

**Solar Photovoltaic Program for City Facilities**

<b>Date:</b>	June 2, 2010
<b>To:</b>	Executive Committee
<b>From:</b>	Chief Corporate Officer
<b>Wards:</b>	All
<b>Reference Number:</b>	P:\2010\Internal Services\Fac\Ec10011Fac (AFS 11827)

**SUMMARY**

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This report recommends the approval of a pilot program between the City and Toronto Hydro Electric Services Ltd. for the installation of solar photovoltaic panels on City-owned buildings. Under the program, the City would own up to 49% of the panels, with Toronto Hydro owning the balance. The report requests Council's authority to amend the Sustainable Energy Plan 2010 Approved Capital Budget and the 2011 to 2019 Capital Plan by reallocating \$8 million included in the Toronto Energy Conservation Fund to a new project, the Solar Photovoltaic Program, with zero net impact corporately.

This report advises that a competitive process will be utilized to licence the use of City-owned roof space to private sector solar developers on buildings not selected for the City-Toronto Hydro pilot program. This report also advises that, depending on the availability of funds, the City may in the future continue to install its own solar installations on City facilities. In addition, this report recommends that roof space on smaller City-owned facilities be made available at a nominal fee to community-based solar co-operative groups.

**RECOMMENDATIONS**

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**The Chief Corporate Officer recommends that:**

1. Authority be granted for the City to enter into an agreement with Toronto Hydro Electricity System Limited for a solar photovoltaic (PV) program substantially on the terms described in this report and as set out in Attachment 1 and other such terms and conditions as may be deemed appropriate by the Chief Corporate Officer, and in a form satisfactory to the City Solicitor, and that the Chief Corporate Officer be authorized to execute any related agreements on behalf of the City.

2. City Council authorize the reallocation of funds in the 2010 Approved Capital Budget and 2011 to 2019 Capital Plan from the Energy Conservation Reserve Fund to a new project, the Solar Photovoltaic Program, within the Sustainable Energy Plan in the amount of \$4 million in 2010 and \$4 million in 2011, as set out in Attachment 2.
3. Licenses to community-based solar co-operative groups for the installation of solar PV panels on City-owned facilities be granted for nominal value.

### **Financial Impact**

The approval of this report will result in the reallocation of a total of \$8 million; \$4 million in 2010 and \$4 million in 2011 from within the Approved 10-Year Capital Plan for the Sustainable Energy Plan, from the Toronto Energy Conservation Fund to a new project, the Solar Photovoltaic Program, for a net \$0 impact.

The OPA contract will provide a revenue stream for 20 years, in the amount of approximately \$0.800 million annually. This revenue will be paid back into the Sustainable Energy Plan, the Solar Photovoltaic Program. In addition, Toronto Hydro will pay the City a fee of 4% of the revenue from the installations in exchange for the use of City roof space. This revenue will also be paid into the Sustainable Energy Plan. After that 20-year period, the installations are expected to operate for approximately 10 years, which would provide free electricity to the City during that period.

The estimated simple payback period for the program is approximately 10 years. Operating costs are anticipated to be minimal.

It might be possible to access additional funding for this program from Ontario Power Authority programs that are currently under development, as well as from other sources. Staff will pursue these opportunities as details regarding eligibility emerge.

The private sector component of this program will produce revenues through fees for the use of City roof space. The fees will be established through a competitive tendering process.

In future years, subject to the availability of funds in the Capital Budget, the City may continue to undertake its own solar installations on City facilities. These will be synchronized with State of Good Repair re-roofing budgets.

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

## DECISION HISTORY

The Power to Live Green: Toronto's Sustainable Energy Strategy (Exec 36.9) contained the following recommendation:

- 4 c. Direct the Deputy City Manager and Chief Financial Officer to coordinate the actions necessary, including accessing the Feed-in Tariff, that will see by 2020 the installation of renewable energy systems, where feasible, on all City owned buildings and properties, and the Deputy City Manager and Chief Financial Officer or his designate be authorized to execute all agreements necessary to access the Feed-in Tariff.

<http://www.toronto.ca/legdocs/mmis/2009/cc/decisions/2009-11-30-cc42-dd.htm>

## ISSUE BACKGROUND

The City of Toronto has a long history of leadership in the field of renewable energy. Examples include renewable energy installations such as North America's first urban wind turbine at Exhibition Place; renewable energy programs such as the Toronto Solar Neighbourhoods Initiative; and policy initiatives such as the Renewable Energy bylaw. Several large-scale renewable projects, such as those at Ashbridge's Bay Treatment Plant and the Green Lane Landfill, are currently under development. Toronto is also the largest government purchaser in Canada of electricity from Bullfrog Power, a retailer of energy generated by renewable sources.

In 2009, the Province adopted the *Green Energy and Green Economy Act*. Among other things, the Act created a Feed in Tariff (FIT) program, through which the Ontario Power Authority (OPA) will contract with producers of renewable electricity to purchase that power for a premium price. Prices for electricity produced by rooftop-mounted photovoltaic panels are higher than for any other form of renewable electricity, which has led to a dramatic increase in interest in installing solar technologies. In Toronto alone, there have been over 100 contracts awarded to solar power developers by the OPA. Four of these contracts are for City projects:

- A 50 kilowatt (kW) system on the Police Services facility at 9 Hanna Ave.
- A 20 kW system on the Toronto Parking Authority's St. Lawrence Garage
- An 86 kW system on Toronto Water's F.J. Horgan Water Treatment Plant.
- A 100 kW system on the Horse Place at Exhibition Place

The City also applied to the OPA's microFIT program for PV systems under 10KW in size, for two small systems on Fire Halls:

- A 3.2 kilowatt system at FH 334 at 339 Queens Quay W.
- A 1.2 kilowatt system at FH 424 at 462 Runnymede Rd.

In order to further respond to Council's direction, and to take advantage of the FIT program, City and Toronto Hydro staff have entered into discussions to develop a joint pilot program that will result in the installation of solar PV on a significant number of City-owned buildings in 2010 and 2011. Other solar PV program streams for City facilities are also being developed, as outlined below.

## COMMENTS

### Pilot Program with Toronto Hydro

In February of this year, the Vice-President of Toronto Hydro wrote to the Chief Corporate Officer proposing a partnership arrangement for the use of roof space on City-owned buildings for solar photovoltaic installations. City and Toronto Hydro staff have met on several occasions since then to discuss the proposal. The attached draft term sheet provides more details.

The Toronto Hydro proposal calls for an 18-month pilot program (to the end of 2011) whereby both parties will jointly develop solar PV installations on rooftops that are greater than 20,000 square feet in area, totalling up to 400,000 square feet. The City will invest in and own up to 49% of the installations, up to a maximum investment of \$8 million. Toronto Hydro will own the balance. In return, the City will receive between 25% and 49% of net income, according to its ownership share, from the sale of electricity to the OPA under the FIT program. The current price paid by the OPA for electricity generated by solar photovoltaic installations between 10 and 250 kW is 71.3 cents per kilowatt hour. In addition, Toronto Hydro will pay the City 4% of the revenue as a fee for its use of City roof space. The payback period on the City's investment in this scenario is approximately ten years.

The program will result in the installation of approximately two Megawatts (MW) of generation capacity, which would in turn generate approximately two million kilowatt hours (kWh) of electricity annually. This is roughly equivalent to the electricity consumption of 200 households. The resultant reduction in greenhouse gas emissions will be approximately 400 tonnes per year.

A solar PV partnership between the City and Toronto Hydro has many advantages. It will allow the City to obtain an ownership position in PV installations without taking all of the development risks. It will align the interests of both organizations, and allow them to take advantage of each others' expertise, as well as providing access to possible additional funding programs and tax advantages that would not be available to the partners individually. Staff from both organizations have worked together on a number of initiatives in the past, including the development of "The Power to Live Green: Toronto's Sustainable Energy Strategy", and have established positive working relationships.

The pilot program will include a management structure that will establish joint project teams for each solar installation, and a joint management committee to oversee the operation of the entire program. Details of the program will be developed by both parties, subject to the approval of the Chief Corporate Officer, and in a form satisfactory to the City Solicitor.

Council has in the past approved a number of arrangements with Toronto Hydro for both energy efficiency and renewable energy projects. Approval was recently granted for Exhibition Place to sole-source the installation of a large solar PV installation on the roof of the Better Living Centre to Toronto Hydro; a similar arrangement was also made by

the TTC for solar PV on the roof of a bus garage. Currently, Toronto Hydro is authorized to carry out 30 – 40% of energy retrofit projects on City buildings.

The Ontario Power Authority is scheduled to evaluate the Feed in Tariff program in September, 2011. It is generally acknowledged that the prices offered for electricity generated from solar PV will be reduced at that time, if not before. Similar reductions in solar PV price offerings were recently announced by the government of Germany, which is one of the leading jurisdictions in the world in supporting solar power. Timely development of FIT applications is necessary in order to ensure the City maximizes its revenues from solar PV projects.

The City and Toronto Hydro will conduct assessments of building roofs to identify those with the best solar energy potential, addressing issues such as shading and conflict with other roof-mounted equipment. The assessment will also ensure that proposed installations adhere to the Green Roof policy for City buildings.

A key objective of the program will be to coordinate solar installations with major roof reconstruction work scheduled under State of Good Repair programs. In most cases, roofs need to be either new or recently replaced in order to support solar PV. It is important to avoid having to temporarily remove solar installations during the life of the 20-year OPA contract to carry out roof reconstruction or repairs, as this can be a costly exercise. As well, any additional loading issues the installations create must be addressed.

Following the completion of the pilot program at the end of 2011, staff will evaluate the merits of the co-ownership model, and assess the impact of potential developments such as changes in solar technology and the conditions of the Feed in Tariff program. Consideration will be given to expanding eligibility for participation in solar PV co-ownership with other partners.

Subject to the availability of funds, staff will also investigate the possibility of installing 100% City-owned solar technologies on roofs that are not part of the City/Toronto Hydro program or the programs outlined below.

## **Process for Assigning City Roof Space to the Private Sector**

The proposed terms of the City/Toronto Hydro solar program will allow opportunities for private sector solar developers. The program will utilize roofs that are over 20,000 square feet in size. Private sector solar companies will therefore be invited to bid to install solar PV on City-owned roofs below this size.

The total roof space required for the City/Toronto Hydro program will be approximately 400,000 square feet. Once roofs totalling up to this size have been approved, those remaining rooftops over 20,000 square feet that were not selected for the City/Toronto Hydro program can be released for private bids. Installations will be 100% owned by the private company; the City will receive revenues from license fees in exchange for the use of City roof space.

As noted above, staff intend to synchronize solar installations with state of good repair re-roofing programs so that a number of newly-repaired roofs will become available for solar installations on an annual basis.

## **Community Organizations**

There is a growing interest in a number of communities across the city in using smaller City buildings for cooperatively-owned solar projects. These groups often consist of residents who are interested in solar energy, but are unable to install systems on their own homes due to financial constraints, roof structural issues, shading problems, etc. Solar cooperatives generally sell shares to members in order to raise the capital necessary to install the system, then distribute the revenue from the sale of electricity back to the members. Changes introduced by the *Green Energy Act* make it easier for cooperatives to engage in renewable energy generation.

Typically, solar cooperatives are interested in roofs under 5,000 square feet in size. Due to the economies of scale involved in solar installations, these roofs are unlikely to be of interest to private solar developers.

At its meeting of May 11 and 12, 2010, Council adopted Executive Committee Report 43.7, "Delegation of Authority in Certain Real Estate Matters". The report delegated authority for certain City officials to approve leases/licenses where the City is the landlord/licensor, and where total compensation does not exceed a certain level. The Chief Corporate Officer will use the above-noted delegated authority for these projects as well, where conditions are appropriate for solar installations. In order to facilitate such projects, it is recommended that the license fee for use of the roof space be set at a nominal amount; however, it is not anticipated that there will be any other costs to the City as a result of this program.

## **CONTACT**

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## **SIGNATURE**

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Bruce Bowes, P. Eng.  
Chief Corporate Officer

## **ATTACHMENTS**

1. Term Sheet for Business Arrangement
2. Budget Adjustment to create new capital project