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PILOT PROJECT - ELECTRICITY DEMAND MANAGEMENT UTILIZING EXISTING EMERGENCY GENERATORS

(Regional Council at its meeting on March 29, 2007 amended the following Clause to add Recommendation No. 5 as follows:

5. *That it be clear that this is a pilot project and that the Commissioner of Corporate Services report to the Finance and Administration Committee by October 4, 2007 on the results of this pilot project.)*

The Finance and Administration Committee recommends the adoption of the recommendations contained in the following report, January 30, 2007, from the Commissioner of Corporate Services and the Commissioner of Transportation and Works:

1. RECOMMENDATIONS

It is recommended that:

1. Council approve in principle the use of existing emergency generators at the Aurora Pumping Station to assist managing electricity peak demand, subject to amendments to the *Electricity Act* permitting the Region to generate, transmit, distribute and sell electricity in certain circumstances without the need to establish a separate corporation for this purpose.
2. Council approve the proposal submitted by PowerStream, a local distribution company, to use existing emergency generators at the Aurora Sewage Pumping Station, during peak electricity demand periods.
3. Staff be authorized to prepare a contract agreement aligned with the proposal outlined in recommendation 2.
4. The Regional Chair and Clerk be authorized to sign the above noted contract agreement upon approval of the Regional Solicitor.

2. PURPOSE

The purpose of this report is to provide a solution to relieve the stress on the Armitage Transformer Station by using existing emergency generators during peak electricity demand periods. The Armitage Transformer Station is part of the network supplying

electricity to the north east portion of York Region (*see Attachment 1*). PowerStream has submitted a proposal to use existing emergency generators to better manage peak electricity demand. Council approval and implementation of the proposed project will exhibit the Region's stewardship role in promoting conservation and demand response management.

3. BACKGROUND

York Region is one of the fastest growing areas in Ontario. This rapid growth in the residential and commercial sectors continues to significantly increase the demand for electricity in the Region. According to the Ontario Power Authority (OPA) report on York Region, the electricity supply infrastructure in the north east portion of the Region has exceeded its planned capacity. The communities served by the Armitage Transformer Station are identified as being the most urgent areas of need. Attachment 1 shows the areas served by the Armitage Transformer Station and peak demand (actual and forecast). The Armitage Transformer Station peak demand has already exceeded the existing transformation capacity. The gap between existing transformation capacity and peak demand is projected to increase in the future, which may result in rolling black-outs or brown-outs in the Region.

Current regulation and codes in Ontario stipulate that most institutional, commercial and industrial buildings require a form of emergency electricity generation for critical life safety systems. The most common form of emergency power is the diesel generator set, which upon a power failure supplies the critical load for the duration of the outage. These emergency generator sets for the most part remain idle. The Aurora Sewage Pumping Station has three existing emergency generators capable of generating 3.9 MW electricity per hour (MW/h). These generators provide an opportunity to supply much needed peaking power to the Region.

4. ANALYSIS AND OPTIONS

PowerStream's Conservation and Demand Management program will fully fund the cost of providing and installing the necessary upgrades to ready the emergency generators for peak demand management. The estimated capital cost to be invested through Conservation and Demand Management funding is \$524,000. The incremental cost of operation will be funded from revenues received due to electricity generation. In return the Region agrees to make the generation assets available to PowerStream for a maximum of 250 hours per year for a minimum three year period. Further renewal of the contract will be subject to a mutual agreement. Pursuant to the Region's approval, the objective is to have this work completed prior to the peak 2007 summer season.

4.1 Benefits

York Region will benefit from this program as follows:

4.1.1 Reduced air emissions

The Ministry of Environment's (MOE) air emissions threshold for a peak demand management generator is 3.5 times less than an emergency generator. The existing emergency generators will be modified by adding a selective catalytic reduction complete with a proprietary catalyst bank on the exhaust of the emergency generator to meet the change of status. PowerStream has clarified that the annual emissions from a peak demand management generator equipped with a selective catalytic reduction and operating for 250 hours will be less than an emergency generator without a selective catalytic reduction and operating for 30 hours of testing.

4.1.2 Increased generator life and reliability

Maintenance related operation of these emergency generators is currently limited to approximately 30 hours per year under existing approval. Major reliability problems arise from inadequate test time and partial load used for testing. When a diesel engine operates at partial load it will not operate at its optimum condition. A full testing load can extend the life expectancy of the engine.

Present operational constraints at the Aurora Sewage Pumping Station do not permit testing of the generators at full load.

Enrolling under this program will enable generators to operate at full load resulting in increased generator life and reliability. PowerStream will undertake the regular inspection of the generators. This will eliminate the third party generator inspection cost that York Region pays for this facility.

4.1.3 Increased asset value

PowerStream's proposal involves the addition of paralleling electrical switch gear and post combustion emission control technology to York Region's asset. Upon expiry of the three year contract, this equipment will become the Region's asset.

4.1.4 Increased sound attenuation

With installation of additional sound attenuators, the noise level will be reduced from the present level. This will ensure quieter generator operation than existing conditions.

4.1.5 Utility cost savings

Once generators start up, electricity generated will displace the Aurora Sewage Pumping Station consumption from the grid. The excess electricity generated will be exported to the grid. This load displacement will result in lower electricity bills for the facility. Actual savings will be calculated once the first year's data has been analyzed.

4.1.6 Revenue generation

Upon York Region's approval, PowerStream will register the Aurora Sewage Pumping Station generators in the Emergency Load Reduction Program. Participants will receive standby and generation payment. This will result in additional revenue.

Independent Electric System Operator introduced Electricity Load Reduction program to address this peak electricity demand. Participants receive an hourly "standby" payment for each standby Megawatt (MW) reduction in the amount of \$15 per MWh. Upon actual generation, participants receive payments based on the greater of Hourly Ontario Energy Price and:

- \$400/MWh for 2 hours of consecutive reduction,
- \$500/MWh for 3 hours of consecutive reduction, or
- \$600/MWh for 4 hours of consecutive reduction.

To cover the incremental cost of operating the generators as a result of participating in this demand response program, proposal provides an additional unit rate of \$200/MWh to be paid to the Region from the gross revenues received. PowerStream will share the net revenue equally with the Region (50-50).

Attachment 3 illustrates the potential revenue that could be realized by the Region from participating in this Program.

This calculation shows net revenue of \$31,785 for York Region however this is subject to extreme weather condition, generator failure, number of hour's generators run, and Hourly Ontario energy Price (HOEP)

4.2 Legislation and regulatory impact

4.2.1 Changes to Electricity Act

Section 144 of the *Electricity Act* currently states that municipalities are required to form a separate Ontario Business Corporation Act company if they wish to generate electricity other than during an emergency. A request for an amendment to the Electricity Act has been submitted to the Ministry of Energy, if acted on will permit municipalities to operate as generators without the need to establish a separate Ontario Business Corporation Act company. The Ministry of Energy is considering an amendment that would exempt York Region from this requirement. This amendment is anticipated to become effective by the end of March 2007.

4.2.2 Amendment to the existing Certificate of Approval

The existing Certificate of Approval as issued by MOE for operation of the emergency generators needs to be amended to reflect the change from strictly emergency use to peak demand management use. To meet the requirements of the proposed Certificate of Approval amendment, the existing emergency generators will be modified by adding a selective catalytic reduction based emission control system, complete with proprietary catalyst bank on the exhaust of the emergency generator. PowerStream implemented a

similar project to study the emissions from an emergency generator equipped with selective catalytic reduction. The results indicate reduction of the emission will meet the required threshold set by MOE for non-emergency generators. Once installation and measurement of emissions are complete, amendment to the existing Certificate of Approval will be applied to MOE. The responsibility of requesting and obtaining the revised Certificate of Approval lies with PowerStream.

4.3 Operation and maintenance responsibility

Maintenance of the existing generators will continue to be York Region's responsibility. Operation of the new equipment including replacing the consumables (such as air filter, selective catalytic reduction fuel) will nominally increase the cost of operation. The increased operational hours may increase nominally the staff's responsibility.

There are no penalties if the generators are not available for any reasons such as unavailability of the Region's staff or equipment; however, there will be no revenue if the generators are not available for operation when required.

4.4 Relationship to Vision 2026

This Program is in line with Goal 2 "Enhanced Environment, Heritage and Culture" and supports Goal 4 "responding to the needs of our residents" of Vision 2026. Implementing this program will support following criteria:

- Ensuring clean water and air
- Promoting conservation
- Using energy more efficiently in operations of the Regional government

5. FINANCIAL IMPLICATIONS

As there is no capital investment required from the Region, this proposal will have no impact on the budget. Although staff responsibilities will increase due to the implementation of this program, no additional staff complement is anticipated. An incremental cost associated with operating the generators for the purpose of peak demand management will be deducted from the revenue received from electricity generation.

5.1 Capital investment

York Region will not be required to invest any capital to participate in this initiative. All of the \$524,000 estimated capital investment will be funded by PowerStream's Conservation and Demand Management fund. PowerStream has included a contingency fund for the unforeseen circumstances that may arise from implementing this project. As a result, participating in this initiative has no impact on the Region's budget.

5.2 Revenue Expectations

PowerStream is seeking the right to use of the generators for the maximum 250 hours per year for minimum of three years. Depending on the number of hours that the generators are utilized for peak management purposes, revenue will be generated. The Region may realize no revenue should there be no need to run the generators for peak demand management. On the other hand the maximum revenue possible is \$198,656 based on 250 hours of generator run. PowerStream will share the net revenue equally with the Region (50-50).

According to Ontario Power Authority (OPA), there were 18 days in the summer of 2005 that peak demands exceeded the capacity of the Armitage Transformer Station, in total 72 hours for the entire season. A sample calculation (*see Attachment 3*) indicates a net revenue of \$31,785 should there be 40 hours of generators utilization for peak demand management.

5.3 Utility cost saving

Electricity generated through this program will replace electricity consumption of the Aurora Sewage Pumping Station. Lower Electricity usage from the grid will result in lower utility bills. This benefit will be in addition to the York Region's net revenue.

6. LOCAL MUNICIPAL IMPACT

The closest residential property to Aurora Sewage Pumping Station is located 151 meters to the north west of Aurora Sewage Pumping Station across from the Railroads. (*see Attachment 2*). Upon project implementation, the sound level will be significantly reduced from the present level. Due to the distance, we do not foresee objections from this residence as a result of implementing this project; however a consultation will be carried out under this proposal.

7. CONCLUSION

This initiative is a partnership between York Region and PowerStream. It assists in mitigating the risk of brown-outs and rolling black-outs in York Region and specifically helps in relieving stress on the Armitage Transformer Station.

It improves reliability of the existing generator sets and reduces air emissions during generator operation, while increasing asset value.

York Region will not be required to invest any capital to participate in this initiative and may well generate additional revenues.

Most importantly, this proposal exhibits the Region's leadership in addressing the critical electricity supply issue in north east York Region.

The Senior Management Group has reviewed this report.

(The attachments referred to in this clause were included in the agenda for the March 8, 2007 Committee meeting.)