



TORONTO STAFF REPORT

June 8, 2006

To: Policy and Finance Committee

From: Shirley Hoy, City Manager

Subject: Power Generating Facility - Port Lands Ward 30, Toronto-Danforth

Purpose:

To respond to Motion J(30), adopted by City Council at its meeting on April 25, 26 and 27, 2006 on steps that the City can take to ensure that any power generation facility in the Port Lands addresses the issues discussed in the body of this report.

Financial Implications and Impact Statement:

There are no financial implications resulting from this report.

Recommendations:

It is recommended that this report be received for information.

Background:

In 2004 the Ontario Ministry of Energy released a Request for Proposals for 2500 Megawatts of electricity capacity from Clean Energy Sources, Demand Management and Demand Response. Downtown Toronto was specifically identified as a priority zone with critical supply, reliability and voltage support needs.

The Independent Electricity System Operator (IESO), in its 18-Month Outlook report of December 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.

The Port Lands Green Energy Plan was released by an expert panel in January 2006. While accepting that Toronto does need some new generation, the panel provided a 10 point plan to reduce energy demand through conservation, and to ensure more efficient use and delivery of energy, including renewable energy. The program is consistent with the recommendations of the City's Environmental Plan and other City energy initiatives.

In its February 2006 Electricity Reliability Report the IESO emphasized the necessity for a decision in early 2006 to address the need for new supply for downtown Toronto. The IESO has informed the Ministry of Energy that despite increased demand response and conservation efforts in the Toronto area, at least 250 megawatts of new supply is required in the downtown Toronto sector by the summer of 2008, and at least a further 250 megawatts by 2010.

On February 10, 2006, Donna Cansfield, then Minister of Energy announced the direction of the Ontario Power Authority (OPA) to move forward with the development of the Portlands Energy Centre (PEC) for 550 megawatts of gas-fired power generation, to be supplied in two phases (a 330 megawatts simple cycle plant no later than the summer of 2008 and phase two to have a further 220 megawatts combined cycle operation in 2009 along with co-generation capabilities to supply thermal energy to district heating facilities) and to procure 300 megawatts of conservation and demand response in Toronto combined with 250 megawatts of conservation programs by Toronto Hydro.

At its meeting of April 25 to 27, 2006 City Council adopted the motion as attached in the appendix to this report. The City Manager with key staff were requested to consult with TEDCO, the Chief Planner, the TWRC and any other division or agency that may be able to provide assistance and report for no later than June 2006, through the Policy and Finance Committee, on all steps that the City can take to ensure that any power generation facility in the Port Lands takes a conservation first approach, is co-generation ready, is located in the Hearn, minimizes impact on local air quality, and contributes to the revitalization of the Toronto waterfront. This report has been prepared in consultation with the City Solicitor.

Comments:

Energy Planning with a Conservation First Approach

The City of Toronto is preparing an Energy Plan that will develop short, medium and long term options to meet the City's future energy needs. A status report on the development of the Energy Plan will also be considered at the Policy and Finance Committee meeting of June 20, 2006. One of the proposed tenets of the Energy Plan is a Conservation First Strategy that uses conservation and demand management as the preferred action to meet energy needs. Conservation and demand management options to be investigated include a broad range of programs to achieve the more efficient use of electricity by reducing or shifting the overall demand for electricity supply. By using the Conservation First strategy the City of Toronto will minimize the need for additional electricity generation.

Co-generation Perspective

The 2500 Megawatt Request for Proposals for New Clean Generation and Demand - Side Projects, released by the Ministry of Energy in 2004, included co-generation in its description of new generation facilities. Co-generation has been a significant focus of the energy supply debate in terms of meeting Toronto's current and future energy needs.

The Guide to Co-generation (European Association for the Promotion of Co-generation, 2001) defines co-generation as the simultaneous generation of heat and power, both of which are used. It encompasses a range of technologies, but will always include an electricity generator and a heat recovery system. Co-generation is also known as “Combined Heat and Power” and “total energy”.

The Association Guide indicates that conventional power generation, on average, is 35% efficient – up to 65% of the energy potential is released as waste heat. Combined cycle can improve efficiency to approximately 55%, excluding losses for transmission and distribution of electricity. Co-generation reduces this loss by using the heat for industry, commerce and home heating/cooling. Since transporting electricity over long distances is easier and cheaper than transporting heat, co-generation facilities are usually sited close to the heat customer and sized to meet the heat demand.

Co-generation, coupled with district heating and deep lake water cooling, was identified and proposed in environmental studies conducted as part of the Toronto Waterfront Revitalization. Combined with high levels of energy efficiency for buildings that would be connected to the system, this type of integrated energy approach is capable of significant reductions in greenhouse gas emissions and other air pollutants associated with electricity generation. Co-generation and district heating systems are widely used in European jurisdictions.

How the Central Waterfront Secondary Plan addresses Energy and Conservation Issues

The Central Waterfront Secondary Plan (adopted by Council on April 16, 2003) defines as one of its four principles the promotion of a Clean and Green Environment.

In the Port Lands, the Plan policies specifically support the development of “green” industries and medium scale development with opportunities to live and work within the community. New development would be required to meet a set of environmental performance standards including high energy efficiency, reduction of CO₂ emissions, water conservation, clean air and waste reduction requirements. It was recommended that the Environmental Assessment process would provide an opportunity to integrate Toronto’s environmental and sustainability goals into project design and implementation.

Policy P26 of the Secondary Plan requires “the Central Waterfront to be a model of leading edge environmental technologies. Alternative sources of generating electricity, including co-generation, anaerobic digestion, wind turbines and solar power, will be pursued as well as district heating and cooling”. It was also noted in the Plan that the Hearn Plant would become an asset to the Port Lands with many potential reuse options.

How the TWRC’s Sustainability Framework Addresses Energy and Conservation Issues

The TWRC, whose task is the implementation of the Central Waterfront Plan, is committed to making the city's waterfront both a national and global model for sustainability. The TWRC is committed to set new standards for best practices not only in Canada but throughout the world.

In 2004/05 the TWRC released the final version of the Sustainability Framework, after extensive consultation. The goal of the framework is clear: to ensure that sustainability principles are integrated into all facets of waterfront revitalization management, operations and decision-making. It supports and promotes many of the public policies set out in the Government of Canada's departmental Sustainable Development Strategies 2004-2006, the Government of Ontario's Smart Growth strategies and the City of Toronto's Waterfront Scan and Environmental Improvement Strategy.

Focused around five broad goals, the Sustainability Framework identifies concrete short, medium and long-term actions that will lead to remediated brownfields, reduced energy consumption, the construction of green buildings, improved air and water quality, expanded public transit and diverse, vibrant downtown communities.

City staff, working closely with TWRC staff, has been trying to ensure that new development within the Waterfront will meet the policies and intent of the Sustainability Framework. To this end it is intended that district heating and cooling infrastructure would be provided to new development parcels and builders would be required to build new buildings with a higher level of environmental performance than required by the current Building Code. It is expected that this would be achieved through agreements of purchase or lease for public lands released to developers and through conditions imposed through rezoning. As well, the long-term tri-government funding plan for the TWRC to be considered by Council later in 2006 includes \$30 million for the implementation of district energy infrastructure to serve the West Don Lands and potentially East Bayfront. These measures would help to ensure that the infrastructure would be in place and that buildings in the precincts be connected. This would also provide a client base for any co-generation facilities built in conjunction with the district energy system. Similar measures could be implemented in the Port Lands at the time of its development.

Portlands Energy Centre Site Plan Application

PEC applied for Site Plan Approval under Section 41 of the Planning Act, which provides the City with a very limited set of tools to meet the goals of the City with respect to achieving the policies of the Secondary Plan. At Council's direction, City staff in the negotiations with PEC did manage to achieve some benefits consistent with the policies of the Central Waterfront Secondary Plan through settlement of the PEC appeal at the Ontario Municipal Board. These benefits will assist the enhancement of cycling and pedestrian routes as well as the creation of a water's edge promenade to and along the south side of the Ship Channel. In addition, PEC agreed to allow a third party to attach solar panels to the PEC plant (subject to specific conditions).

PEC staff continues to advise that the plant will provide opportunity for connections from the plant for future energy sales of hot water for a hot water based district heating system that could be used to heat up to 3.2 million sq. ft. of living space. The current problem with undertaking this is that at the moment the plant will only provide peaking electricity to bridge the need at times of high demand. Furthermore there is no agreement with any client for the steam or hot water with the result that the required heat exchangers and interconnecting piping are not being installed as they would need to be designed to match the specific needs of the customer.

However, as the plant is a combined cycle facility it can accommodate co-generation without having to modify the mechanics of the plant and could be considered to be as co-generation ready as is prudent from a business perspective at this point.

PEC has also stated that it is also committed to making a one time payment for local air quality improvement activities, to working with the TRCA to address ecological activities regarding concerns related to migratory species, and will provide enhanced noise mitigation measures to achieve ambient noise levels that are compatible with nearby (current and future) residential development.

With respect to air quality, increased energy conservation or clean generation in Toronto will assist the Province of Ontario in achieving its coal phase-out goal. According to the PEC consultants, at the place of highest concentration (the Ship Channel), the average annual contribution from PEC would be approximately 5% of current background levels of nitrogen oxides. PEC will install continuous emissions monitoring systems for nitrogen oxides and carbon monoxide and provide annual emission results to the Toronto Medical Officer of Health.

At the request of the Toronto Medical Officer of Health, the PEC will chlorinate its cooling water to kill e-coli and will develop an operational protocol for the facility's chlorination/dechlorination system. This is intended to ensure reduction of e-coli in effluent to levels that will help prevent increased closures at Cherry Beach, although PEC operations will not be the source of e-coli. In addition PEC has indicated an ongoing community involvement and willingness to respond to public inquiries. PEC will undertake further public consultation as follows:

- 2 public meetings prior to operation;
- annual public meetings for five years of operation; and
- create (within 3 months of commencing construction) and support a volunteer community liaison committee.

In order for co-generation to work it is essential for there to be a market for the heat generated as part of the overall electrical generation process. The most likely market for this district heat would be the Port Lands community. In accordance with the current planning work being undertaken by the TWRC, residential development within the Port Lands is not expected to be ready for occupancy any earlier than between 2010 and 2012 and this schedule could be even later. This schedule could also accommodate the need for such facilities in the event that the Port Lands area is chosen for the 2015 Expo site. Residential development in both the West Don Lands and the East Bayfront will occur before development within the Port Lands.

The TWRC's Sustainability Framework calls for district heating and cooling facilities to be constructed and ready for use to support the first areas of residential development. The provision of a district heating power source in a timely fashion to coordinate with this schedule would be instrumental to ensuring the sustainable nature of this development. While the PEC design will be able to accommodate district heating with the installation of additional equipment, this would mean that at least a basic amount of heating supply is available at all times and that a contract is able to be achieved with an energy provider such as Enwave. In the current operational plan the

PEC facility is intended to be a peaking facility which would not be conducive to the production of district heating.

TEDCO Real Estate and Economic Development Interests

TEDCO is the owner of most of the land and dockwall surrounding the PEC site in the Port Lands. OPG on behalf of PEC has requested a number of easements and consents from TEDCO in order to gain access for the project's construction and for a new natural gas line. Renewed negotiations have been underway between OPG and TEDCO since the Ontario Ministry of Energy's direction to the Ontario Power Authority in February 2006. TEDCO was also requested by City Council in 2005 to review the co-generation potential of PEC and report back to Council. Moreover, TEDCO was requested to use its good offices to attempt to bring PEC and Enwave together so that a co-generation or district heating & cooling arrangement can be made for any new plant in the Port Lands. As a result, TEDCO management has retained expert technical and legal advice and has scheduled business and technical meetings with both parties during the month of June. TEDCO's review and report will provide comment on the prospects for a business agreement for a market-based hot water or steam co-generation facility by Enwave with PEC. TEDCO will also review the co-generation proposal of the Portlands Clean Energy Project (Constellation Energy/Toronto Hydro) and provide comment in its report.

Conclusions:

In 2004 the Ministry of Energy released a Request for Proposals for 2500 Megawatts of electricity capacity from Clean Energy Sources, Demand Management and Demand Response. Downtown Toronto was specifically identified as a priority zone with critical supply, reliability and voltage support needs.

The IESO has 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. More recently the IESO has emphasized the necessity for a decision in early 2006 to address the need for new supply for downtown Toronto. Despite increased demand response and conservation efforts in the Toronto area, the IESO has recommended at least 250 megawatts of new supply in the downtown Toronto sector by the summer of 2008, and at least a further 250 megawatts by 2010.

The expert panel that prepared the Port Lands Green Energy Plan acknowledged the need in Toronto for some new generation, and proposed a plan based on reducing energy demand and improving the use and delivery of energy.

Much of the discussion to date on energy generation within the City has included the potential to employ co-generation technology as a means of ensuring reliable, local energy supply and as a means of reducing the air emissions associated with electricity generation. Co-generation, combined with highly energy efficient buildings, and district heating and cooling, has been studied in the environmental work undertaken as part of the Waterfront Revitalization, and the TWRC business plan calls for the infrastructure to be in place to support residential development.

In addition, City Council has initiated the preparation of a comprehensive Energy Plan for Toronto to address the future energy needs of the City. A status report on the development of the Energy Plan will be provided to Policy and Finance Committee on June 20, 2006 and will include a Conservation First approach that relies on conservation and demand management as the preferred action to meet energy needs.

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Shirley Hoy
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Attachment: Motion J(30), City Council as its meeting on April 25, 26 and 27, 2006

Attachment

Motion J(30), City Council as its meeting on April 25, 26 and 27, 2006:

“WHEREAS the Provincial Minister of Energy on February 10, 2006, directed the Ontario Power Authority to negotiate an agreement to purchase power from the Portlands Energy Centre (PEC); and

WHEREAS the City acknowledges and supports the need for new generation to Ensure Reliability of Electricity Supply to Central Toronto as outlined by the IESO, Hydro One, Toronto Hydro Corporation and the Ontario Power Authority on January 11, 2006; and

WHEREAS PEC, which is owned by TransCanada Energy Ltd. And Ontario Power Generation Inc., wishes to construct a new 550 megawatt, gas-powered electricity generating plant next to the existing R.L. Hearn Generating Station; and

WHEREAS Toronto City Council has expressed its opposition to the Portlands Energy Centre going forward without co-generation; and

WHEREAS the Toronto Waterfront Revitalization Corporation (TWRC), a partnership corporation among the Federal, Provincial and City of Toronto governments, has stated that new power generation on the Port Lands should:

- (1) be located in the Hearn Plant;
- (2) include co-generation; and
- (3) incorporate demand management into Toronto’s energy planning;

and that these elements which are not part of the current PEC proposal should be integrated into the provincial plans; and

WHEREAS the TWRC’s position is consistent with the City of Toronto’s position; and

WHEREAS the Ministry of the Environment Certificate of Approval requires the PEC to have a Combined Cycle Component efficiency of 53 percent annually; and

WHEREAS the Ministry of the Environment Certificate of Approval may have to be amended, as the PEC may not be able to meet this requirement and open as required in 2008; and

WHEREAS the PEC may need access to or through property under the authority of the City of Toronto, Toronto Economic Development Corporation (TEDCO) or TWRC; and

WHEREAS the City of Toronto has stated that any new power must be a co-generation ready facility, with capacity to provide District Heating for the revitalized waterfront, preferably from the existing Hearn facility; and

WHEREAS Toronto Hydro Energy Services, in partnership with Constellation Energy (also known as the Clean Energy Plan) has submitted a proposal to the Ontario Power Authority to utilize the existing Hearn facility in which it would build a smaller – 291 megawatt, high-efficiency generation plant, less expensive, co-generation ready facility; and

WHEREAS the Clean Energy Plan uses the most modern equipment, which will fit inside the existing Hearn facility and eliminate the need for a new industrial plant to be built in the Port Lands, is more environmentally-friendly, uses the best available pollution controls, provides space in the existing Hearn plant for both future District Heating and Cooling Plants and will contribute \$30 million in funding to a not-for-profit community trust; and

WHEREAS the Clean Energy Plan commits to implementing 200 megawatts of power, without building additional generation through Conservation Demand Management (CDM); and

WHEREAS the Clean Energy Plan is a cleaner, greener, smaller plant that will keep the lights on in Toronto, and

WHEREAS the Ontario Minister of Energy has refused to allow the Ontario Power Authority to review and compare both proposals and make recommendations to the Minister; and

WHEREAS the Portlands Energy Centre has just announced its intention to start preliminary site work in preparation for constructing their new Power Generating Facility right next to the existing R.L. Hearn Facility;

NOW THEREFORE BE IT RESOLVED THAT the City Manager and the City Solicitor consult with TEDCO, the Chief Planner, the TWRC and any other division or agency that may be able to provide assistance and report for no later than June 2006, through the Policy and Finance Committee, on all steps that the City can take to ensure that any power generation facility in the Port Lands takes a ‘conservation first’ approach, is co-generation ready, is located in the Hearn, minimizes impact on local air quality, and contributes to the revitalization of the Toronto waterfront.”