,000	\$4,628,000	\$10,181,000
		2011	25.00%	246,812,000	\$6,170,000	\$13,575,000
ABCs	533,809,000	2008	6.25%	33,363,000	\$834,000	\$1,835,000
		2009	12.50%	66,726,000	\$1,668,000	\$3,670,000
		2010	18.75%	100,089,000	\$2,502,000	\$5,505,000
		2011	25.00%	133,452,000	\$3,336,000	\$7,340,000

Putting these numbers into context; the City’s overall electricity costs would increase by 1.8 to 4.0 percent in the first year if green power is purchased incrementally at 6.25 percent each year.

As mentioned above, the availability of green or renewable energy in the Province is very limited since most of the green power is purchased by the OPA and is included in the Province's supply mix. Due to this limited availability the City's green power purchases would have to be phased in over a number of years and would, most likely, have to be purchased from independent suppliers under longer term contracts.

## **City Hall**

As part of the "Climate Change, Clean Air and Sustainable Energy Action Plan: Moving from Framework to Action" report City Council reaffirmed that City Hall should become a showcase for sustainability.

City Hall has undergone several energy efficiency upgrades including a new building automation system, lighting equipment and new lighting controls. In 2008 City Hall will also be connected to Enwave's deep lake water cooling (DLWC) system which will further reduce electricity use in the building. The DLWC system is a renewable energy technology that uses cold water from Lake Ontario to provide cooling for buildings in the downtown core.

As part of the project to make City Hall a showcase for energy efficiency additional energy efficiency upgrades are planned over the next four years including new mechanical equipment, new windows and advanced lighting controls.

In order to demonstrate the City's leadership and to take steps to allow City Hall to become a showcase for sustainability it is recommended that the City purchase green electricity for the all the requirements at City Hall for a one year period starting in 2008. The 2008 Recommended Operating Budget includes an allocation of \$500,000 in the Non-Program Budget to purchase green power.

City Hall is a large user of electricity consuming approximately 20 million kWh each year. The cost to purchase green power for a full year for City Hall is estimated to be \$500,000.

There are many benefits to a green power purchase for City Hall:

- City Hall is the City's most recognizable building
- demonstrates environmental leadership
- can be used in a communications plan to educate the public on the benefits of 'going green'
- the electricity use at City Hall will produce zero emissions
- reduction in harmful emissions such as sulphur dioxide, nitrogen oxide and carbon dioxide, is equivalent to taking 520 passenger cars off the road
- provides support to a developing renewable energy industry

City Hall would pay the green power supplier the cost premium separately and in addition to the regular hydro bill from Toronto Hydro.

## Demand Side Management and Renewable Generation

To date Demand Side Management (DSM) initiatives have been given priority consideration in reducing CO2 emissions. Several DSM projects have been completed or are currently underway in many City facilities. Renewable energy projects such as Deep Lake Water Cooling (DLWC) have been implemented at Metro Hall and will soon be supplying City Hall, Police Headquarters and Old City Hall.

It should be noted that the City has also implemented several other renewable energy projects in 2006/2007 including the installation of solar energy walls at three City facilities, solar heating at three City pools, and 5 other solar installations as part of ongoing energy retrofits in City facilities. (It should be noted that solar thermal projects produce renewable energy but do not produce green electricity). Additional renewable energy projects are being planned in 2008. The City's agencies, boards and commissions are also undertaking projects of their own, such as the installation of solar power on the Horse Palace at Exhibition Place.

The following is a partial list of the DSM, DLWC and renewable generation projects in the City along with electricity kWh reductions. These projects will result in a reduction of about 54 million kilowatt-hours (kWh) annually or 5.6 percent of the City divisions' electricity requirements. This would have represented an equivalent purchase of approximately \$2.0 million annually of green power for the City.

City Divisions & ABCs	Project Name	Project Type	Completion Date	Electricity kWh Avoidance (approx)
City Divisions	Civic Centres	Retrofit/DSM	2006	6,112,000
	City Arenas	Retrofit/DSM	2007	9,247,000
	Firehalls	Retrofit/DSM	2007	1,049,000
	Community Centres	Retrofit/DSM	2008	7,000,000
	Transfer Stations	Retrofit/DSM	2008	300,000
	Police Facilities	Retrofit/DSM	2008	1,500,000
	Traffic Lights	Retrofit/DSM	2012	20,000,000
	Metro Hall DLWC	Renewable	2006	4,000,000
	Old City Hall DLWC	Renewable	2009	960,000
	City Hall DLWC	Renewable	2008	2,893,000
	Police HQ DLWC	Renewable	2008	1,000,000
	Fire Hall PV	Renewable	2007	4,000
	Subtotal City			
ABCs	Exhibition Place Retrofit	Retrofit/DSM	2007	350,000
	Exhibition Place DEC Lighting	Retrofit/DSM	2006	2,752,000
	Exhibition Place PV	Renewable	2006	100,000
	Toronto Public Library	Retrofit/DSM	2003	4,459,000
	Subtotal ABCs			
<b>Total</b>				<b>61,726,000</b>

note: this is not an inclusive list of all the DSM projects in the City or the ABCs

City staff have and will continue to investigate options for undertaking energy-related capital projects, including demand side management (DSM) initiatives, as a means of reducing the City's electricity consumption.

### **Investment in Green Power Projects**

Since there is limited green electricity available in the market and considering the high cost of purchasing green power, it is recommended that the City investigate the possibility of partnering with Toronto Hydro Energy Services Inc. and possibly others including community groups in the development of green power production facilities whereby the City would commit to purchase the green power output in return for a capital investment.

The City has potential green power resources at the Ashbridges Bay Treatment Plant, Green Lane Landfill, the Dufferin Waste facility and others that could contribute to the City's green power targets. Toronto Hydro Energy Services Inc. is actively involved in investigating and/or developing renewable energy production at these facilities and the City has the opportunity to work with Toronto Hydro to direct these projects towards the City's green electricity purchase targets.

It is recommended that the Chief Corporate Officer, start discussions with Toronto Hydro Energy Services Inc. and possibly other suppliers, including community groups, regarding partnership opportunities to develop green power projects which could be directed to the City's green power targets.

### **Benefits of Green Power Purchase**

The benefits of purchasing green power include:

- reduces the harmful emissions associated with using conventional electricity. The Province's electricity supply mix, includes burning coal to generate electricity, which results in significant green house gas emissions. Renewable energy does not produce any greenhouse gas emissions.
- air quality improvements.
- provides support to a developing renewable energy industry.

If the City purchased 25 percent of its electricity requirements from green power sources a reduction of green house gas (CO<sub>2</sub>) emissions of approximately 92,000 tonnes would result.

## **Conclusions**

It is recommended that the City take a strategic approach to meet its green electricity purchase targets including:

- purchasing green electricity for City Hall
- investigating green power development projects that could be used towards the City's target
- continuing and expanding the City DSM efforts including renewable energy assets in its facilities through various programs such as the Energy Retrofit Program.
- developing a long-term renewable energy strategy for the ABCD's buildings and streetlighting electricity requirements. The aim of this strategy is to enable the City to reduce greenhouse gas emissions, increase security of supply and stimulate the development of renewable energy in Ontario.

## **CONTACT**

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## **SIGNATURE**

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