TORONTO STAFF REPORT

April 5, 2006

To: Policy & Finance Committee

From: Chief Corporate Officer

Subject: Status Report on the Energy Plan for Toronto
All Wards

Purpose:

This status report addresses the consumption of electricity and natural gas by the broader Toronto community ("Toronto"), as well as consumption within Toronto's municipal government corporation ("the City"). The information contained in this report will be used to aid in the development of the Energy Plan for Toronto.

Financial Implications and Impact Statement:

There are no financial implications associated with this report.

Recommendations:

It is recommended that this report be received for information.

Background:

In December 2005, the Ontario Power Authority presented its "Supply Mix Advice Report" to the Minister of Energy regarding options for the future development of Ontario's electricity system. This action was in response to a request from the Minister on May 2, 2005 for advice on the appropriate mix of electricity supply sources to satisfy the expected demand in Ontario, taking into account conservation targets and new sources of renewable energy out to 2025.

The Independent Electricity System Operator, in its 18-Month Outlook report dated December 22, 2005, concluded that Toronto could begin to experience blackouts in the summer of 2008 if no action is taken to address the demand-supply balance of the city.

City Council at its meeting of January 31 to February 2, 2006 adopted a motion requesting the Deputy City Manager and Chief Financial Officer to report to the February 20, 2006 meeting of

the Roundtable on the Environment on a draft terms of reference for an Energy Plan for Toronto (the "Energy Plan"), directing that these terms of reference be developed in consultation with Toronto Hydro Corporation, Toronto Hydro Energy Services Inc., Enwave Energy Corporation, the Toronto Atmospheric Fund and the City's Energy Efficiency Office.

On February 10, 2006, Ontario's Energy Minister announced support for a 550 Megawatt plant to be built in the Port Lands area of Toronto, the first phase of which is expected to be completed by 2008. The Minister also announced the government's intention to target a reduction in the city's electricity demand of 300 Megawatts over the same timeframe through conservation and demand management initiatives.

At its meeting of February 20, 2006, the Roundtable on the Environment received the draft terms of reference for the Energy Plan, along with proposed additional recommendations to be considered by the Policy and Finance Committee.

Comments:

This update report addresses the consumption of electricity and natural gas by the broader Toronto community as well as consumption within the City of Toronto's Divisions, Agencies, Boards and Commissions. Related carbon dioxide emissions are also reported on due to their potential impact on climate change. Other energy forms will be reported on as the information becomes available.

The ultimate objective is to integrate all relevant information within the overall Energy Plan so that the most effective strategies can be developed to yield the greatest amount of conservation and demand management results for Toronto. All other matters pertaining to the Energy Plan, including a report from IndEco Strategic Consulting (the external technical and professional services firm engaged by the City) will be addressed in a June 20, 2006 report to the Policy and Finance Committee.

The findings and conclusions documented in this report follow several consultation meetings with senior staff of Enwave Energy Corporation, Toronto Hydro Corporation and its retail subsidiary (Toronto Hydro Energy Services Inc.), and the Toronto Atmospheric Fund. Consultation sessions were also held or are being arranged with a broad range of major stakeholders including Natural Resources Canada, Ontario Power Authority, the Independent Electricity System Operator, Hydro One, Enbridge Gas Distribution, Toronto District School Board, the Toronto Catholic District School Board, and Green$aver.

(1) Energy Usage in Toronto

Data pertaining to electricity and natural gas consumption have been collected and are presented in report Appendices A – L. Appendices M and N provide an estimate of electricity-related greenhouse gas emissions for 2005 and natural gas-related emissions for 2004.

(2) Electricity Demand During 2005

Data obtained from Toronto Hydro-Electric System Limited ("THESL") indicates that in 2005, total electricity peak demand for the Community was 4,936 Megawatts in 2005. Peak demand is defined as the highest rate of consumption at a given time.

Hydro One estimates summer peak load growth at a rate of 1.62 per cent on average for each year over the next 12 years in Central Toronto (comprising of the former Borough of East York, former City of York and the former City of Toronto), while THESL has projected total load growth of approximately 1 per cent annually for the city. Such demand growth factors, along with THESL's Leaside and Manby transformer facilities nearing their peak capacity, has resulted in a confirmation from THESL that there is a need for new generation within the city of approximately 250-350 Megawatts, in combination with 200-300 Megawatts of conservation and demand management measures (by 2008-2010).

In its 18-Month Outlook report (dated December 22, 2005), the Independent Electricity System Operator concluded that Toronto could begin to experience rotating blackouts in the summer of 2008 if no action is taken to address the demand-supply balance of the city.

(3) Electricity Consumption

The subsections below are divided into electricity consumption by the city as a whole, and by City Divisions and ABCs. Detailed data are provided in report Appendices A – F.

(a) Toronto

THESL has indicated that electricity consumption for Toronto in 2005 was 26,372,169 Megawatt hours at a cost of $2.69 billion. Consumers of electricity are classified into three categories:

(i) residential users, or households (i.e. single residences and multiple residences up to six units), accounting for 22 per cent of total consumption;
(ii) large users, or customers with monthly peak demands of 5,000 kilowatts or greater, accounting for 10 per cent of total consumption; and
(iii) general service users, or consumers not classified as either household residential or large users and are typically small businesses and "bulk-metered" multi-unit residential establishments, accounting for 68 per cent of total consumption.

Data pertaining to electricity consumption for the city, are presented in report Appendices A and B.

(b) City Divisions and Agencies, Boards & Commissions

Data obtained from the Facilities and Real Estate Division's Energy and Waste Management Office indicates that the total electricity consumption for 2005 by City Divisions and ABCs was 2,043,519 Megawatt hours at a cost of $177 million, representing approximately eight per cent of

the electricity consumption in the city as a whole. City Divisions consumed 999,860 Megawatt hours, at a cost of approximately $86 million, representing approximately four per cent of the total actual electricity consumption in Toronto, while City ABCs consumed 1,043,659 Megawatt hours, at a cost of approximately $91 million, representing approximately four per cent of the total actual electricity consumption in Toronto.

The highest electricity consumer within City Divisions is Toronto Water with 571,254 Megawatt hours or 57 per cent of the total electricity consumption by City Divisions followed by Parks and Recreation with 120,028 Megawatt hours or 12 per cent of the total electricity consumption by City Divisions.

The highest electricity consumer within the City Agencies, Boards and Commissions is the Toronto Transit Commission with 452,669 Megawatt hours or 43 per cent of the total electricity consumption of City ABCs, followed by the Toronto Community Housing Corporation with 427,746 Megawatt hours or 41 per cent of the total electricity consumption of City ABCs.

Detailed data are provided in report Appendices C – F.

(4) Natural Gas Consumption

The subsections below are divided into natural gas usage by the city as a whole, City Divisions and its ABCs. Detailed data are provided in report Appendices G – L.

(a) Toronto

Enbridge Gas Distribution provided information indicating that the natural gas consumption in the city as a whole, in 2004, was 4,323,001,973 m^3. This data is classified in four categories:

(i) residential users, accounting for 34 per cent of total consumption;
(ii) apartment users, accounting for 20 per cent of total consumption;
(iii) commercial users, accounting for 29 per cent of total consumption; and
(iv) industrial users, accounting for 17 per cent of total consumption.

Detailed data are provided in report Appendices G and H.

(b) City Divisions and Agencies, Boards & Commissions

Data obtained from the Facilities and Real Estate Division's Energy and Waste Management Office indicated the total natural gas consumption for 2005 by City Divisions and ABCs was 138,378,879 m^3 at a cost of approximately $55.4 million of which:

(i) City Divisions consumed 42,504,148 m^3, at a cost of approximately $18.1 million; and
(ii) City ABCs consumed a total of 95,874,731 m^3, at a cost of approximately $37 million.

Detailed data are provided in report Appendices I – L.

(5) Summary of Greenhouse Gas Emissions

Carbon dioxide emissions associated with the electricity consumed in the city as a whole have been estimated at approximately six million tonnes for 2005. Carbon dioxide emissions for natural gas consumed in the city as a whole were estimated at approximately eight million tonnes in 2004.

Detailed data are provided in report Appendices M and N.

(6) Conservation and Demand Management

The City of Toronto's leadership position respecting energy efficiency and conservation is well known locally, nationally and internationally, as recognized by Business Week when the City received the Low Carbon Leader 2005 award from the Climate Group.

There are currently several organizations involved in the design, development and delivery of Conservation and Demand Management (CDM) programs and projects in the city as a whole. After a rigorous review, it was concluded that a greater co-ordination among the various organizational entities would assist in addressing existing barriers to the effective and efficient delivery of CDM programs.

The City of Toronto's Energy Efficiency Office/Better Buildings Partnership, THESL and Natural Resources Canada, among others, have recognized the significant benefits of reducing duplication of effort in the delivery of programs locally and have started to address this issue by executing joint Agreements for the delivery of certain programs. An excellent example of this cooperation is demonstrated through the Better Buildings New Construction Program, in which these three entities cooperate in the local co-ordination of candidate buildings for the Commercial Building Incentive Program, which is a Natural Resources Canada program.

This cooperative effort significantly reduces the level of effort required of developers who wish to participate in the program, reduces administrative cost through streamlining of processes, improves the participation rate and minimizes the appearance of competing programs and entities. It is therefore highly desirable that where feasible, the CDM programs relating to the Energy Plan be implemented through cooperation with the various entities such as the Ontario Power Authority, THESL, THESI, Enwave Energy Corporation and the Toronto Atmospheric Fund.

The scale of energy conservation and demand management initiatives underway in the city is illustrated by participation in the Energy Retrofit Program (including City Divisions, Agencies, Boards and Commissions) and the Better Buildings Partnership which now approaches 500 retrofitted buildings totalling 39 million square feet and cumulative utility cost reductions of approximately $200 million. The cumulative carbon dioxide emissions reductions for these projects amount to over one million tonnes.

(7) Minister's Directive dated February 10, 2006 to the Ontario Power Authority (OPA)

In a Ministerial Directive to the OPA (February 10, 2006), the Ontario Minister of Energy authorized 300 Megawatts of CDM in the city as a whole, to be realized by 2010. In order to achieve 300 Megawatts of additional, measurable and verifiable CDM, it is desirable for the City, THESL and the OPA to reach agreement regarding methodologies, programs and delivery arrangements that will achieve both the Minister's target and minimize the potential for rotating blackouts in the city as a whole during 2008 to 2010.

Furthermore, a 10 Point Green Plan for the Port Lands, as presented to the City's Roundtable on the Environment on February 20, 2006, proposes CDM results exceeding 750 Megawatts, which could make a significant contribution to the Energy Plan for Toronto. The amount of conservation and demand management that could be realized by 2008 exceeds the targeted reduction of 350 Megawatts, as illustrated in report Appendix O. This would potentially reduce the need for building additional, large, centralized generation projects in the City of Toronto.

The 10 Point Green Plan for the Port Lands also stated that the plan would "produce new energy, create more jobs, reduce energy bills, cut energy waste and reduce pollution."

The 10 Point Green Plan for the Port Lands can achieve a minimum of 350 Megawatts in conservation and demand management results, if incentives from the OPA are sufficient to guarantee a three-year payback. Staff are conducting a detailed sector-by-sector analysis of the plan, and will report to the Roundtable on the Environment on May 29, 2006, and to the Policy and Finance Committee on June 20, 2006.

Participation rates and realizable technical penetration in the various sectors covered by the 10 Point Green Plan for the Port Lands will depend heavily on the attractiveness of any OPA incentives. Currently, the City is participating in the THESL CDM Plan. Virtually all participating projects in this CDM Plan are guaranteed a payment of $160 per kilowatt. However, consultations with key stakeholders have led City staff to conclude that a significantly higher level of guaranteed payments per kilowatt would be required from the OPA in order for the 10 Point Green Plan for the Port Lands to accomplish CDM results in the range of 350 Megawatts over the specified timeframe.

Conclusions:

This report addresses the consumption of electricity and natural gas by the city as a whole as well as the consumption within City Divisions, Agencies, Boards and Commissions. Any additional data received from the various key stakeholders, such as the Ontario Power Authority, Enbridge Gas Distribution, Toronto Hydro Corporation, Toronto Hydro Energy Services Incorporated and Enwave Energy Corporation, will be reported to the Policy and Finance Committee meeting on June 20, 2006. All other matters pertaining to the Energy Plan for Toronto, including a supporting report from IndEco Strategic Consulting, will also be submitted at that time for consideration.

Finally, the 10 Point Green Plan for the Port Lands, as submitted to the February 20, 2006 Roundtable on the Environment, could make a significant contribution to the City's overall Energy Plan, dependent on the availability of sufficient funding from the OPA. Discussions are currently underway with the OPA, the outcome of which will be reported to the Policy and Finance Committee meeting on June 20, 2006.

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List of Attachments:

Appendix A	2005 Electricity Consumption within Toronto
Appendix B	2005 Electricity Consumption within Toronto
Appendix C	2005 Electricity Consumption by City Divisions, Agencies, Boards and Commissions
Appendix D	2005 Electricity Consumption by City Divisions
Appendix E	2005 Electricity Consumption by City Agencies, Boards and Commissions
Appendix F	2005 Electricity Consumption for Toronto
Appendix G	2004 Natural Gas Consumption within Toronto
Appendix H	2004 Natural Gas Consumption within Toronto
Appendix I	2004 Natural Gas Consumption by City Divisions, Agencies, Boards and Commissions
Appendix J	2004 Natural Gas Consumption by City Divisions
Appendix K	2004 Natural Gas Consumption by City Agencies, Boards and Commissions
Appendix L	2004 Natural Gas Consumption for Toronto
Appendix M	2005 Carbon Dioxide Emissions Based on Electricity and Natural Gas Consumption
Appendix N	2005 Percentage of Total Carbon Dioxide Emissions Based on Electricity and Natural Gas Consumption
Appendix O	Toronto 10 Point Green Plan for the Port Lands – Potential Impact on Summer Demand (2006 – 2012)