COMMITTEE OF THE WHOLE – SEPTEMBER 19, 2005

ONTARIO POWER AUTHORITY
YORK REGION ELECTRICITY SUPPLY STUDY
DRAFT RECOMMENDATIONS TO THE ONTARIO ENERGY BOARD

Recommendation

The City Manager Recommends that:

> The Ontario Power Authority BE ADVISED that the City of Vaughan has no objection to the draft recommendations emerging from the York Region Electricity Supply Study, as presented by the Ontario Power Authority on September 9, 2005;

Economic Impact

There are no anticipated economic impacts as a result of this report.

Purpose

The purpose of this report is to advise Council of the measures being recommended by the draft York Region Electricity Supply Study, as prepared by the Ontario Power Authority, to address potential shortfalls in electricity supply in northern York Region. This report will also give the City of Vaughan the opportunity to provide its comments on the draft recommendations. Comments have been requested by September 23, prior to the Ontario Power Authority's submission of the study to the Ontario Energy Board on September 30, 2005.

Background - Analysis and Options

a) Background to the York Region Electricity Supply Study

The York Region Electricity Supply Study was initiated to ensure that the Newmarket, Aurora, King, Whitchurch-Stouffville and East and West Gwillimbury area would continue to have a secure supply of electricity in the short to medium term. Increasing demand, resulting from urban growth, is threatening the security of the power supply to these municipalities. Without system improvements, there is a risk of service interruptions.

Originally, Hydro One undertook a Class Environmental Assessment study to address this problem. It recommended upgrades to the existing transmission corridor that connects Markham to Newmarket to increase its capacity and to add a transformer station. Hydro One's plan, was opposed by the affected municipalities, residents and the school boards due to the potential health impacts resulting from the electro-magnetic field effects, aesthetics and economic impacts. Because of the opposition, Hydro One abandoned this process early in 2005.

The Ontario Power Authority (OPA) was formed in December 2004, and the resolution of the York Region electricity supply situation was delegated to the OPA. The Ontario Power Authority is a non-profit statutory corporation with an independent board of directors that reports to the Legislature of Ontario through the Ministry of Energy. The corporation is licensed and regulated by the Ontario Energy Board (OEB) with a mandate to address the following four areas of Ontario's electricity sector: Power System Planning; Generation Development; Conservation; and Retail Services.

The OPA is conducting the study of the York Region electricity supply situation in order to recommend a solution to the Ontario Energy Board. Unlike Hydro One, which is responsible for the transmission of power, the OPA can examine a range of solutions including conservation and new generating capacity, as well improving the transmission grid. To broaden the number of

opportunities under consideration, the OPA issued Requests for Expression of Interest for new generation facilities and for the implementation of demand reduction and conservation measures for northeastern York Region on May 2 of this year.

The OPA's specific mandate for the York Region project is to: reassess the need for electricity in the region; develop and analyze a broad range of options to fulfill the assessed need; conduct a public consultation process to invite public participation in the assessment of a range of options and integrated solutions; and submit the OPA recommendations to the Ontario Energy Board for approval.

The York Region Electricity Supply Study involved three steps. The first step was for the Ontario Power Authority to prepare a plan to address the power situation in northeast York Region. The OPA has conducted technical analysis, undertaken public consultation and negotiated with service providers (e.g. for new sources of generation) to develop the plan.

The second step is to submit this plan to the Ontario Energy Board for approval. The Energy Board will hold hearings on the plan and can approve or modify it. Notwithstanding a decision by the OEB, an Environmental Assessment would still be required for all elements of the plan that are subject to the EA Act.

The third step is to conduct the Environmental Assessment to examine the effects (e.g. environmental, economic, social and health) of the project and any required mitigation measures. Once EA approval has been obtained the project can proceed. It is noted that the OPA in its study will not look at the environmental effects, but will focus on the system and cost issues related to the plan.

b) Public Consultation

The public consultation process included three elements. The first involved interaction with the general public; the second was a working group that dealt with technical issues and potential solutions. The final element was a Municipal Council Review Forum, which was established to obtain comment from elected officials.

Kick-off meetings to brief the public on the study were held on May 4, 2005 (south York Region) and May 26, 2005 (north York Region). The representatives from the Ontario Power Authority provided an overview of the reason for the study, described the role of the OPA in the process and outlined the public consultation process. Due to the immediate threat to the power supply a very short turnaround time for the study was prescribed.

The Working Group was established by the OPA to provide advice on the assessed need, defining options, determining evaluation criteria, applying the criteria and evaluating the options. The Working Group was composed of: a municipal representative from each of the potentially affected York Region municipalities; a resident from each of the municipalities, the school boards and environmental interests; business and development representatives; the York Region Planning Department; and various technical advisors including the local power companies (e.g. PowerStream) Hydro One and the OPA' s consultants.

Roy McQuillin, Manager of Corporate Policy and Karen Antonio-Hadcock, Senior Planner, Environmental, participated as Working Group members for Vaughan. A total of five all-day Working Group meetings took place from June 23, 2005 to July 28, 2005.

The Working Group assessed a variety of options to address the electricity supply/demand issues in northern York Region. The outcome of the Working Group meetings included a set of evaluation criteria that contained social, economic, and environmental factors; feasibility; cost; reliability; risk/uncertainty management; alignment with other regulations; and alignment with longer term planning objectives. A number of options ranging from conservation and demand

management (CDM), transmission (including both overhead and underground), distribution, and generation, were then vetted through these evaluation factors. All viewpoints enunciated by the Working Group will be captured in a summary consultation report, which will be submitted to the Ontario Energy Board. The findings of the Working Group assisted the OPA in formulating its recommendation to the OEB.

Municipal Review Forums for elected officials were also held twice during the process, on July 8, 2005, and August 18, 2005. The Municipal Review Forum was instrumental in obtaining an opportunity for the public and municipalities to provide comments to the OPA in advance of its submission of its recommendations to the Energy Board.

On September 9, 2005 the Ontario Power Authority presented its draft recommendations to the Working Group, the elected officials and the media. On September 14, 2005 a briefing for the public was held in Newmarket. Comments on the draft recommendations have been requested by Friday, September 23, 2005, to allow the OPA to make any possible adjustments to the study, in advance of its submission to the Ontario Energy Board on Friday, September 30, 2005.

Analysis

a) The Nature of the Problem

The electrical transmission, transformation and distribution system is currently subject to constraints, which are threatening the reliability of the system in northern York Region. The main issues are summarized as follows:

- The affected area is primarily served by one 230 kV double-circuit line (Claireville to Minden) and one transformer station in Newmarket (Armitage TS) – See Attachment 1;
- Peak demand reached 375 Megawatts this summer;
- Load growth is estimated to be 3.25% per year or about 140 additional Megawatts by 2015;
- Power from the Claireville-Minden Line is distributed to the Armitage Transformer Station by way of the Holland Junction Tap, which is limited to approximately 375 MW. (Note: the availability of 25 MW +/- from Keele Valley is currently the difference in keeping the tap within its capacity limits);
- Transformation capacity at Armitage is currently rated for 317 MW. This has been exceeded this summer;
- There are insufficient local feeders available at Armitage to accommodate planned growth – four more are required;
- Stress on the transmission, transformation and distribution equipment, resulting from operating at and beyond capacity, leaves the system vulnerable to service interruptions (e.g. "bownouts" and "rolling blackouts"), especially if there is a "contingency" or breakdown in the system;
- The need to resolve these issues is immediate; and
- In summary, there is the need to address three system bottlenecks in the areas of transmission, distribution and supply.

The draft recommendations contained in the York Region Electricity Supply Study suggest the following approach.

b) The Recommended Solution

The OPA is proposing to recommend a series of integrated measures to the OEB, which will ensure that the northern part of York Region has a dependable supply of electricity for the next fifteen years. These measures can be phased-in incrementally within the affected service area. This represents a departure from earlier approaches to electricity supply, which concentrated on

upgrading transmission lines and the production of more electricity at remotely located facilities. The plan relies on:

- Demand Reduction and Conservation;
- Upgraded Transformation Capacity; and
- Introduction of an Additional Local Supply: Generation.

Demand Reduction

Demand reduction involves the use of targeted demand response measures and conservation and efficiency improvements. Demand response serves to control the level of electricity use at a given time (e.g. peak time or peak season) by shifting consumption to another period. Demand Response can also include distributed electricity production and the use of standby generators during peak periods.

Conservation measures reduce consumption and can include programs to upgrade to more efficient appliances (e.g. exchange programs), efficiency improvements for social housing and institutional buildings (including municipalities) and support for the implementation of the Energy Star program for new buildings. The Ontario Power Authority proposes to work with the Local Distribution Companies (like PowerStream) to support their continuing conservation measures.

A Request for Proposals will be issued seeking a plan to reduce demand by 20 Megawatts by 2011. However, given the immediacy of the situation, it will be seeking as much reduction as possible by the summer of 2006. It was recognized that demand reduction was not the sole solution to the problem and that other measures would be necessary to ensure a reliable supply.

Transformation

The affected service area obtains the majority of its electricity from the Clairville to Minden double circuit 230 KV transmission line. This line is tapped at Holland Junction, northwest of Newmarket and the power is transmitted by two 230 KV circuits to the Armitage Transformer Station in Newmarket. The capacity of the Holland Junction tap is limited to approximately 375 Megawatts. There is a risk of voltage collapse on this line by 2006 when demand is expected to exceed 375 Megawatts. The Armitage Transformer Station capacity is currently limited to 317 Megawatts and this limit has already been exceeded during peak periods. Further, this station requires four more distribution feeders to meet the growing local demand.

The recommended response involves the construction of a transformer station in the vicinity of Holland Junction. This has several advantages. It is close to the supply area, which will reduce the distribution costs and line-losses and it will remedy the overloading of the tap to the Armitage Transformer Station. To support the existing and proposed transformer station, capacitors (short term electricity storage) will be installed to provide additional power during peak periods. These measures will increase the load meeting capacity of the system by 150 Megawatts. Implementing these measures has short lead-time as the construction of new transmission lines will not be required. It is expected that these measures could be put in place in 2006 and 2007.

In the longer term, it recommends that provision be made for an additional transformer station, preferably in northern Aurora. It would serve Newmarket and Aurora and would be required if and when the Armitage and Holland Junction Transformer Stations reach capacity. It could be implemented by 2011.

Local Supply: Generation

The recommended solution also includes the local generation of electricity. Specifically, it calls for the construction of a natural gas fuelled "simple-cycle" generating plant connected to either the Claireville – Minden transmission line or the tap to the Armitage Transformation Station.

Local generation is preferred over transmission plus additional generation elsewhere. It is a lower cost option, it enhances the security of supply by providing another source of power for the Region and it can relieve overloading at the Claireville Transformer Station.

The flexibility of a "simple-cycle" plant was considered to best suit the needs of York Region. The simple-cycle plant would be run by natural gas fueled gas turbines, which are similar to jet engines. They can be started quickly, which is important as they would be needed to quickly address peak period loads. As such, they would not be intended for continuous service. However, they can be arranged in multiple units to provide longer-term power in the case of a supply disruption elsewhere.

A generation solution would not be expected to come on-line until 2008 at the earliest. Of the measures recommended by the Ontario Power Authority, this is the only one that requires Energy Board approval. However, a Class Environmental Assessment would also be required.

c) Local Implications

No works within the City of Vaughan are proposed as a result of the recommended solution. Upgrading of the transmission corridors within Vaughan was considered but dismissed.

However, there may be some broader implications of the approach being suggested by the OPA. It supports the concept of locally generated power to address the needs of an immediate area, particularly for meeting demand in peak periods. If this is the trend, municipalities may have to deal more frequently with proposals for power plants within their boundaries. Appropriate locations will need to be found to minimize impacts on adjacent land uses. Similarly, the use of private generating facilities (e.g. stand-by and emergency generators operated by businesses ancillary to their primary activity) to address peak power demands may also pose problems for adjacent land uses, depending on their location, type of fuel and noise profile. The impact of such measures is uncertain, but bears watching in the future.

The emphasis on conservation is a positive development. It is expected that conservation measures developed as part of this proposed solution would be applied elsewhere in the Region. Municipalities can be expected to play a leadership role in ensuring that their buildings and facilities are energy efficient and on the leading edge of conservation technology.

Relationship to Vaughan Vision 2007

This report is consistent with the priorities previously set by Council and the necessary resources have been allocated and approved.

Conclusion

The creation of the Ontario Power Authority provided an opportunity to take a more comprehensive approach to system planning, rather than relying solely on the construction of large centralized generation plants and more high voltage transmission lines. While such facilities will continue to be important elements in the system, the approach taken in this study resulted in an examination of other alternatives that may be more environmentally friendly, cost-effective and less contentious.

The recommendations contained in the report have no immediate impact on the City of Vaughan, in that the recommended system improvements will all be undertaken beyond Vaughan's boundaries. However, the lessons learned in implementing the demand management, conservation measures and local generation may ultimately be broadly applied.

An important component of the development of the plan was the consultation process. While somewhat rushed, it was good vehicle to bring together a wide range of people and disciplines to gain an understanding of the problems and the potential solutions. The recommendations of the OPA substantially reflect the conclusions drawn by the Working Group. The OPA should be encouraged to learn from this process and to further refine and enhance how it conducts future public consultations.

On this basis it is recommended that the Ontario Power Authority be advised that the City of Vaughan has no objection to the draft recommendations of the York Region Power Supply Study, as presented by the OPA on September 9, 2005

Attachments

1. Affected Service Area and Bottlenecks
2. The Integrated Solution
3. Implementation Timeline

Report prepared by:

Karen Antonio-Hadcock, Senior Planner, Environmental, ext. 8630
Roy McQuillin, Manager of Corporate Policy, ext. 8211

Respectfully submitted,

MICHAEL DeANGELIS
City Manager

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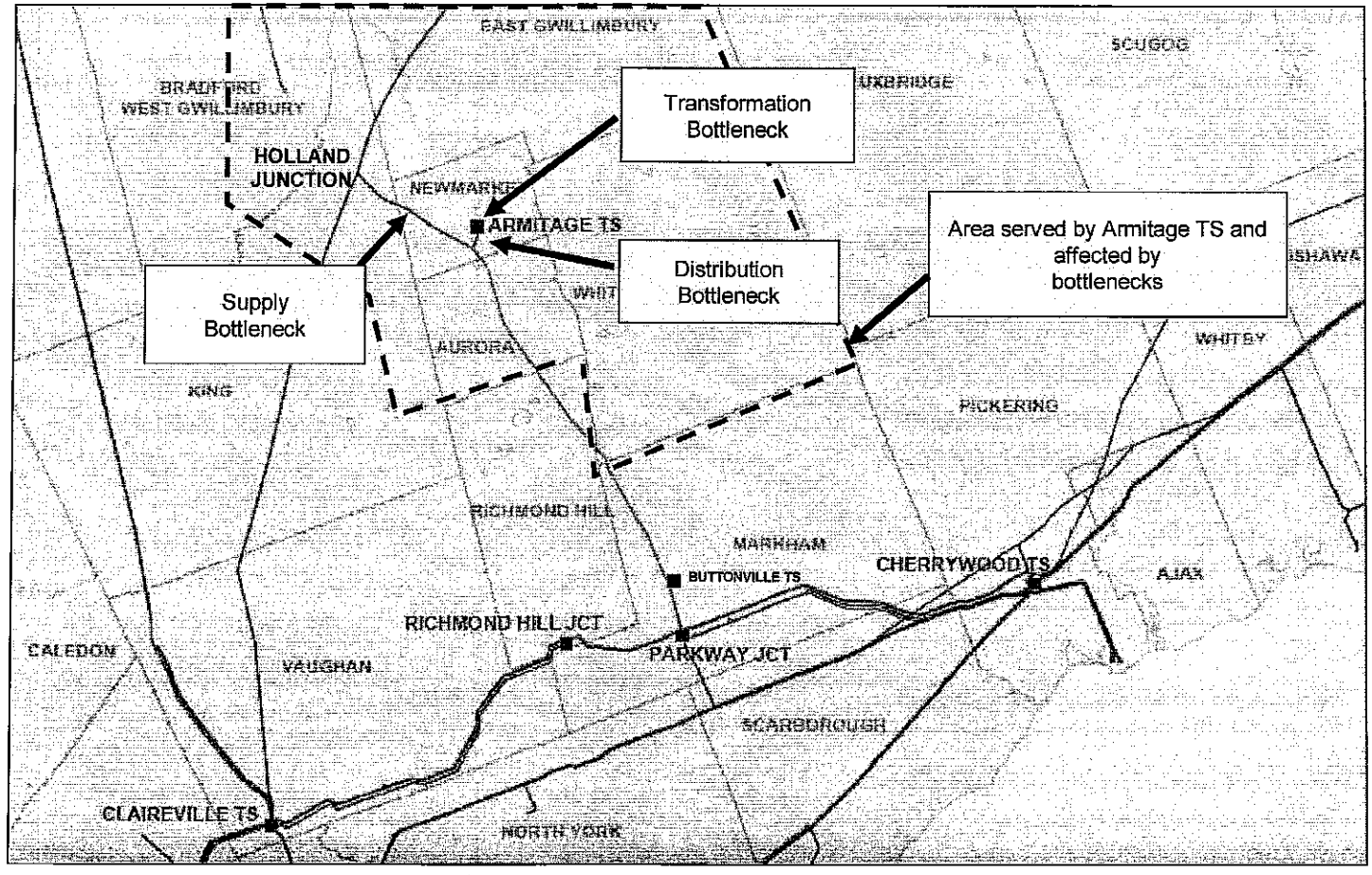
Bottlenecks



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Affected Service Area and Bottlenecks

City of Vaughan
Development Planning Department

Attachment 1

September 15, 2005

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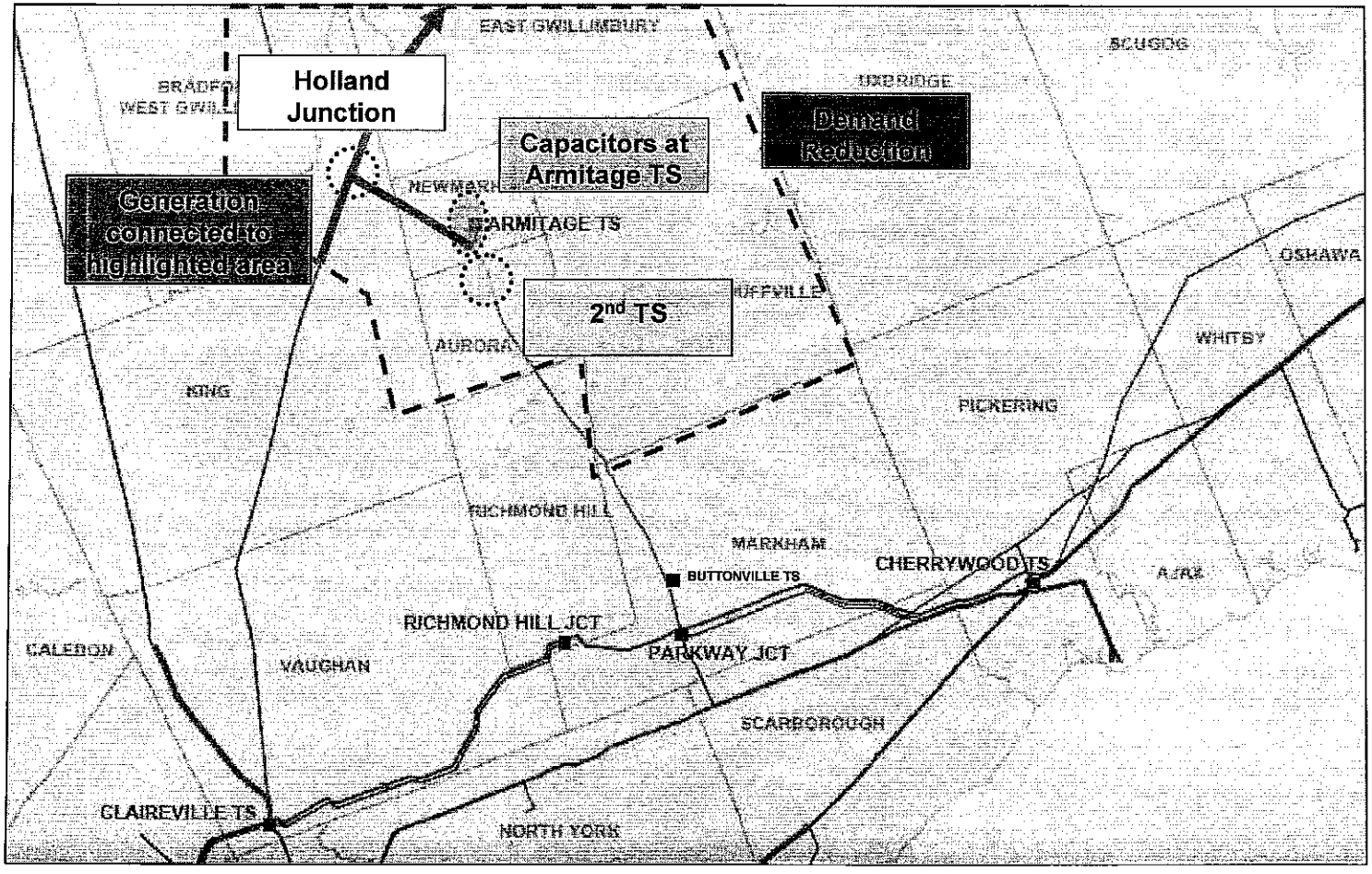
Integrated Solution



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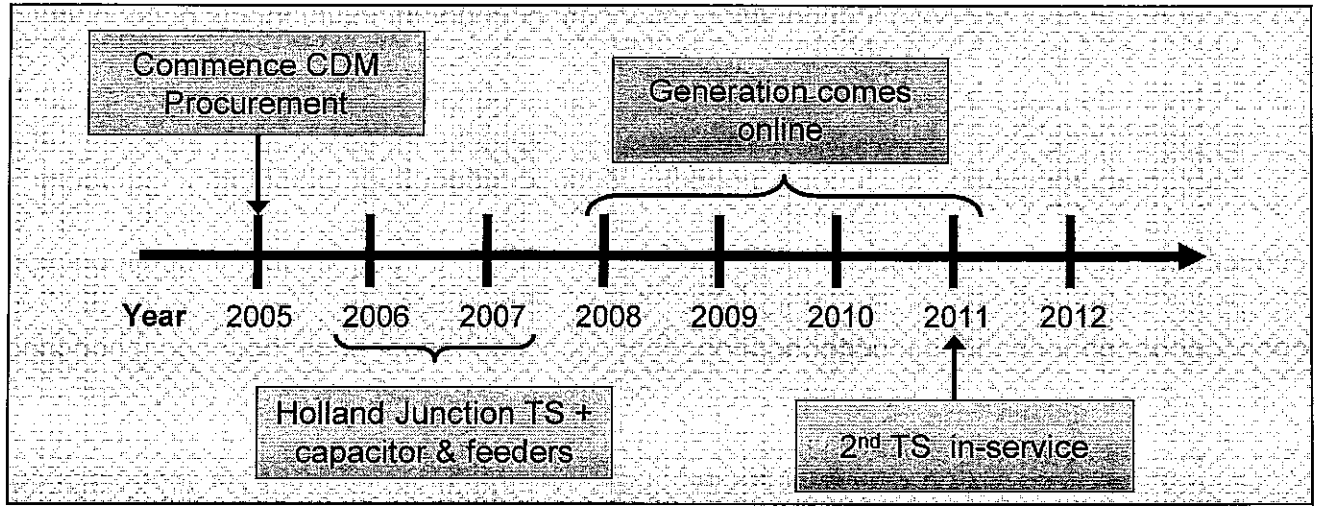
The Integrated Solution

City of Vaughan

Attachment 2

September 15, 2005

Implementation Timeline



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Implementation Timeline

City of Vaughan

Attachment 3

September 15, 2005