18-MONTH OUTLOOK:

An Assessment of the Reliability of the Ontario Electricity System

From October 2005 to March 2007

ieso

Power to Ontario. On Demand.

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Executive Summary

This 18-month Outlook provides the Independent Electricity System Operator's (IESO) assessment of the reliability of the Ontario electricity system from October 2005 to March 2007. The assessment incorporates the most up to date forecast information available as well as integrating experience gained from past operations, especially over the past summer.

The peak Ontario demand of 25,414 megawatts (MW) set in August 2002 was exceeded on seven separate occasions this past summer, resulting in a new Ontario peak demand record of 26,160 MW on July 13, 2005. Sustained high temperatures and humidity levels combined with limitations on supply, both from domestic generation and imports, presented a number of challenges for the IESO in managing the reliability of the electricity system. Coincident with the hot weather, available hydroelectric energy production was lower than forecast in the June 2005 Outlook, frequent temperature-related environmental limitations to generation production were encountered and the extension of a few planned outages to generation aggravated the energy situation. Similarly, with the transmission system operating at its limit to support the demand, numerous temperature related limitations were encountered.

As a result of the strain on the system, the IESO was required to repeatedly activate emergency control actions. These included issuing Public Appeals for customers to reduce their use of electricity on 12 days and implementing sustained five per cent voltage reductions on August 3 and August 4 in order to reduce demand and maintain power supplies to Ontario consumers.

In order to avoid persistent use of emergency control actions for future conditions similar to the summer of 2005, the IESO is pursuing a number of initiatives, targeted to be in place before the summer of 2006. These actions include the acceleration, where possible, of planned infrastructure projects, improving the capability of existing resources and establishing an Emergency Demand Response Program similar to those of neighbouring markets. Of particular importance is increasing the certainty of capacity and energy availability through day-ahead arrangements in the wholesale electricity market. When implemented, these arrangements will provide greater certainty of intertie transactions and internal resources and provide the IESO with improved planning capability with respect to potential energy limitations.

Under normal weather conditions Ontario is expected to be able to meet its capacity and energy needs. However, during periods when the supply and demand situation is tight, such as conditions experienced this past summer, or during extreme weather conditions, Ontario will need good performance from generation within Ontario and will rely on imports from neighbouring markets. The need for continued reliance on imports underscores the urgency to address limitations affecting the ability to import.

Increased supply scheduled to come into service over the 18-month timeframe of this Outlook is expected to slightly exceed forecast load growth over the same period.

Ontario Power Generation's plans to return Pickering A Unit 1 to service in the fourth quarter of 2005 will result in an increase of 515 MW to Ontario's electricity system. In addition, eight of the 10 projects from the provincial government's Request for Proposals for Renewable Generation are expected to be available. This includes approximately 300 MW of wind generation. Changes to nuclear unit capability will provide an additional 100 MW over the forecast period and there is

expected to be an additional 117 MW of gas-fired generation installed from the Clean Energy Supply (CES) RFP.

Hydro One's development of the second phase of the Parkway Transformer Station is scheduled for completion by the beginning of summer 2006 and will partially address the high loading of transmission facilities in the Greater Toronto Area (GTA) in the short term. However, additional transmission reinforcement and local generation capability is urgently required to avert the need to use emergency control actions and the increased risk of load shedding within the GTA.

The need for additional supply in the west GTA has reached a critical point with a minimum of 600 MW of new supply required before summer of 2007. Contingency plans are being prepared by the IESO to manage and contain the consequences of the problem until new generation is available.

Outside of the GTA, the transmission system is expected to be adequate to supply demand under the forecast conditions studied in this Outlook, with some exceptions. In those cases, the limitations experienced over the summer of 2005 must be addressed to minimize use of emergency control actions in the future. Limitations which need to be addressed include increasing the transfer capabilities in the Windsor area, northward into the Hamilton-Burlington area, and westward from St. Lawrence Transformer Station. Transmission in these areas limited the use of available Ontario generation and/or limited imports into the province during hot-weather, high-demand periods.

The government has set aggressive targets for energy conservation to reduce peak electricity consumption by 5 per cent by 2007. However, because the impact of new conservation initiatives is as yet difficult to forecast, the effects of these new conservation efforts are not reflected in the Ontario demand forecast used in this Outlook. These conservation efforts can make a significant difference.

The IESO demand forecast has been updated to reflect actual economic, demand and weather data through to the end of July 2005. Energy demand is expected to be 156.8 terawatt hours (TWh) for 2006, a 0.9 per cent increase over the projected energy demand for 2005 (155.5 TWh). The most significant change to the forecast is increased demand for the summer of 2006. The normal weather peak demand for the winter of 2006 is forecast to be 24,272 MW and the summer peak of 2006 is forecast to be 24,234 MW.

It is worth noting that the Ontario demand exceeded the 2006 normal weather summer peak forecast value (24,234 MW) on 18 days this past summer.

The following table summarizes seasonal forecast peak demands for the Outlook period.

Season	Normal Weather Peak (MW)	Expected Seasonal Peak (MW)	Extreme Weather Peak (MW)
Winter 2006	24,272	24,889	25,791
Summer 2006	24,234	25,926	27,378
Winter 2007	24,526	25,146	26,069

While extreme weather conditions have a lower probability of occurring, history shows that even seasonally average weather will include periods of more extreme conditions comparable to those experienced for long periods over the summer of 2005. Prudent planning dictates that the system be capable of operating reliably for these conditions without significant use of emergency control actions. This requirement drives many of the changes the IESO will be targeting to have in place before summer 2006 and in the longer term.

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1.0 Introduction

This Outlook covers the 18 month period from October 1, 2005 to March 31, 2007. It supersedes the report titled "An Assessment of the Reliability of the Ontario Electricity System from July 2005 to December 2006", dated June 27, 2005. Its purpose is to advise market participants of the resource and transmission reliability of the Ontario electricity system, and to assess potentially adverse conditions that might be avoided through adjustment or coordination of maintenance plans for generation and transmission equipment.

Changes from previous Outlook are outlined in Section 2 and post-seasonal review and preparations for future are described in Section 3. Section 4 describes the load forecast and Section 5 identifies the resources expected to be available during the study period. Section 6 presents an assessment of the adequacy of these resources under the current generation outage program. An assessment of the reliability of the transmission system is presented in Section 7. Overall observations, findings and conclusions are contained in Section 8.

This Outlook presents an assessment of resource and transmission adequacy based on the stated assumptions, and using the described methodology. Readers may envision other possible scenarios, recognizing the uncertainties associated with various input assumptions, and are encouraged to use their own judgement in considering possible future scenarios. This Outlook provides a base upon which updates in assumptions can be considered. The tables contained in the document can be downloaded from the Independent Electricity System Operator (IESO) web site in MS Excel format.

In addition to the comprehensive Outlook, the IESO generally publishes Interim Updates to the 18-Month Outlook during each month for which a full Outlook is not issued. These updates include a spreadsheet which reflects changes to Total Resources, Total Reductions to Resources, and Reserve Above Requirement values for the Planned Resource Scenario. The updates also include a summary of actual demand and forecast demand data. Similar to the full Outlooks, the Interim Updates are posted on the IESO web site. These updates provide Outlook information on a more frequent basis to allow market participants to better adjust their operational plans and outage schedules.

The reader should be aware that Security and Adequacy Assessments are published on the IESO web site on a weekly and daily basis that progressively supersede information presented in this report.

The contents of this Outlook focus on the assessment of resource and transmission adequacy. Other supporting information and forecasts are contained in separate documents. These documents will be updated as required.

- The document entitled "Ontario Demand Forecast from October 1, 2005 to March 31, 2007" (IESO_REP_0252) (found on the IESO web site at http://www.ieso.ca/imoweb/pubs/marketReports/18Month_ODF_2005sep.pdf describes in detail the 18 month forecast of electricity demand for the Ontario Market used in this Outlook. The demand forecast document identifies the assumptions used to determine the forecast and identifies the details regarding peak and energy demand forecasts for the Ontario market and parts thereof. It also contains information regarding variations in

demand due to weather, economic growth and calendar day types. Data from the demand forecast document can be downloaded in MS Excel format from the IESO web site.

- The document entitled "Methodology to Perform Long Term Assessments" (IESO_REP_0266) (found on the IESO web site at http://www.ieso.ca/imoweb/pubs/marketReports/Methodology_RTAA_2005sep.pdf) contains information regarding the methodology used to perform the demand forecasts, resource adequacy assessments and transmission reliability assessments in this Outlook.
- The document entitled "Ontario Transmission System" (IESO_REP_0265) (found on the IESO web site at www.ieso.ca/imoweb/pubs/marketReports/OntTxSystem_2005jun.pdf) provides specific details on the transmission system, including the major internal transmission interfaces and interconnections with neighbouring jurisdictions.

Readers are invited to provide comments on this Outlook report or to give suggestions as to the content of future reports. To do so, please contact us at:

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- Tel: 905-403-6900
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- End of Section -

2.0 Changes from Previous Outlook

Updates to Resources

One of the three shutdown Pickering A nuclear units scheduled to return to service in the fourth quarter of 2005 will result in a projected capacity increase of 515 MW. The Greater Toronto Airports Authority's new 117 megawatt co-generation power plant at Pearson International Airport is being commissioned and is, also, scheduled for commercial operation in the last quarter of 2005. These new generators are not considered to be part of the Existing Installed Generation Resources shown in Table 5.1.

One of the 10 new projects announced in November 2004 from the Request for Proposals for Renewable generation is already in-service. It is the Eastview Landfill Gas project (2.5 MW). Of the rest, 306 MW of wind and 8 MW of hydroelectric generation projects are expected to be available within the 18 month timeframe of this Outlook.

There is a change to the scheduled date for one of four nuclear unit upratings that are scheduled to occur in the 18 month timeframe. The uprating is now scheduled to be completed six months earlier than the previous Outlook.

The Existing Resource Scenario includes almost the same quantity of forecast price-responsive demand as the previous Outlook. By the end of the 18 month study timeframe, in the Planned Resource Scenario, price-responsive demand is forecast to reach 400 MW which is lower than the previous Outlook, due to uncertainty associated with the participation of additional dispatchable demand participants. This capability to reduce demand, based on dispatch signals sent from the IESO, represents an additional resource that may be deployed to maintain the balance between supply and demand.

There have been updates to the generator outages submitted by market participants.

Updates to Transmission Outlook

The list of transmission projects and planned and forced transmission outages has been updated from the previous 18-Month Outlook.

This outlook also presents a discussion of some of the transmission enhancements that are forecast to be required within the outlook period.

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3.0 Post-Seasonal Review and Preparations for Future Operation

This section provides a review of the summer season of 2005, identifying noteworthy observations, developing problems and variations from forecast as appropriate.

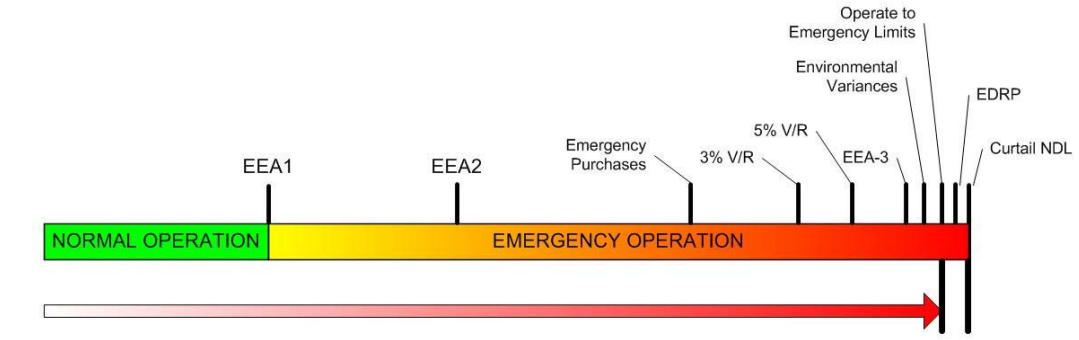
3.1 Emergency Control Actions

When the IESO runs out of market mechanisms to maintain the supply/demand balance, it turns to one or more of the following emergency control actions to maintain reliability. The control actions are listed in the order they are applied and represent actions with increasing impact on customers, the environment and risk to interconnected system reliability.

Emergency Control Actions
Public appeals
Purchase emergency power
Voltage reductions
Environmental variances
Operate transmission to emergency condition limits
Activate Emergency Demand Response Program (EDRP)
Load shedding (also referred to as curtailing Non-Dispatchable Load (NDL))

Figure 3.1 illustrates the typical steps that IESO may take to maintain the supply/demand balance in Ontario. The figure also indicates the timing of several Energy Emergency Alerts (EEA1, EEA2 and EEA3) which provide alerts to Ontario's neighbours to make them aware of the status of reliability in Ontario.

Figure 3.1 Emergency Control Actions



Use of these control actions was a very frequent occurrence this past summer. When emergency control actions must be initiated there is almost no room left to manoeuvre and the impact on customers, the environment and additional risk to interconnected system operation can escalate rapidly. The repeated use of these emergency actions this past summer represented a sustained challenge to Ontario's reliability.

3.2 Weather and Demand Review of Past Season

The weather for the summer of 2005 was consistently above Normal. What makes the summer of 2005 different from other notable summers are the high temperature and humidity experienced in June and the consistency of the temperatures throughout the summer. Both 1999 and 2002 had episodes of higher temperature and humidity but did not exhibit this across all three months. The summer of 2005 had the highest daily average temperature yet it never set a temperature record for any of the weeks.

Figure 3.2 compares the weather from the summer of 2005 with that of 2002 and the Normal and Extreme weather scenarios. The graph depicts the weather impact of the peak day, in MW, for each week of the summer. It is clear that the summer of 2005 was consistently above Normal throughout the summer. The summer of 2002 has the second highest average temperature, yet displays a much more volatile pattern with periods of both mild and extreme weather.

Due to the consistently hotter temperatures of 2005, there were 18 days where the peak demand exceeded the forecasted Normal weather peak demand for the summer of 2006 (24,234 MW).

Figure 3.2 Peak Weather Impact – Summer 2005 Versus 2002, Normal and Extreme Weather

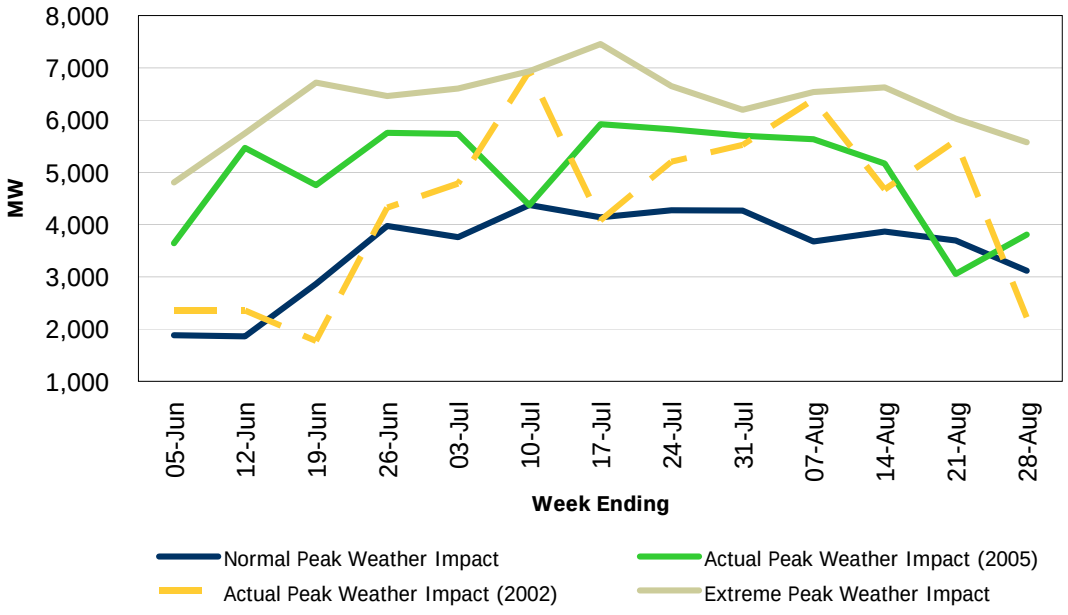


Table 3.1 shows the number of days where the daily high exceeded 30°C and the humidex exceeded 40°C.

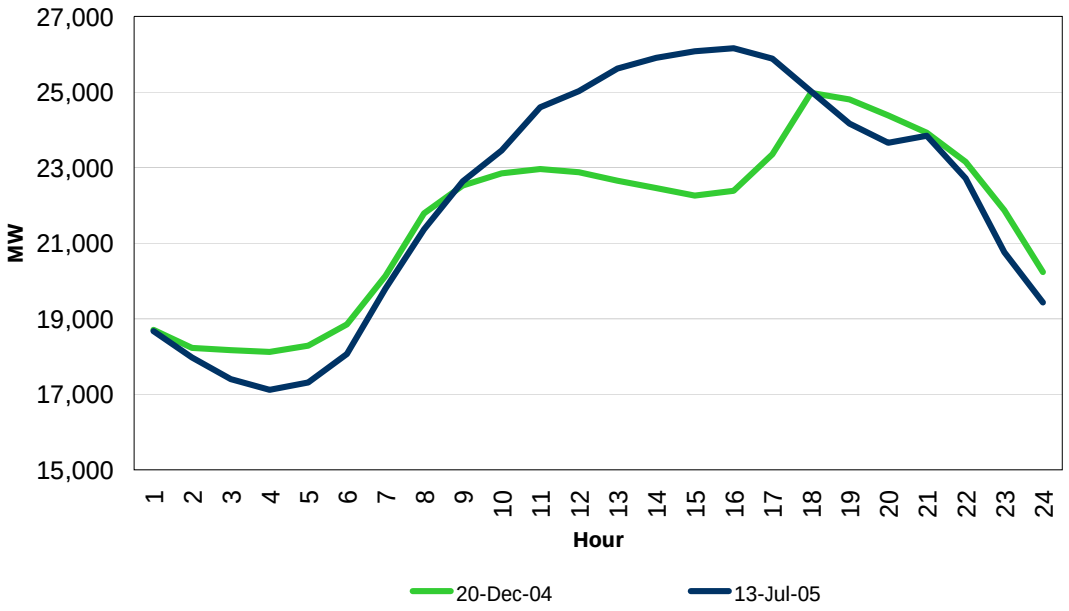
Table 3.1 Number of Days Exceeded 30°C

Number of Days That Exceed	June	July	August	Total
Temperature of 30°C				
2005	9	12	7	28
2002	5	16	8	29
1999	3	15	1	19
1988	8	10	10	28
Average (1970-2004)	2.3	5.1	3.1	10.5
Maximum (1970-2004)	9 (2005)	16 (2002)	10 (1988)	29 (2002)
Humidex of 40°C				
2005	6	6	6	18
2002	1	8	5	14
1999	2	8	0	10
1988	2	3	7	12
Average (1970-2004)	0.9	2.8	1.5	5.3
Maximum (1970-2004)	6 (2005)	11 (1987)	7 (1988)	18 (2005)

Not surprisingly, the hotter than expected weather resulted in higher than expected demand. Energy demand for each of June, July and August were the highest recorded for each of the months. As well, the all-time highest daily energy demand was recorded on July 13th. Each of the monthly peaks were the highest ever recorded for the respective months.

Figure 3.3 shows the hourly profile for the peak days of the winter of 2004-05 and the summer of 2005. As can be seen in the graph, the summer peak is much more sustained as the cooling load grows throughout the afternoon. The winter peak is much shorter and steeper as it is driven by the coincident lighting and heating loads.

Figure 3.3 Winter and Summer Peak Day Hourly Profile



3.3 Resource and Transmission Adequacy Review of Past Season

In addition to the weather related high demand, the hot dry weather limited the amount of water available for hydroelectric production. The hydro energy production for the three summer months of June, July and August of 2005 is about 20 percent lower than what was produced in the same period in 2004. The hydro energy that was actually produced in the three summer months of June, July and August of 2005 was 15 percent lower than the latest energy capability forecast for the same period.

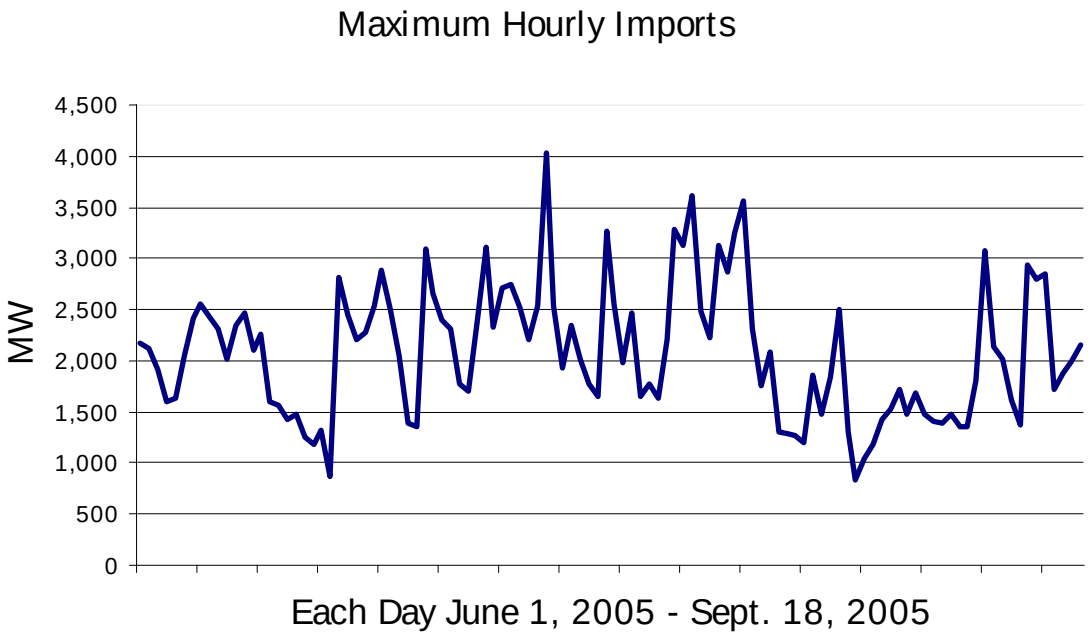
The high demands early in the summer season also meant that water available for hydroelectric use was used up early in the summer and was never replaced by rainfall.

The hot weather also resulted in numerous restrictions to thermal plant production in order to manage heat related environmental restrictions. These restrictions limited the amount of energy that could be produced from one large facility, further aggravating energy management on several days. An algae bloom in Lake Ontario forced three large thermal units from service on one occasion. Fortunately this occurred early in the morning and did not result in immediate need for emergency control actions.

The IESO was anticipating a small increase in generating capacity (~25 MW) by early summer with the upgrading of an existing unit. The unit in question did not return to service from the upgrade outage until mid summer.

The weather, capacity and energy situation during the summer of 2005 resulted in heavy reliance on imports to meet demand, as shown in Figure 3.4.

Figure 3.4 Heavy Reliance on External Supply



As a general observation, the generation in the province performed very well in meeting demand. Facilities were run at high levels for extended periods.

Similarly, the transmission system in Ontario operated very reliably in spite of the need to cancel or defer maintenance to avoid restrictions. However, the system was operated at the limit of capability on many occasions. There were a number of transmission limitations within the province that became more severe as a result of the hot weather;

- Phase shifters at interconnections with New York and Michigan
- The Niagara corridor (QFW)
- The flow into Burlington corridor
- Eastern Ontario circuits
- East-west tie

These restrictions limited the ability to move generation or imports within the province to areas of need.

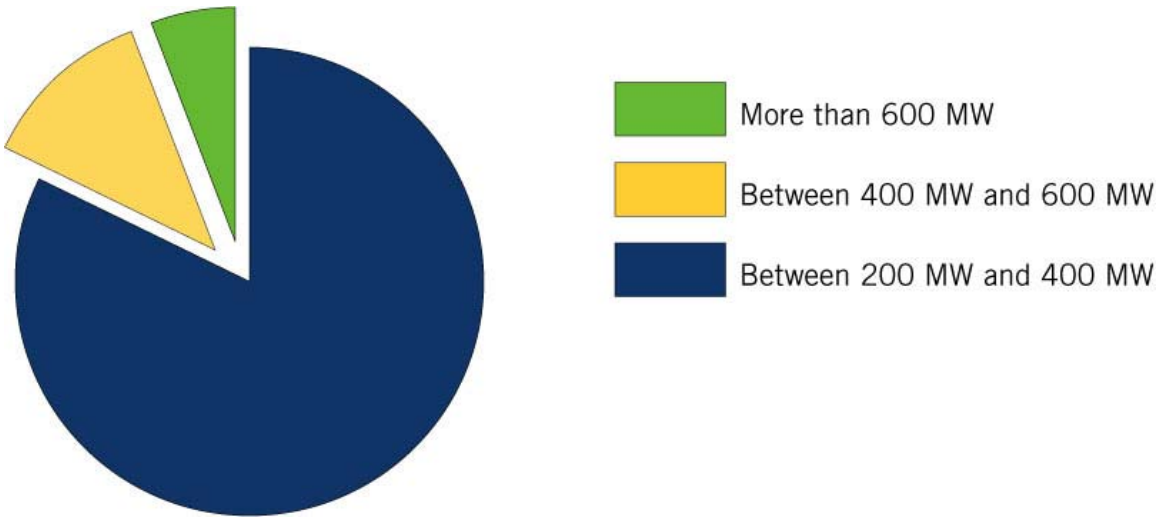
In addition, throughout the summer, flows over Ontario's transmission system from transactions between parties outside Ontario limited the capability to import energy for use within the province by using up valuable transfer capability within Ontario. These flows are called parallel flow and routinely were in the range of 800 to 1000 MW.

Transmission restrictions also occurred within the west GTA. The majority of power in the GTA is supplied through a series of large transformers across the top of the GTA. During periods of high load, or during outages to equipment, these transformers are loaded very close to the maximum allowed. On two separate occasions this summer emergency voltage reductions were required in order to reduce the loading of these transformers to acceptable levels.

Throughout the summer period, Ontario relied extensively on imports from neighbouring markets. On many days the imports reached the maximum of our import capability. Due to transmission restrictions within the province, this capability was often less than the physical capability of the interties.

Given our demand for imported energy, a critical concern with supply this past summer was the frequent failure of large amounts of intertie transactions to be delivered. These failures represent expected supply that is suddenly not available in real-time. The failures are especially problematic due to the timing and size of the failures. These transaction failures are equivalent to losing a large generator, happen at the last minute, occurred almost every day, aggravated the energy shortage in Ontario, and consistently contributed to the need to make repeated use of emergency control actions. The larger the import failures the deeper (and more impactive) the IESO found it necessary to go into emergency control actions. Given that most generation was running, hydro and some thermal production was energy limited, it was a constant challenge to balance supply and demand following these intertie failures.

Figure 3.5 Magnitude of Import Failures



An Emergency Operating State was declared on 5 occasions. Each occasion was necessitated either by the need to maximize internal resources and / or maximize imports into Ontario. The IESO operated to Emergency Condition Transfer Limits on two occasions. One occasion began with a requirement to maximize transfers within Ontario from Quebec and the NY - Adirondack interface. Eventually the need to operate to Emergency Condition Transfer Limits was expanded to remaining portions of Southern Ontario. The second occasion saw the IESO operating to Emergency Condition Transfer Limits to maximize transfers into Ontario from Quebec to maintain import transfer levels on the NY Adirondack interface.

While voltage reductions were scheduled frequently to supplement Operating Reserves, this summer also saw the actual implementation of voltage reductions of up to 5% on the IESO controlled grid on 5 occasions. Three of the occasions were to mitigate local transmission equipment thermal limit concerns. One of these occasions was required to reduce the FETT interface flows when it was deemed that transmission elements affecting the interface may need to be removed due to the proximity of a grass fire. Voltage reductions were also required on two occasions to affect load relief during capacity shortfalls in Ontario. In the later two events, the relief observed was in the order of 400 to 500 MW.

Generators were asked to seek and were granted environmental variances on several occasions. These variances allowed greater amounts of energy to be used from thermal and hydroelectric facilities and were critical in ensuring there was sufficient energy to meet the demand.

In summary, there were a number of factors that contributed to the need for repeated use of emergency control actions, many of them temperature related:

- Load growth
- Extended periods of hot humid weather
- Low hydro-electric energy available

- Environmental limitations to thermal plant production
- Transmission system at its' limit
- Failure of import transactions to Ontario

3.4 Plans to Manage Reliability Risks

Imports

The 18-Month Outlook study assumes no imports into Ontario in the assumed available resources, and in the determination of the Reserve Above Requirement levels. However, the coincident interconnection capability is normally in the range of 3000 to 4,000 MW. Data from market opening through May 2005 reveals that, whenever demand exceeded 23,000 MW, imports averaged about 2,100 MW, and occasionally reached the 4,000 MW import capability level.

Emergency Demand Response Program

The IESO implemented an Emergency Demand Response Program (EDRP) in 2002. Approximately 400 MW of load is contracted under this program. The relief from the EDRP has not been modeled in the 18-Month Outlook. This program load is called to be cut as the last step before rotating load cuts. From a practical perspective, since reduction of this Program load is voluntary, use of this Program would likely occur at the same time as rotational load shedding. No EDRP load or rotational load shedding was required this past summer.

Outage Planning

Every quarter, the IESO assesses the integrated generator and transmission outage plans of market participants. Periods where outages result in inadequate resource levels are identified to generators and transmitters. If market participants fail to proactively reschedule outages to mitigate concerns, the IESO may veto outages in the near-term to ensure sufficient capacity is available to meet non-dispatchable demand.

The relief which can be expected from this measure can amount to over 2,000 MW during the summer months and more during other periods. Deviation from initial generator outage plans through outage rescheduling and rejection are not always desirable. This could stretch the ability of generator owners/operators to accommodate larger amounts of outages over shorter time periods and may increase forced outage occurrences. Operational experience so far indicates generator owners are usually able to adapt their outage plans. However, the dual peaking nature of the Ontario system (roughly equivalent peaks in winter and summer) means that outages must be scheduled in shorter spring and fall periods. Inevitably this means that some long duration outages have to be scheduled into the start of the peak seasons, creating the potential that any extensions of these outages occur when the generastion is most needed.

Lessons Learned from Summer 2005

Operation in 2005 provided several lessons;

1. We must continue to actively plan for conditions such as those experienced this past summer
2. Hot summer weather can have many coincident effects.
    - During extended periods of hot humid weather the demand, as expected, reached high levels.

- Unless the capacity situation in Ontario is very robust, these levels of demand require substantial reliance on imports.
- Temperature related effects limit key transmission interfaces which restricts utilization of capacity and energy both within the province and from neighbouring systems
- Hot humid conditions often result in reduced hydro-electric energy production
- Temperature related environmental limitations can result in significant reductions in thermal plant production

3. Chronic transaction failures near real-time leave insufficient time to respond reliably
4. We must increase the certainty of operational plans close to real-time

Plans

There are a number of projects underway in Ontario that will make a significant contribution to supply and transmission capability in the province, as described in this Outlook and the recent 10 year Outlook published by the IESO. Construction of these facilities, some of which are underway, takes time. At this time we must make incremental steps and consolidate preparations to deal with the types of difficult conditions experienced this past summer. This involves steps to maintain and improve generation, transmission and import capability to the extent possible, and move some market mechanisms to the day ahead to increase the certainty of supply availability in real-time and to provide enough time to plan for rather than react to problems.

The following actions are planned to improve the capability of existing resources:

- Resolve generation dispatch issues (e.g. aggregation, frequency of dispatch)
- Make full use of phase shifters with Michigan to control parallel flows
- Review the use of environmental variances within the list of emergency control actions
- Incremental additions to the transmission system to increase capabilities as described in the transmission adequacy section of this report

The following actions are planned to increase the certainty of market mechanisms:

- Allow imports to be scheduled day ahead like all of the markets surrounding Ontario
- Commit generating units day ahead like all of the markets surrounding Ontario
- Implement an Emergency Demand Response Program like the markets surrounding Ontario

In addition, we plan to review IESO's operations and planning processes and criteria to ensure forecast risks are adequately recognized.

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4.0 Demand Forecast

The forecast of demand has been updated to reflect the most recent information. As part of the regular updating process, the forecasting models' equations are re-estimated based on recent economic, weather and demand data. The weather experienced over the summer of 2005 and the resulting demands have shown that the system continues to become more heat sensitive

The Weather scenarios are also updated for the most recent weather data. As such, all scenarios have been impacted by the weather of this past summer. Warmer weather scenarios combined with an increased sensitivity to higher temperatures has led to higher peak demand forecasts over the summer of 2006.

The economic outlook has also been updated and is not significantly different from the previous forecast. Expectations are for slower economic growth than experienced over the past few years. The government has set aggressive targets for energy conservation to reduce peak electricity consumption by 5 per cent by 2007. However, because the impact of new conservation initiatives is as yet difficult to forecast, the effects of these new conservation efforts are not reflected in the Ontario demand forecast used in this Outlook. These conservation efforts can make a significant difference.

The combination of higher than expected summer demand and a virtually unchanged economic forecast means that energy demand is very similar but peak demand – particularly over the summer of 2006 - is higher than in the previous forecast. Annual energy demand is expected to grow by 1.2% and 0.9% in 2005 and 2006 while weekly peak demands are, on average, roughly 130 MW higher than for the same period in the previous forecast.

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5.0 Resources

This section describes the generation resources that were considered in this Outlook based on information available to the IESO.

5.1 Existing Generation Resources Included in this Assessment

The existing installed generating capacity within Ontario is summarized in Table 5.1. This includes nuclear, coal, oil, gas, hydroelectric, wood, land fill gas and waste-fuelled generation, and results in a total capacity of 30,116 MW.

The capacity of installed generation resources in Table 5.1 does not include Pickering A Unit 1 Bruce Units 1 and 2 and the Greater Toronto Airports Authority's new co-generation power plant.

Table 5.1 Existing Installed Generation Resources

Fuel Type	Total Capacity (MW)	Number of Stations
Nuclear	10,882	5
Coal	6,434	4
Oil / Gas	4,976	20
Hydroelectric	7,756	67
Miscellaneous	68	3
Total	30,116	99

The number of stations has increased by one since the last Outlook,with the establishment of a new land fill gas generating station as part of the 395 MW of generating capacity from the renewable sources (wind, water and land fill gas) the government procured through its Request for Proposals. The new station is Eastview Landfill Gas with the installed capacity of 2.5 MW. The other eight of the 10 successful renewable projects are expected to come into service within the 18-month timeframe.

For purposes of determining a station count by fuel type, each generating station has been assigned a single fuel type based on the primary fuel consumed at the station. The category Miscellaneous includes land fill gas, wood and waste-fuelled generating stations.

5.2 Potential Generation Resource Additions

Table 5.2 summarizes the significant new generation facilities that are scheduled to come into service within the 18 month study period. This includes projects in the IESO's Connection Assessment and Approval (CAA) process that are under construction and projects selected under the RFP process which are scheduled to be placed in-service within the 18 month study period. Generator owners or operators have provided the information regarding the status of their projects and the in-service dates listed in Table 5.2.

Table 5.2 Committed and Contracted New Generation Resources and Demand Side Projects

Proponent/Project Name	Zone	Fuel Type	Capacity MW	Connection Applicant's Estimated I/S Date
Pickering Unit 1	Toronto	Uranium	515	2005-Q4
Greater Toronto Airports Authority	Toronto	Gas	117	2005-Q4
Kingsbridge Wind Power Project	Southwest	Wind	40	2005-Q4
Melancthon Grey Wind Project	Southwest	Wind	68	2006-Q1
Erie Shores Wind Farm	Southwest	Wind	99	2006-Q1
Loblaws Properties	distributed	Demand	10	2006-Q2
Prince Wind Farm	Northeast	Wind	99	2006-Q3
Total			**948**	

The Ontario Government RFP for 300 MW of renewable resources resulted in a total of 10 successful projects that add up to 395 MW of installed capacity. One of these 10 new projects is already in-service. It is the Eastview Landfill Gas. Of the rest, about 350 MW of wind and 8 MW of hydroelectric generation projects are expected to be available within the 18 month timeframe of this Outlook. It should be recognized that each MW of installed wind capacity may not reliably be available to meet demand when capacity is needed. Some of these renewable resources may only contribute intermittently to meeting Ontario demand. For each of the renewable generation projects, the amount of dependable capacity that can be relied on to meet peak demand will need to be determined.

A study with several members of the Canadian Wind Energy Association, CanWEA, released in the spring of 2005 concluded that the median capacity contribution which can be expected from wind generation would range from about 47% in the winter to 19% in the summer. Other areas in North America typically rely on 2% to 30% of the installed capacity of intermittent wind powered generation, but this amount varies depending on the prevailing wind patterns, and how the resulting generation pattern coincides with peak demand. Until actual wind generation information from the province is available, the capacity and energy contributions from these projects are assumed to be 10% and 30% respectively.

Four of the 10 renewable generators that are embedded in the distribution network or are displacing a wholesale market load have the option of participating directly in the wholesale market, or of reducing the wholesale market load of the consumer that is directly participating in the wholesale market. The one renewable generator already in-service chose to participate directly in the wholesale market.

Details regarding the IESO's CAA process and the status of all projects in the CAA queue, including copies of available Preliminary Assessment and System Impact Assessment Reports, can be found on the IESO's web site www.ieso.ca under the "Services - Connection Assessments" link. There are also a number of smaller generation capacity changes that may occur during the forecast timeframe. For this Outlook timeframe, the combined result of these generator capacity changes is about 100 MW. Some of the smaller capacity changes may not be significant enough to require the formal CAA process, and therefore not all of the capacity additions may have a project listed in the CAA queue.

5.3 Summary of Resource Scenarios

In assessing future resource adequacy, it is necessary to make a number of assumptions regarding the magnitude of resources expected to be available for operation. Two resource scenarios were considered in this Outlook: an Existing Resource Scenario and a Planned Resource Scenario. Both resource scenarios were established starting from the existing installed resources shown in Table 5.1.

Under the **Existing Resource Scenario,** Ontario generation resources identified in Table 5.1 were assumed to be in-service for the entire duration of the study period. This resource scenario assumed that none of the additional generation resources listed in Table 5.2 would be placed in service over the study period but generation capacity increases of about 100 MW to existing generation facilities would occur. The existing resource scenario includes 360 MW of price-responsive demand capability. This value is based on the existing capability of price-responsive demands such as the existing dispatchable loads to decrease demand based on signals from the IESO. Such decreases to demand result in an incremental decrease to demand below the level of the published demand forecast values.

Under the **Planned Resource Scenario** existing Ontario generation resources were assumed to be in-service for the entire duration of the study period. Additionally, all potential generation additions listed in Table 5.2 were included in this scenario. Price-responsive demand capability is forecast to be higher under the Planned Resource Scenario, compared to the Existing Resource Scenario. By the end of the 18 month study timeframe, price-responsive demand is forecast to increase to 428 MW, due to continuing increases in the amount expected to be offered into the IESO-administered markets.

Forecasts of available resources were derived for each of the two resource scenarios described above, using information regarding generator output capabilities, planned outages, allowances for hydroelectric generation production below rated capacity, assumptions for the amount of price-responsive demand, and major transmission interface limitations.

Table 5.3 shows a snapshot of the forecast available resources, under the two scenarios, at the time of the seasonal peak demands over the study period. The installed resources in Table 5.3 start with the values listed in Table 5.1. The installed resources in Table 5.3 increase over the study timeframe, due to some increases in the forecast net installed capacity of existing generation facilities. For the Planned Resource Scenario only, resources are also increased by the generation additions listed in Table 5.2. The total reductions to resources include generator deratings, generator planned outages under each resource scenario, capacity limitations due to transmission interface constraints and allowances for hydroelectric generation production below rated capacity. The total reductions were subtracted and the price-responsive demand was added to the total resources, to obtain the available resources. In this Outlook, price- responsive demand ranges from 365 MW to a maximum of 428 MW under the Planned Resource Scenario, as shown in Table 5.3.

Table 5.3 Summary of Available Resources

Notes	Description \ Year	Winter Peak 2006		Summer Peak 2006		Winter Peak 2007	
		Existing Resource Scenario	Planned Resource Scenario	Existing Resource Scenario	Planned Resource Scenario	Existing Resource Scenario	Planned Resource Scenario
1	Installed Resources (MW)	30,141	30,813	30,192	31,031	30,218	31,156
2	Imports (MW)	0	0	0	0	0	0
3	Total Resources (MW)	30,141	30,813	30,192	31,031	30,218	31,156
4	Total Reductions in Resources (MW)	2,322	2,358	1,802	1,988	1,483	1,763
5	Price-responsive Demand (MW)	360	410	360	428	360	428
6	Available Resources (MW)	28,179	28,865	28,750	29,470	29,095	29,820

Notes to Table 5.3:

1. Installed Resources (MW): This is the total capacity of the generation resources in Ontario assumed to be installed at the time of the summer and winter peaks in the 18 month time span. Initially, this value includes all generators registered to participate in the IESO-administered markets at the beginning of the 18 month period. It also reflects minor unit re-ratings resulting from equipment upgrades that occurred prior to the publication of this Outlook. Only one of the four Pickering A nuclear units is included in the existing installed generation resources. Additional generation capacity that was assumed under the applicable resource scenario is progressively included, according to the estimated in-service dates.

2. Imports (MW): Represents the amount of external capacity considered to be delivered to Ontario.

3. Total Resources (MW): This is the sum of Installed Resources (line 1) and Imports (line 2).

4. Total Reductions in Resources (MW): These reductions represent, under each of the two scenarios, the sum of generator deratings, generator planned outages under each resource scenario, generation limitations due to transmission interface constraints and allowances for hydroelectric generation production below rated capacity.

5. Price-responsive Demand: This is the amount of demand which is assumed to respond to changes in the market clearing price by reducing consumption, under each resource scenario.

6. Available Resources (MW): This equals Total Resources (line 3) minus Total Reductions in Resources (line 4) plus Price-responsive Demand (line 5).

5.4 Energy Production Capability Forecast

The monthly forecast of energy production capability, as provided by market participants, is included in Appendix A, Table A6.

- End of Section -

6.0 Resource Adequacy Assessment

This section provides an assessment of the adequacy of the resources described in Section 5 to meet the forecast demand. The purpose of the two resource scenarios described in Section 5.3 is to present a range of possible outcomes, in recognition of the uncertainty which exists regarding the future availability of resources. The Existing Resource Scenario, which assumes no new generation resource additions and a base amount of price-responsive demand, represents the lower boundary of the range, considering the potential for delays to the in-service dates of additional generation capacity, and additional price responsive demand capability. The Planned Resource Scenario assumes additional quantities of price-responsive demand and generation capacity additions based on project status and in-service date estimates. This scenario represents the higher boundary of the outcome range.

Results of the adequacy assessment, as well as an analysis of risk factors, are described in Sections 6.1 through 6.5. Observations, findings and conclusions are provided in Section 8, and detailed tables of results can be found in Appendix A of this document.

6.1 Weekly Adequacy Assessment

The assessment of weekly adequacy takes into consideration a range of forecast demands based on a probability distribution of historical weather data. Reserve Above Requirement levels have been calculated assuming both normal weather (with an allowance for the probability of experiencing extreme weather) and assuming extreme weather (with no further allowance for weather uncertainty). Figure 6.1 shows the normal and extreme weather demands assumed for each week in the study period.

Figure 6.1 Demand Forecast Range

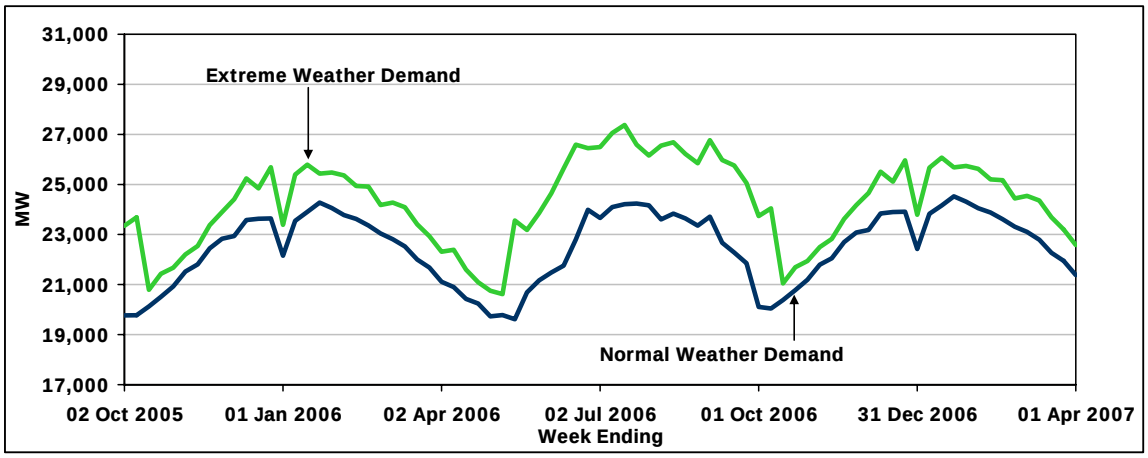


Figure 6.2 shows the Total Reductions in Resources used in the calculation of the Available Resources (as described in Section 5.3).

Figure 6.2 Total Reductions in Resources

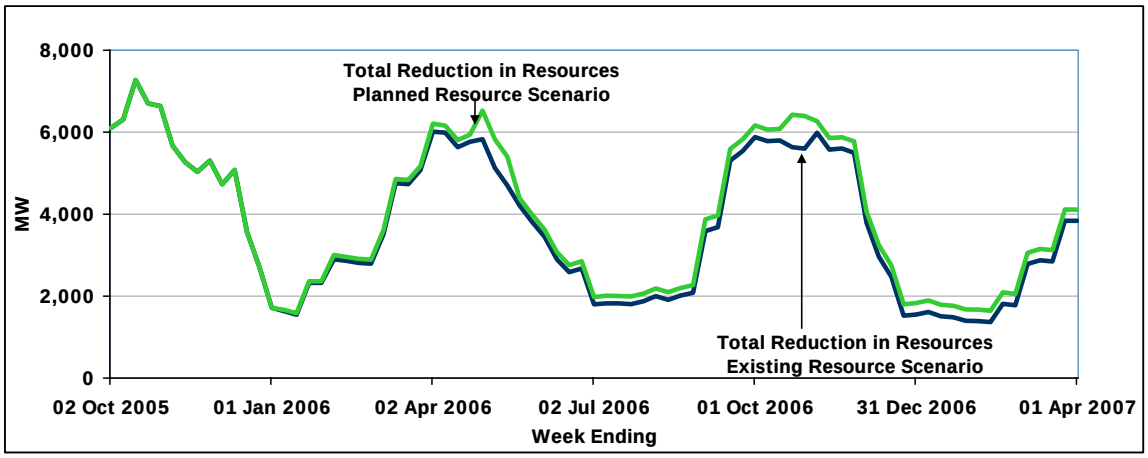


Figure 6.3 provides a comparison between Available Resources, and Required Resources for each week, for the Existing Resource Scenario. The latter quantity is the sum of Demand and Required Reserve, and is based on a probabilistic calculation, which takes into account load forecast uncertainty due to weather and random generator forced outages. Figure 6.4 provides a similar comparison for the Planned Resource Scenario.

Figure 6.3 Available vs. Required Resources: Existing Resource Scenario

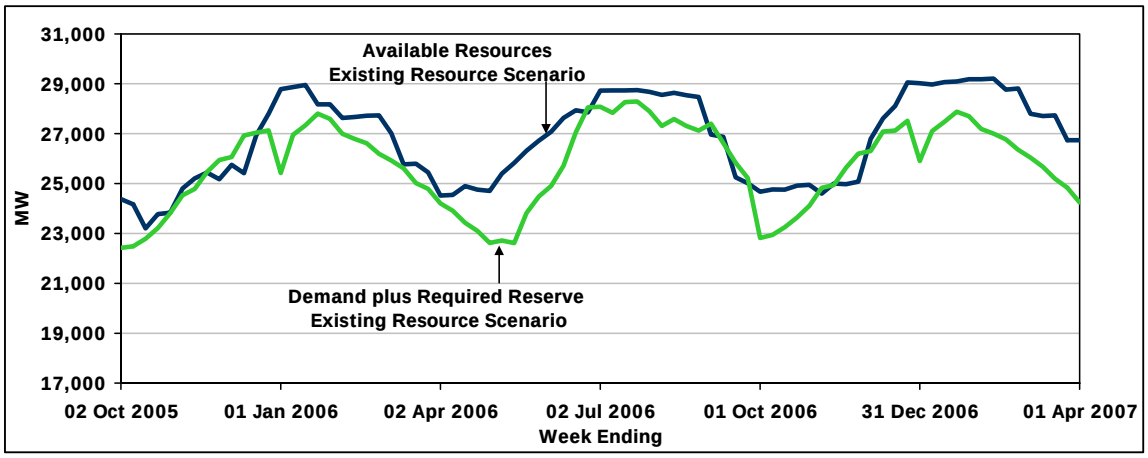
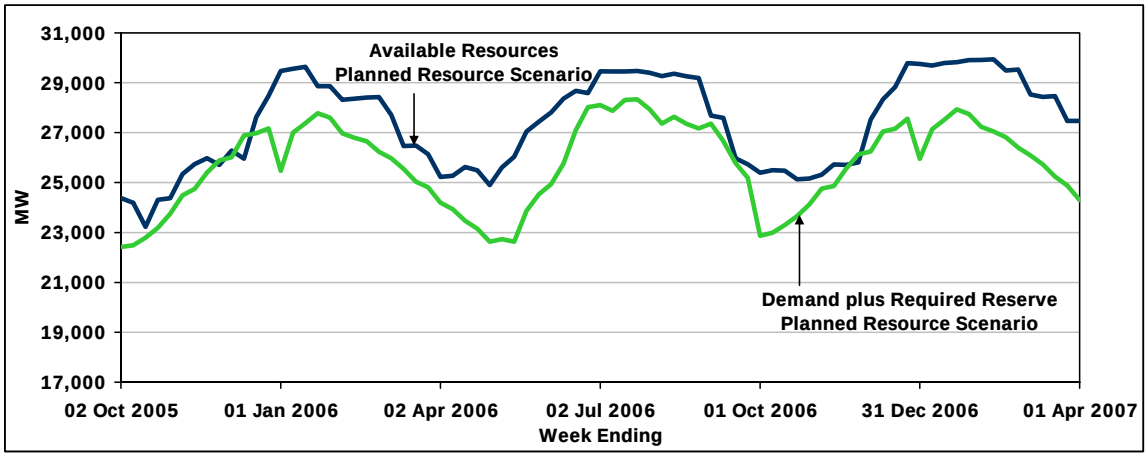
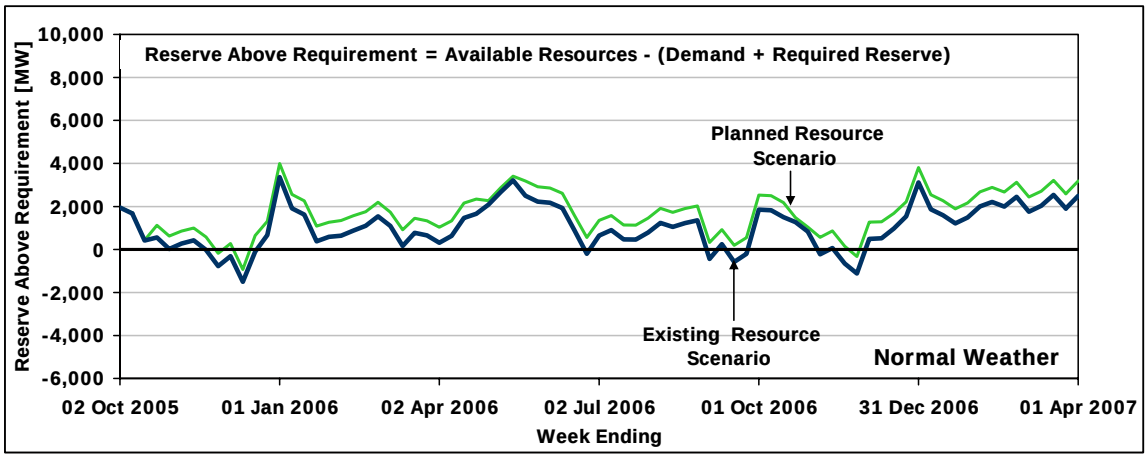


Figure 6.4 Available vs. Required Resources: Planned Resource Scenario



Reserve Above Requirement levels, which represent the difference between Available Resources and Required Resources, are shown in Figure 6.5 for each resource scenario studied.

Figure 6.5 Reserve Above Requirement: Existing Resource Scenario and Planned Resource Scenario



Under the **Existing Resource Scenario**, the forecast reserves are generally adequate for the study period. Reserves are forecast to be below requirements for 12 weeks of the 18 month study period. During these weeks some planned generator outages are at risk of cancellation or deferral by the IESO for reliability purposes depending on their priority and the resource adequacy situation at the time outage approval is being sought.

The results above must be assessed considering the risk factors described in Section 6.3 and the probability of this scenario occurring. During most of the study period, a combination of high demand levels under extreme weather conditions and lower than forecast levels of available resources would lead to reliance on imports and upward pressure on the wholesale market prices.

Under the **Planned Resource Scenario**, the resource adequacy situation is improved compared to the Existing Resource Scenario. For all but three weeks of the Outlook timeframe, the forecast

available resources exceed the planning requirements. To the extent this scenario materializes, opportunities will exist for additional planned generator maintenance and exports. Again, the risk factors described in Section 6.3 must be considered.

Figures 6.6 and 6.7 provide a comparison between the forecast Reserve Above Requirement values in the present Outlook and the forecast reserve above requirement values in the previous Outlook published on June 27, 2005. Under both the Existing Resource Scenario and the Planned Resource Scenario, the combined changes in forecast demands, price-responsive demand and generator planned outages yield generally the same resource outlook for the overlapping period when compared to the previous 18-Month Outlook.

Figure 6.6 Reserve Above Requirement: Existing Resource Scenario vs. Previous Existing Resource Scenario

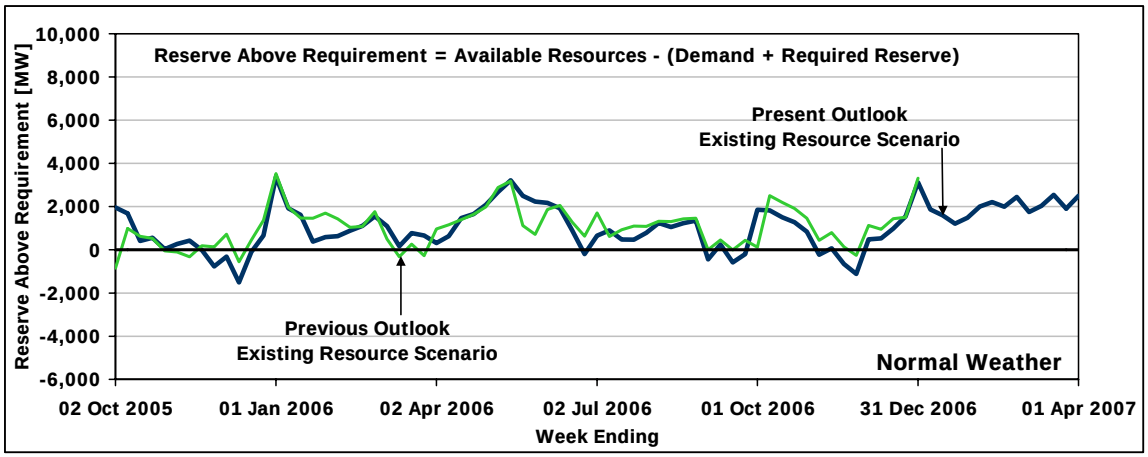
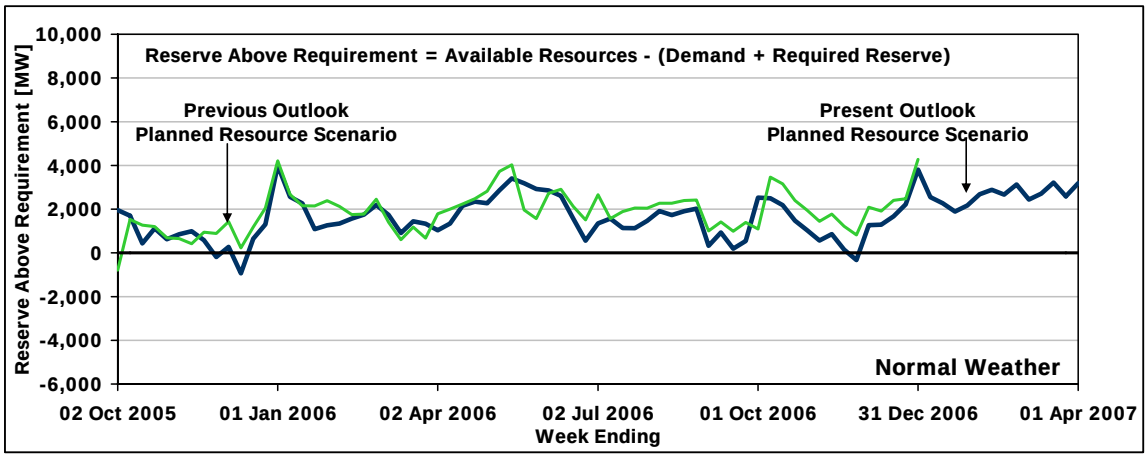


Figure 6.7 Reserve Above Requirement: Planned Resource Scenario vs. Previous Planned Resource Scenario



6.2 Loss of Load Expectation

Loss of Load Expectation (LOLE) simulation results indicate that, in order to achieve the NPCC target LOLE, only a minimal level of additional resources would be required, sufficient to offset the reserve deficiencies under the existing resource scenario shown in Table A1 in Appendix A.

6.3 Resource Adequacy Risks

The forecast reserve levels for both the Existing Resource Scenario and the Planned Resource Scenario should be assessed bearing in mind the risks discussed below. Each of these risks, whether considered alone or in combination with the others, could result in lower than forecast reserve levels and the need for higher levels of imports or curtailment of planned outages.

6.3.1 Extreme Weather

The Existing Resource Scenario and the Planned Resource Scenario are based on the assumption of normal (average) weather. However, peak demands in both summer and winter typically occur during periods of extreme weather. Unfortunately, the occurrence and timing of extreme weather is impossible to accurately forecast far in advance. As a result, the impact of extreme weather is modeled probabilistically in the calculation of the required resources for each week of the study period. The impact of extreme weather was demonstrated in July 2005, when Ontario established an all-time record demand of 26,160 MW. Approximately 1,600 MW of this demand was due to the higher than average heat and humidity.

In order to illustrate the impact of extreme weather on forecast reserve levels during the Outlook period, both the Existing Resource Scenario and the Planned Resource Scenario were re-calculated assuming extreme weather in each week instead of normal weather. The probability of this occurring in every week is infinitesimally small; however the probability of an occurrence in any given week is greater (about 2.5 percent). When one looks at the summer or winter periods, the expectation of at least one occurrence of extreme weather becomes considerably higher. Results for extreme weather are shown in Figures 6.8, 6.9, and 6.10.

The magnitude of resource deficiencies, under extreme weather, clearly illustrates there are circumstances under which reliance on interconnected supply is likely. This emphasizes the continued need for reliable supply and demand response within Ontario.

Figure 6.8 Available vs. Required Resources: Existing Resource Scenario Extreme Weather Demand

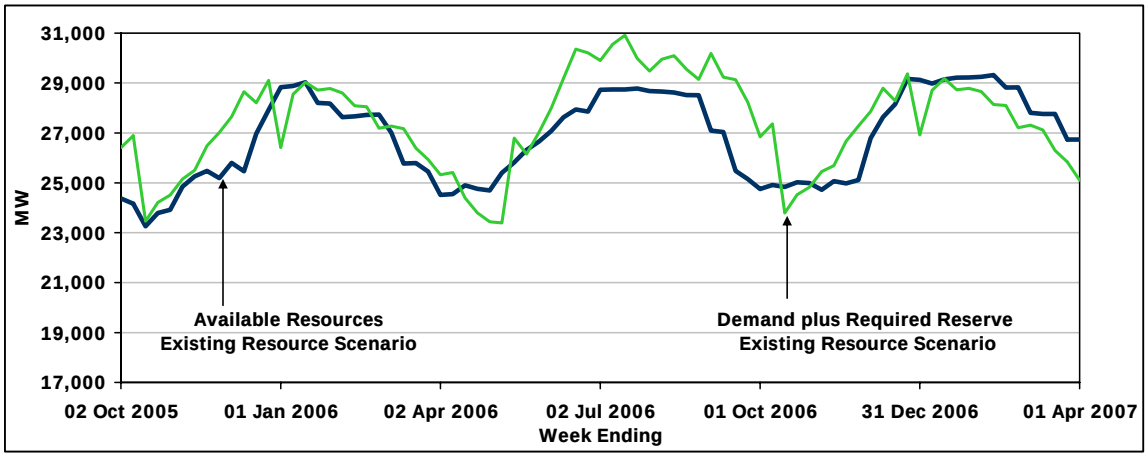


Figure 6.9 Available vs. Required Resources: Planned Resource Scenario Extreme Weather Demand

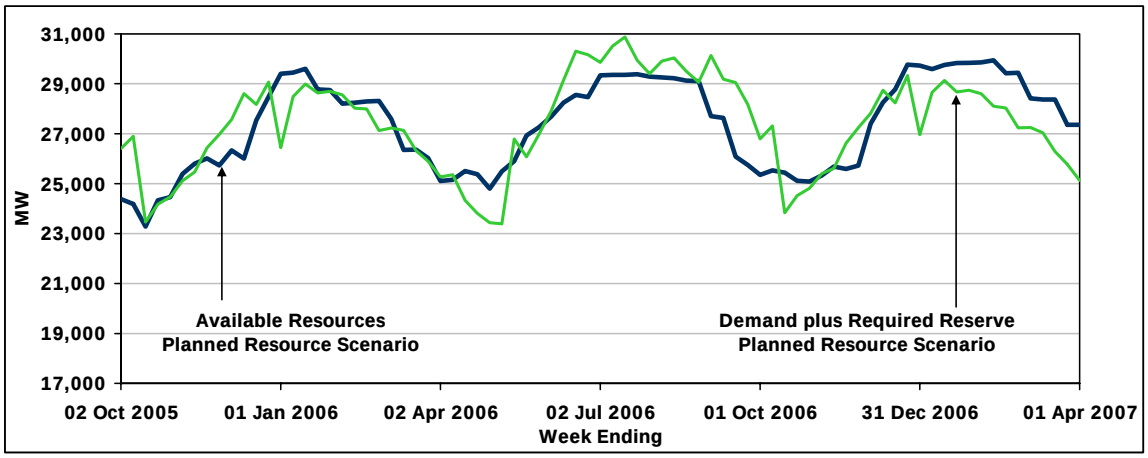
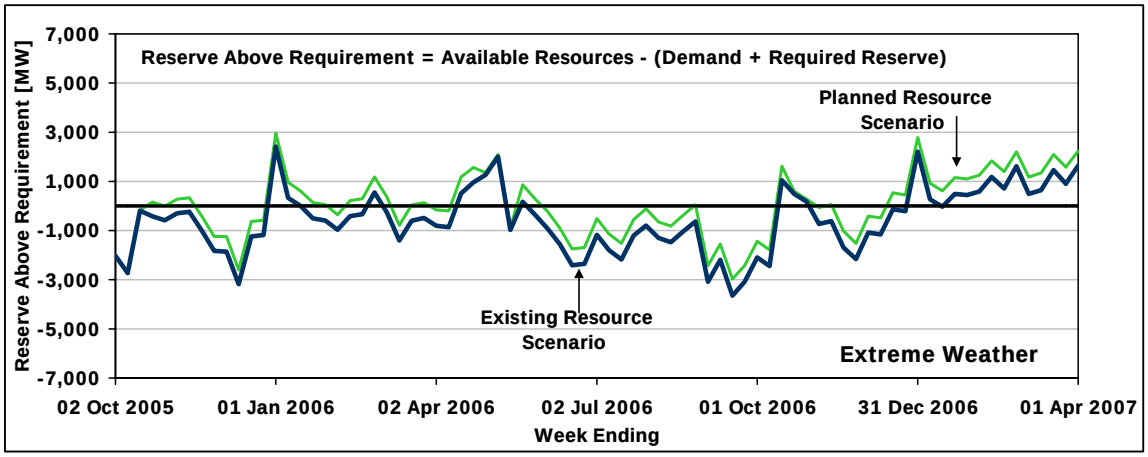


Figure 6.10 Reserve Above Requirement: Existing Resource Scenario and Planned Resource Scenario, Extreme Weather Demand



6.3.2 New Resource Risks

For the 18 month period under study, the improved demand-supply situation for the Planned Resource Scenario is dependent on the additional generation and price-responsive demand coming into service as forecast.

6.3.3 Extensions to Generator Planned Outages

A number of large generating units are scheduled to return to service from outage prior to winter 2005/2006 and summer 2006. Meeting these schedules is critical to maintaining adequate reserve levels. Delays in returning generators to service from maintenance outages could lead to reliance on imports and/or cancellation of planned generator outages.

6.3.4 Higher than Forecast Generator Unavailability

IESO resource adequacy assessments include a probabilistic allowance for random generator forced outages based on generator reliability information provided by market participants, or on

industry-wide data for similar facilities. Along with weather-related demand impacts, the impact of generator forced outages is included in the determination of required resources.

6.3.5 Lower than Forecast Hydroelectric Resources

IESO resource adequacy assessments include forecast amounts of hydroelectric generation provided by market participants. The amount of available hydroelectric generation is greatly influenced both by water-flow conditions on the respective river systems and by the way in which water is utilized.

Water-flow conditions are primarily influenced by the amount of precipitation received. To accurately forecast precipitation amounts far in advance is little better than chance. Drought conditions over some or all of the study period would lower the amount of generation available from hydroelectric resources.

6.3.6 Capacity Limitations

There is a risk that any given generator may not be capable of producing the maximum capacity at the time of peak demand. The forecast models do include an equivalent forced outage rate, that is intended to capture the random nature of generator capacity limitations or derates, together with the random nature of generator forced outages. There a risk that actual outages and derates may be higher than forecast, and there is also a risk that certain types of derates or outages may not be completely random. Some outages and derates, such as environmental limitations, may be more likely to occur at roughly the same time as the extreme weather conditions which result in peak demand.

In addition, the forecast models assume that the maximum capacity of any given generator may be utilized fully at the time of the Ontario peak demand, although there are risks that the peak utilization of all generating resources may not be available in the same peak hour, due to interrelationships between generating resource fuel availability.

6.3.7 Transmission Constraining Resource Utilization

There is a risk, as experienced this past summer, that transmission constraints occur more often than expected, or have greater impact than expected on the ability to deliver generation to load centres. A limited number of transmission limitations are modeled without all probabilities of failure included. There is a risk that certain transmission limitations, which are not modeled, may have a greater impact than forecast and/or failures could occur to significantly impact the utilization of resources, until such equipment is repaired or replaced. This can affect the utilization of internal generation and imports from neighbouring systems.

6.3.8 Failure of Import Transactions

There is a risk, as experienced this past summer, that import transactions scheduled with neighbouring markets frequently fail to be delivered. These failures represent expected supply that is suddenly not available in real-time. The failures are especially problematic due to the timing and size of the failures.

6.4 External Resources

An analysis of historical power flows on Ontario's interconnections for the five years prior to 2002 shows that, outside of summer peak demand periods, up to 1,800 MW of external generation resources has typically been imported into Ontario. During Ontario's summer peak demand periods of July and August imports are expected to be required and imports are expected to be available despite the fact that many neighbouring systems are often experiencing their peak demand. This is mainly due to the availability of spare capacity from systems that are not summer peaking. From the same analysis, up to 1,400 MW would be expected to be available based on observations during summer peak months in recent years prior to 2002.

The actual hourly import levels experienced from market opening indicates an average import level of about 1,161 MW for all hours. During the hours when Ontario demand exceeded 20,000 MW the average import level was about 1,478 MW. During the hours when Ontario demand exceeded 23,000 MW the average import level was around 2,192 MW, and occasionally reached the Ontario coincident import capability of approximately 4,000 MW.

Future levels of imports into Ontario will vary depending on several factors, including the availability and willingness of resources in external jurisdictions to supply the Ontario market, and the availability of required transmission capacity either within or outside of Ontario.

6.5 Energy Conservation and Peak Reduction through Demand Response

The IESO has been identifying the suitability of demand-side initiatives as part of the supply picture for several years and believes demand reductions and demand shifting should be vigorously pursued in Ontario, as clean and potentially less expensive ways to reduce future supply requirements. The application of such conservation measures is virtually unrestricted in location.

Programs would improve the supply-demand balance in two main ways:

- Demand reduction through technological or process efficiency improvements would have beneficial effects on the environment and reduce the need for generation capacity additions.
- Shifting the time of use from peak to off-peak periods through demand-response programs would achieve peak demand reductions, influencing electricity prices downward and improving utilization rates of generation resources.

- End of Section -

7.0 Transmission Reliability Assessment

This section provides an assessment of the reliability of the Ontario transmission system.

7.1 Transmission Projects

Committed transmission projects, summarized in Appendix B by transmission zone, represent a subset of the transmission projects in the Connection Assessments and Approval queue. Only those projects that have a significant impact and that have an estimated in-service date within the 18 month period under study are listed. To make cross referencing easier, the CAA-ID number of each project has been included. In general, the work listed below represents some or all of the work associated with the CAA-ID.

Additional information regarding each of the transmission projects in the CAA queue can be found at the IESO's Connection Assessments web-page, at the following location:

http://www.ieso.ca/imoweb/connAssess/ca.asp.

7.2 Adequacy of the Existing Transmission System

IESO analysis over the past year has shown several areas where the adequacy of the IESO-controlled grid may not be sufficient to reliably supply the Ontario demand for electricity, or may congest internal resources combined with imports to supply the expected Ontario demand. A review of the actual operation of the IESO-controlled grid for the preceding season (Summer 2005) supports several of these findings and has highlighted the need for new transmission enhancements or for advancing previously proposed projects.

7.3 Western GTA

By June 2006, the IESO is expecting Hydro One to have completed the Parkway project such that the second autotransformer is fully connected into the 230 kV system, that Cherrywood T14 is repaired and its normal ratings restored, and that at least one spare 750 MVA, 500/230 kV, autotransformer is in stock. The fulfillment of these requirements is vital to the reliability of the western GTA. Operation during the summer 2005 showed heavy loading on all the 500/230 kV autotransformers in the GTA, to the extent that the permanent failure of one transformer during peak periods would have likely required load interruptions. The transformers at Claireville and Trafalgar experienced the heaviest loading.

New supply is urgently needed in the western GTA to unload the autotransformers at Claireville TS, to accommodate load growth, to support the transfer of downtown Toronto load normally supplied from Leaside to Manby TS, and to control voltages in the western GTA.

The IESO's specific capacity requirements for new supply in the western GTA are described in the documents linked below. Many of these requirements fall into the period of this outlook.

http://www.ieso.ca/imoweb/pubs/rfp/IESO_Requirements-Western_GTA_Supply.pdf

http://www.ieso.ca/imoweb/pubs/rfp/IESO_Requirements-Western_GTA_addendum.pdf

For additional detail, the recent 10 year outlook provides the rationale and statement of need. Section 4.1 and Greater Toronto Area section of the Conclusions address these areas specifically: http://www.ieso.ca/imoweb/pubs/marketReports/10YearOutlook_2005jul.pdf

7.4 Dowtown Toronto

The downtown area of Toronto is supplied from two sources; Manby TS in the west and Leaside TS in the east. As load continues to grow, the supply to downtown Toronto will be exposed to the potential overload of:

- The 230 circuits from Cherrywood to Leaside,
- the Leaside autotransformers,
- the 115 kV circuits from Leaside to Hearn,
- the auto-transformers at Manby East and Manby West, and
- the 230 kV circuits from Richview to Manby.

These combined issues will be addressed in the short-term through load transfers using the John to Esplanade link, and by additional generation supplemented with conservation and demand management. These requirements are forecast to be needed beyond the time period of this outlook, but high load growth could advance the need to the summer of 2006, and procurement must be expedited to the extent possible.

The requirements for new downtown supply are described in the document linked below.
http://www.ieso.ca/imoweb/pubs/rfp/IESO_Requirements-Downtown_Toronto_Supply.pdf

For additional detail, the recent 10 year outlook provides the rationale and statement of need. Section 4.2 and Toronto section of the Conclusions address these areas specifically:
http://www.ieso.ca/imoweb/pubs/marketReports/10YearOutlook_2005jul.pdf

7.5 Windsor Area

The recent 10-year Outlook identified the operational problems and congestion in the Windsor area. Thermal ratings of the 115 kV circuits and the two 230/115 kV autotransformers at Keith TS often congested local generation, limited imports from Michigan and relied on the arming of local special protection systems for extended periods of time. For summer 2005 operation, the loading on 115 kV circuit J4E exceeded the summer design rating for about 150 hours, requiring extensive arming of the local special protection system, and restricting imports over J5D.

Upgrades in the area were identified in the 10-year outlook. The most urgent requirements, expected to be needed before summer 2006, are the reconfiguring of the 115 kV circuit terminations at Essex TS, (the opposite terminal station for J3E and J4E), the modification of the Windsor Area SPS, and the re-conductoring of J3E and J4E. The replacement of the Keith TS autotransformers with higher rated units is expected to be needed by fall of 2006.

7.6 Beck-Middleport-Hamilton/Burlington circuits (QFW)

The westward circuits from Beck towards Middleport and Hamilton/Burlington (often referred to as the QFW interface) were often limiting in summer 2005 and restricted imports. During

coincident periods of hot weather, high output from Nanticoke and heavy flows into Ontario from New York at Niagara, the circuit sections into Burlington and Hamilton also congested generation and limited imports. Hydro One plans to relieve these thermal limitations and restore the circuits to their design maximums before summer 2006.

The Niagara expansion project will also expand the thermal capability of the QFW transmission path out of Beck by adding two 230kV circuits from Allanburg to Middleport, effectively adding two circuits to the QFW interface. This work is planned to be completed in the third quarter of 2006.

7.7 St. Lawrence to Hinchinbrooke

Summer 2005 operation exhibited very heavy loading on the 230 kV circuits westward from St. Lawrence TS to Hinchinbrooke TS. As two of the circuits share common towers, a tower fault would leave only one circuit to carry most of the power, and overload it beyond its limited time rating. These conditions prevailed during the heaviest demand days, and limited imports into Ontario from Quebec and New York, and required the use of emergency control actions including emergency transfer limits for some of these days. Relief of these limitations is a priority.

Uprating the circuits is highly desirable but likely not possible before next summer. IESO has requested Hydro One to explore the feasibility of enhancing the existing special protection system to allow for a reduction of generation in the event of a tower contingency, thereby relieving the limitation in the short-term. This is expected to provide sufficient relief for summer 2006, while more permanent solutions are explored.

7.8 Burlington Autotransformers

The loading on the four Burlington autotransformers continues to be very high and near their maximum ratings. A permanent failure of one transformer during summer peak loads would result in loadings that could exceed the 10-day rating of the remaining transformers, requiring load transfers or load interruptions. To minimize the risk of equipment failure and load interruptions, 2 per-unit overload protection should be installed on these transformers, and the lower rated pair should be replaced with higher rated units. Depending on load growth, the upgrade could be required as soon as summer 2006.

7.9 Additional Low Voltage Capacitors in the GTA

The high and growing demands experienced in summer 2005 continued to exhibit poor power factor, tending to lower voltage and increasing the need for reactive power from the generators in southern Ontario. Such a trend, if not corrected will require increasing amounts of reactive injection from the generating units, and leave insufficient spare reactive capability to control voltages following contingencies. Such a situation is unreliable and cannot be permitted to occur on the grid.

To correct this, and maintain sufficient spare reactive capability on the generators, IESO recommends that low voltage capacitor banks be installed, where possible, at Halton TS, Meadowvale TS, Palermo TS, Jim Yarrow TS, Cambridge-Preston TS, Whitby TS, and Otonabee TS. These additions would be helpful before summer 2006.

7.10 Porcupine TS Shunt Reactors

The recent 10-year outlook identified various enhancements for northeastern Ontario. Summer 2005 operation also reinforced the potential for high voltages at Porcupine and Pinard TS following 500 kV circuit contingencies. These voltages could exceed equipment capability and expose transmission customers to damaging high voltages. To reduce the risk to equipment, and reduce the exposure to customer interruptions, additional shunt reactors at Porcupine and/or Pinard TS may be required. These reactors must be included in the post-contingency switching capability of the north-east LGR scheme to effectively control voltages.

7.11 Great Lakes Power

Great Lakes Power will be completing a 230 kV transmission line between the northern part of their system near Wawa and the southern part near Sault St. Marie. The circuit will improve reliability to loads in the Sault St. Marie area and reduce restrictions to generation in the Great Lakes Power system.

7.12 Summary of Transmission Requirements for the Outlook Period

The following table summarizes the projects described above and various others that IESO has previously identified to maintain the reliability of the ICG, and that fall into this outlook period. Most of these projects have been identified in the IESO's recent 10-year outlook; additional details are available in that report. Others have been identified as a result of the summer 2005 experience, or from analysis since the publishing of the 10-year outlook, and their dates modified as a result.

Table 7.1 Transmission Projects Priorities

PROJECT PRIORITIES	*21st September 2005*	
Priority	***Description of Facilities***	***Expected Need Date***
1	Complete the on-going work at Cooksville TS to eliminate the need for a 230kV busbar at Lakeview SS	Spring-2006
2	Complete the 2nd Phase of the development of Parkway TS including the installation of a 2nd 500/230kV auto-transformer	
3	Complete the replacement of the 500kV and 115kV breakers at Porcupine TS, including the reconfiguration of the 500kV terminations and the related changes to the North-east SPS.	
4	Reconfigure the 115kV circuit terminations at Essex TS; Modify the Windsor Area SPS; & Reconductor 115kV circuits J3E & J4E	
5	Replace the two 215MVA 230/115kV auto-transformers at Burlington TS with higher-rated units. Install 2 pu over-current protection	
6	Install LV capacitor banks at Halton TS, Meadowvale TS, Palermo TS, Jim Yarrow TS, Cambridge-Preston TS, Whitby TS & Otonabee TS	
7	Uprate existing 230kV circuits into Burlington TS	
8	Install additional shunt reactors at Porcupine TS (& possibly at Pinard TS) and incorporate a post-contingency switching capability into the North-east LGR Scheme	
9	Enhance the Beauharnois-Saunders G/R Scheme to respond to double-circuit contingencies	
10	Uprate the 115kV circuits H9A & A2 between Hawthorne TS & Bilberry Creek TS	
11	Maintain a minimum of one 750MVA 500/230kV auto-transformer available as a system spare	
12	Reinforce the 230kV system between Allanburg TS & Middleport TS	Summer-2006
13	Replace the 230/115kV auto-transformers at Keith TS with higher-rated units	Fall-2006
14	Install two 250MVA 230/115kV auto-transformers at Cambridge-Preston TS	
15	Install shunt capacitors at Fort Frances TS or Mackenzie TS	
16	Install a 230/115kV auto-transformer at Kent TS	Spring-2007
17	Install a 245MVA 250kV capacitor bank at Detweiler TS	
18	Install a 245MVA 250kV capacitor bank at Orangeville TS	
19	Install two 412MVAr 250kV shunt capacitor banks at Middleport TS	Spring-2007
20	Install series capacitors at Nobel TS in the 500kV circuits X503E & X504E	

7.12 Planned Transmission Outages

A principal purpose of the transmission reliability assessment is to forecast any reduction in transmission capacity brought about by specific transmission outages. For a major transmission interface or interconnection, the reduction in transmission capacity due to an outage condition can be expressed as a change in the base flow limit associated with the interface or interconnection. Another purpose of the transmission reliability assessment is to identify the possibility of any security-related events on the IESO-controlled grid that could require contingency planning by market participants or by the IESO. As a result, the transmission outages are reviewed to identify transmission system reliability concerns and to highlight those outages that should be rescheduled or changed. As an example, a change to an outage may include reducing the scheduled duration or recall time.

The assessment of transmission outages will also identify any resources that are forecast to be constrained due to transmission outage conditions. The identification of a constrained resource is generally not reflected in the assessment of weekly resource adequacy, which is detailed in Section 3.1, since there is typically sufficient outage scheduling flexibility to avoid constraining off resources when such resources are needed for reliability. Transmitters and generators are expected to have a mutual interest in developing an ongoing arrangement to coordinate their outage planning activities. Transmission outages that may affect generation access to the IESO-controlled grid should be coordinated with the generator operators involved, especially at times when the forecast of reserve is deficient. Under the Market Rules, where the scheduling of planned outages by different market participant's conflicts such that both or all outages cannot be approved by the IESO, the IESO will inform the affected market participants and request that they resolve the conflict. If the conflict remains unresolved, the IESO shall determine which of the planned outages can be approved according to the priority of each planned outage as determined by the Market Rules detailed in Chapter 5, Sections 6.4.13 to 6.4.18.

For this Outlook, transmission outage plans submitted to the IESO's Integrated Outage Management System (IOMS) as of August 2005 were used. Since the previous 18-Month Outlook report, there have been some significant changes to the list of transmission outages that fit the reporting criteria.

The IESO's assessment of the impact of the transmission outage plans is shown in Appendix C, Tables C1 to C7. In these tables, each element is assessed individually by indicating the possible impacts and the reduction in transmission interface and/or interconnection limits. The methodology used to assess the transmission outage plans is described in the IESO document titled "Methodology to Perform Long Term Assessments" (IESO_REP_0266).

None of the transmission outages planned within the timeframe of this Outlook is judged to have a material impact on the overall reliability of the IESO-controlled grid.

The assessment of transmission outages for this Outlook has been limited to those outages with a scheduled duration of greater than five days or to those outages associated with a project where at least one outage has a scheduled duration of greater than five days. The IESO recognize that there are expected to be additional outage requirements and/or changes as time approaches the Outlook study period and that transmission capacity will be impacted by outages with a scheduled duration of five days or less. Prior to approving and releasing an outage, the IESO will reassess the outage for potential system impacts, taking into account all current and forecasted conditions.

It should be recognized that the large number of system changes identified to be completed in the 10-Year Outlook and this 18-Month assessment will require a substantial number of planned outages to incorporate the new facilities. It is too early in the development of most of these plans to identify specific outage requirements. These will be identified in future Outlooks.

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8.0 Overall Observations, Findings and Conclusions

The following findings and conclusions are based on the results of the assessment carried out for this Outlook.

Resource Adequacy

- Use of Emergency Control Actions was a very frequent occurrence this past summer. The repeated use of these emergency actions this past summer represented a sustained challenge to Ontario's reliability.
- Under the Existing Resource-Normal Weather Scenario, forecast reserves are generally adequate for the study period. Reserves are forecast to be above requirements for all but 12 weeks of the Outlook timeframe. During these weeks some planned generator outages are at risk of cancellation by the IESO for reliability purposes depending on their priority and the resource adequacy situation at the time their approval is being sought.
- Under the Planned Resource-Normal Weather Scenario, the resource adequacy situation is improved over the Existing Resource Scenario, mainly in the last nine months of the Outlook period. For all but three weeks of the Outlook timeframe, the forecast available resources exceed the planning requirements. To the extent this scenario materializes, opportunities will exist for additional planned generator maintenance and exports.
- Extreme weather during the peak periods will result in significantly increased reliance on imports to supplement Ontario generation.
- Results of the resource adequacy assessment are summarized in the matrix below. The different shadings are intended to suggest the degree of concern regarding the supply/demand situation under each resource-weather scenario combination.

	Normal Weather Scenario	Extreme Weather Scenario
Existing Resource Scenario	- opportunities for additional outages/exports exist in many weeks - there are 12 weeks when reserves are lower than required (planned outages at risk or imports potentially required)	- many planned outages at risk - imports required during some peak periods -higher risk of emergency operating procedures up to and including rotational load shedding
Planned Resource Scenario	- opportunities for additional outages/exports exist in most weeks - there are three weeks when reserves are lower than required (planned outages at risk or imports potentially required)	- some planned outages at risk - imports required during some peak periods -risk of requiring emergency operating procedures up to and including rotational load shedding

- The magnitude of resource deficiencies under extreme weather emphasizes the continued need for reliable supply and demand response within Ontario.
- For the 18 month period under study, the improved demand-supply situation for the Planned Resource Scenario is dependent on the additional generation and price-responsive demand coming into the market as forecast. Eight of the 10 new projects from the recent Request for Proposals for Renewable generation are expected to be available within the 18 month timeframe of this Outlook. The return to service of Ontario Power Generation's Pickering Unit 1 is scheduled for the fall of 2005.
- A number of large generating units are scheduled to return to service from outage prior to the summer 2006 and winter 2006/2007. Meeting these planned outage schedules is critical to maintaining adequate reserve levels.
- High generator unavailability, whether caused by higher forced outage rates or delays in returning generators to service, could lead to reliance on imports. Under these circumstances, opportunities for planned outages, especially during the peak summer period, would be limited.
- Over the 18 month period under study, the Northeast Power Coordinating Council resource adequacy criterion is expected to be met.
- Extreme weather during peak periods places increased emphasis on reliable Ontario resources and energy imported from neighbouring systems. To maximize the ability to respond to these peak period requirements the following actions are planned:

  Maximize the capability of existing resources:

  - Resolve generation dispatch issues (e.g. aggregation, frequency of dispatch)
  - Review the use of environmental variances within the list of emergency control actions

  Increase the certainty of market mechanisms:

  - Allow imports to be scheduled day ahead like all of the markets surrounding Ontario
  - Commit units day ahead like all of the markets surrounding Ontario
  - Implement an Emergency Demand Response Program like the markets surrounding Ontario

  IESO operations and planning:

  - Processes and criteria will be reviewed to ensure forecast risks are adequately recognized.

Transmission Adequacy

- The reactive capability of the Nanticoke, Pickering and Darlington units, in conjunction with new shunt capacitor banks are required to maintain adequate voltage levels in the Toronto zone during summer peak conditions. Installation of additional low voltage capacitor banks at various substations will be required to supplement reactive support from generators.
- The second phase of the Parkway Transformer Station will partially address the high loading of transmission facilities in the Greater Toronto Area in the short term. It is scheduled for completion by the beginning of summer 2006. However, additional transmission

reinforcement and local generation capability is urgently required to avert the need to use emergency control actions and the increased risk of load shedding within the GTA.

The need for additional supply in the west GTA has reached a critical point with a minimum of 600 MW of new supply required before summer of 2007. Contingency plans are being prepared by the IESO to manage and contain the consequences of the problem until new generation is available.

- In summer 2005, the IESO experienced limitations on the Queenston Flow West (QFW) interface under hot weather when demands exceeded 24,000 megawatts (MW) and Ontario was importing power. Onmany occasions this has limited import capability from New York. Improvements to transmission on the QFW interface are now expected to be completed by then end of the third quarter in 2006.
- Other limitations which need to be addressed are increasing the transfer capabilities in the Windsor area, northward into the Hamilton-Burlington area, and westward from St. Lawrence TS.
- Extreme weather during peak periods places increased emphasis on reliable Ontario resources and energy imported from neighbouring systems. To maximize the ability to respond to these peak period requirements The following actions are planned to improve the capability of the existing transmission system:
    - Make full use of phase shifters with Michigan to control parallel flows
    - Incremental additions to the transmission system to increase capabilities as described in the transmission adequacy section

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- End of Section -

Appendix A Resource Adequacy Assessment Details

Table A1 Assessment of Resource Adequacy: Existing Resource Scenario

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Above Requirement MW
02-Oct-05	30,116	6,099	360	24,377	22,423	23.3	4,608	13.4	2,654	1,954
09-Oct-05	30,116	6,311	360	24,165	22,488	22.2	4,391	13.7	2,714	1,677
16-Oct-05	30,116	7,275	360	23,201	22,786	15.3	3,071	13.2	2,656	415
23-Oct-05	30,116	6,703	360	23,773	23,218	15.9	3,264	13.2	2,709	555
30-Oct-05	30,116	6,640	360	23,836	23,809	13.9	2,913	13.8	2,886	27
06-Nov-05	30,116	5,671	360	24,805	24,532	15.3	3,286	14.0	3,013	273
13-Nov-05	30,116	5,271	360	25,205	24,784	15.6	3,404	13.7	2,983	421
20-Nov-05	30,116	5,033	360	25,443	25,461	13.4	2,998	13.4	3,016	-18
27-Nov-05	30,116	5,304	360	25,172	25,945	10.3	2,342	13.6	3,115	-773
04-Dec-05	30,116	4,726	360	25,750	26,064	12.3	2,812	13.6	3,126	-314
11-Dec-05	30,141	5,080	360	25,421	26,926	7.8	1,845	14.2	3,350	-1,505
18-Dec-05	30,141	3,560	360	26,941	27,041	14.0	3,311	14.4	3,411	-100
25-Dec-05	30,141	2,704	360	27,797	27,134	17.6	4,155	14.8	3,492	663
01-Jan-06	30,141	1,713	360	28,788	25,424	30.0	6,639	14.8	3,275	3,364
08-Jan-06	30,141	1,627	360	28,874	26,955	22.6	5,328	14.5	3,409	1,919
15-Jan-06	30,141	1,546	360	28,955	27,333	21.2	5,054	14.4	3,432	1,622
22-Jan-06	30,141	2,322	360	28,179	27,802	16.1	3,907	14.5	3,530	377
29-Jan-06	30,141	2,321	360	28,180	27,593	17.1	4,120	14.7	3,533	587
05-Feb-06	30,167	2,896	360	27,631	26,996	16.2	3,859	13.6	3,224	635
12-Feb-06	30,167	2,858	360	27,669	26,785	17.2	4,051	13.4	3,167	884
19-Feb-06	30,167	2,810	360	27,717	26,617	18.7	4,359	14.0	3,259	1,100
26-Feb-06	30,167	2,792	360	27,735	26,192	20.4	4,694	13.7	3,151	1,543
05-Mar-06	30,167	3,512	360	27,015	25,925	18.5	4,208	13.7	3,118	1,090
12-Mar-06	30,167	4,755	360	25,772	25,609	14.4	3,250	13.7	3,087	163
19-Mar-06	30,167	4,733	360	25,794	25,019	17.3	3,801	13.8	3,026	775
26-Mar-06	30,167	5,076	360	25,451	24,790	17.4	3,769	14.3	3,108	661
02-Apr-06	30,167	6,010	360	24,517	24,204	16.1	3,407	14.7	3,094	313
09-Apr-06	30,167	5,985	360	24,542	23,910	17.4	3,641	14.4	3,009	632
16-Apr-06	30,167	5,630	360	24,897	23,427	21.9	4,468	14.7	2,998	1,470
23-Apr-06	30,167	5,766	360	24,761	23,103	22.3	4,516	14.1	2,858	1,658
30-Apr-06	30,167	5,827	360	24,700	22,618	25.2	4,971	14.6	2,889	2,082
07-May-06	30,167	5,130	360	25,397	22,721	28.4	5,618	14.9	2,942	2,676
14-May-06	30,167	4,699	360	25,828	22,614	31.7	6,214	15.3	3,000	3,214
21-May-06	30,167	4,207	360	26,320	23,820	27.2	5,635	15.2	3,135	2,500
28-May-06	30,167	3,812	360	26,715	24,483	26.2	5,546	15.7	3,314	2,232
04-Jun-06	30,167	3,451	360	27,076	24,905	26.1	5,595	15.9	3,424	2,171
11-Jun-06	30,167	2,897	360	27,630	25,710	27.0	5,874	18.2	3,954	1,920
18-Jun-06	30,167	2,583	360	27,944	27,055	22.5	5,140	18.6	4,251	889
25-Jun-06	30,167	2,673	360	27,854	28,058	16.1	3,862	17.0	4,066	-204

Note: The reader should be aware that Security and Adequacy Assessments are published on the IESO web site on a weekly and daily basis that progressively supersede information presented in this report.

(Table A1 continued)

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Above Requirement MW
02-Jul-06	30,167	1,799	360	28,728	28,077	21.4	5,072	18.7	4,421	651
09-Jul-06	30,192	1,821	360	28,731	27,831	19.2	4,636	15.5	3,736	900
16-Jul-06	30,192	1,819	360	28,733	28,263	18.7	4,520	16.7	4,050	470
23-Jul-06	30,192	1,802	360	28,750	28,290	18.6	4,516	16.7	4,056	460
30-Jul-06	30,192	1,874	360	28,678	27,891	18.7	4,510	15.4	3,723	787
06-Aug-06	30,192	1,999	360	28,553	27,313	21.0	4,945	15.7	3,705	1,240
13-Aug-06	30,192	1,911	360	28,641	27,590	20.2	4,808	15.8	3,757	1,051
20-Aug-06	30,192	2,011	360	28,541	27,311	20.7	4,896	15.5	3,666	1,230
27-Aug-06	30,192	2,079	360	28,473	27,122	21.9	5,120	16.1	3,769	1,351
03-Sep-06	30,192	3,588	360	26,964	27,404	13.7	3,249	15.6	3,689	-440
10-Sep-06	30,192	3,681	360	26,871	26,627	18.5	4,203	17.5	3,959	244
17-Sep-06	30,192	5,303	360	25,249	25,833	13.3	2,971	16.0	3,555	-584
24-Sep-06	30,192	5,539	360	25,013	25,215	14.5	3,164	15.4	3,366	-202
01-Oct-06	30,192	5,881	360	24,671	22,818	22.7	4,570	13.5	2,717	1,853
08-Oct-06	30,192	5,783	360	24,769	22,943	23.6	4,724	14.5	2,898	1,826
15-Oct-06	30,192	5,796	360	24,756	23,251	21.5	4,374	14.1	2,869	1,505
22-Oct-06	30,192	5,631	360	24,921	23,646	19.9	4,141	13.8	2,866	1,275
29-Oct-06	30,192	5,600	360	24,952	24,114	17.8	3,763	13.8	2,925	838
05-Nov-06	30,218	5,984	360	24,594	24,824	12.8	2,799	13.9	3,029	-230
12-Nov-06	30,218	5,576	360	25,002	24,938	13.4	2,953	13.1	2,889	64
19-Nov-06	30,218	5,605	360	24,973	25,630	10.1	2,280	12.9	2,937	-657
26-Nov-06	30,218	5,496	360	25,082	26,200	8.7	2,004	13.5	3,122	-1,118
03-Dec-06	30,218	3,792	360	26,786	26,301	15.5	3,600	13.4	3,115	485
10-Dec-06	30,218	2,965	360	27,613	27,090	15.8	3,771	13.6	3,248	523
17-Dec-06	30,218	2,472	360	28,106	27,127	17.6	4,210	13.5	3,231	979
24-Dec-06	30,218	1,520	360	29,058	27,518	21.5	5,149	15.1	3,609	1,540
31-Dec-06	30,218	1,551	360	29,027	25,904	29.5	6,607	15.5	3,484	3,123
07-Jan-07	30,218	1,609	360	28,969	27,101	21.6	5,145	13.8	3,277	1,868
14-Jan-07	30,218	1,507	360	29,071	27,476	20.4	4,916	13.8	3,321	1,595
21-Jan-07	30,218	1,483	360	29,095	27,881	18.6	4,569	13.7	3,355	1,214
28-Jan-07	30,218	1,395	360	29,183	27,699	20.0	4,869	13.9	3,385	1,484
04-Feb-07	30,218	1,389	360	29,189	27,186	21.4	5,136	13.0	3,133	2,003
11-Feb-07	30,218	1,366	360	29,212	27,006	22.3	5,332	13.1	3,126	2,206
18-Feb-07	30,218	1,813	360	28,765	26,772	21.8	5,149	13.4	3,156	1,993
25-Feb-07	30,218	1,772	360	28,806	26,359	23.6	5,502	13.1	3,055	2,447
04-Mar-07	30,218	2,785	360	27,793	26,039	20.3	4,683	12.7	2,929	1,754
11-Mar-07	30,218	2,872	360	27,706	25,676	21.6	4,915	12.7	2,885	2,030
18-Mar-07	30,218	2,844	360	27,734	25,195	24.6	5,471	13.2	2,932	2,539
25-Mar-07	30,218	3,839	360	26,739	24,835	21.8	4,787	13.1	2,883	1,904
01-Apr-07	30,218	3,839	360	26,739	24,244	25.1	5,360	13.4	2,865	2,495

Table A2 Assessment of Resource Adequacy:
Planned Resource Scenario

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Above Requirement MW
02-Oct-05	30,116	6,099	365	24,382	22,423	23.3	4,613	13.4	2,654	1,959
09-Oct-05	30,116	6,311	383	24,188	22,488	22.3	4,414	13.7	2,714	1,700
16-Oct-05	30,116	7,275	383	23,224	22,786	15.4	3,094	13.2	2,656	438
23-Oct-05	30,631	6,703	383	24,311	23,191	18.5	3,802	13.1	2,682	1,120
30-Oct-05	30,631	6,640	383	24,374	23,753	16.5	3,451	13.5	2,830	621
06-Nov-05	30,631	5,671	383	25,343	24,491	17.8	3,824	13.8	2,972	852
13-Nov-05	30,631	5,271	383	25,743	24,750	18.1	3,942	13.5	2,949	993
20-Nov-05	30,631	5,033	383	25,981	25,400	15.8	3,536	13.2	2,955	581
27-Nov-05	30,631	5,304	383	25,710	25,890	12.6	2,880	13.4	3,060	-180
04-Dec-05	30,631	4,726	383	26,288	26,016	14.6	3,350	13.4	3,078	272
11-Dec-05	30,656	5,080	383	25,959	26,886	10.1	2,383	14.0	3,310	-927
18-Dec-05	30,773	3,560	410	27,623	26,978	16.9	3,993	14.2	3,348	645
25-Dec-05	30,773	2,704	410	28,479	27,174	20.5	4,837	14.9	3,532	1,305
01-Jan-06	30,773	1,713	410	29,470	25,472	33.1	7,321	15.0	3,323	3,998
08-Jan-06	30,813	1,663	410	29,560	26,999	25.5	6,014	14.7	3,453	2,561
15-Jan-06	30,813	1,582	410	29,641	27,376	24.0	5,740	14.5	3,475	2,265
22-Jan-06	30,813	2,358	410	28,865	27,780	18.9	4,593	14.5	3,508	1,085
29-Jan-06	30,813	2,357	410	28,866	27,599	20.0	4,806	14.7	3,539	1,267
05-Feb-06	30,907	2,999	410	28,318	26,971	19.1	4,546	13.5	3,199	1,347
12-Feb-06	30,907	2,954	410	28,363	26,791	20.1	4,745	13.4	3,173	1,572
19-Feb-06	30,907	2,907	410	28,410	26,658	21.6	5,052	14.1	3,300	1,752
26-Feb-06	30,907	2,889	410	28,428	26,235	23.4	5,387	13.9	3,194	2,193
05-Mar-06	30,907	3,609	410	27,708	25,970	21.5	4,901	13.9	3,163	1,738
12-Mar-06	30,907	4,852	410	26,465	25,552	17.5	3,943	13.5	3,030	913
19-Mar-06	30,907	4,829	410	26,488	25,037	20.4	4,495	13.8	3,044	1,451
26-Mar-06	30,907	5,173	410	26,144	24,810	20.6	4,462	14.4	3,128	1,334
02-Apr-06	31,006	6,205	427	25,227	24,193	19.5	4,117	14.6	3,083	1,034
09-Apr-06	31,006	6,161	427	25,271	23,933	20.9	4,370	14.5	3,032	1,338
16-Apr-06	31,006	5,806	427	25,626	23,470	25.4	5,197	14.9	3,041	2,156
23-Apr-06	31,006	5,942	427	25,490	23,150	25.9	5,245	14.4	2,905	2,340
30-Apr-06	31,006	6,526	427	24,906	22,630	26.2	5,177	14.7	2,901	2,276
07-May-06	31,006	5,830	427	25,602	22,734	29.4	5,823	14.9	2,955	2,868
14-May-06	31,006	5,400	427	26,032	22,627	32.7	6,418	15.4	3,013	3,405
21-May-06	31,006	4,383	427	27,049	23,863	30.8	6,364	15.4	3,178	3,186
28-May-06	31,006	3,988	427	27,444	24,526	29.6	6,275	15.9	3,357	2,918
04-Jun-06	31,006	3,627	428	27,806	24,945	29.4	6,325	16.1	3,464	2,861
11-Jun-06	31,006	3,073	428	28,360	25,754	30.4	6,604	18.4	3,998	2,606
18-Jun-06	31,006	2,759	428	28,674	27,102	25.7	5,870	18.9	4,298	1,572
25-Jun-06	31,006	2,849	428	28,584	28,025	19.1	4,592	16.8	4,033	559

Note: The reader should be aware that Security and Adequacy Assessments are published on the IESO web site on a weekly and daily basis that progressively supersede information presented in this report.

(Table A2 continued)

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Above Requirement MW
02-Jul-06	31,006	1,975	428	29,458	28,108	24.5	5,802	18.8	4,452	1,350
09-Jul-06	31,031	2,007	428	29,451	27,878	22.2	5,356	15.7	3,783	1,573
16-Jul-06	31,031	2,005	428	29,453	28,311	21.6	5,240	16.9	4,098	1,142
23-Jul-06	31,031	1,988	428	29,470	28,338	21.6	5,236	16.9	4,104	1,132
30-Jul-06	31,031	2,060	428	29,398	27,938	21.6	5,230	15.6	3,770	1,460
06-Aug-06	31,031	2,184	428	29,274	27,361	24.0	5,666	15.9	3,753	1,913
13-Aug-06	31,031	2,096	428	29,362	27,637	23.2	5,529	16.0	3,804	1,725
20-Aug-06	31,031	2,197	428	29,261	27,359	23.8	5,616	15.7	3,714	1,902
27-Aug-06	31,031	2,265	428	29,193	27,168	25.0	5,840	16.3	3,815	2,025
03-Sep-06	31,130	3,873	428	27,684	27,361	16.7	3,969	15.4	3,646	323
10-Sep-06	31,130	3,966	428	27,591	26,665	21.7	4,923	17.6	3,997	926
17-Sep-06	31,130	5,588	428	25,969	25,777	16.6	3,691	15.7	3,499	192
24-Sep-06	31,130	5,824	428	25,733	25,187	17.8	3,884	15.3	3,338	546
01-Oct-06	31,130	6,166	428	25,391	22,865	26.3	5,290	13.8	2,764	2,526
08-Oct-06	31,130	6,063	428	25,494	22,992	27.2	5,449	14.7	2,947	2,502
15-Oct-06	31,130	6,076	428	25,481	23,296	25.0	5,099	14.3	2,914	2,185
22-Oct-06	31,130	6,425	428	25,132	23,658	20.9	4,352	13.9	2,878	1,474
29-Oct-06	31,130	6,395	428	25,162	24,126	18.8	3,973	13.9	2,937	1,036
05-Nov-06	31,156	6,263	428	25,320	24,755	16.2	3,525	13.6	2,960	565
12-Nov-06	31,156	5,856	428	25,727	24,868	16.7	3,678	12.8	2,819	859
19-Nov-06	31,156	5,875	428	25,708	25,558	13.3	3,015	12.6	2,865	150
26-Nov-06	31,156	5,776	428	25,807	26,130	11.8	2,729	13.2	3,052	-323
03-Dec-06	31,156	4,062	428	27,521	26,252	18.7	4,335	13.2	3,066	1,269
10-Dec-06	31,156	3,245	428	28,338	27,049	18.9	4,496	13.5	3,207	1,289
17-Dec-06	31,156	2,752	428	28,831	27,153	20.7	4,935	13.6	3,257	1,678
24-Dec-06	31,156	1,799	428	29,784	27,563	24.6	5,875	15.3	3,654	2,221
31-Dec-06	31,156	1,831	428	29,752	25,950	32.7	7,332	15.7	3,530	3,802
07-Jan-07	31,156	1,889	428	29,694	27,142	24.6	5,870	13.9	3,318	2,552
14-Jan-07	31,156	1,787	428	29,796	27,523	23.4	5,641	13.9	3,368	2,273
21-Jan-07	31,156	1,763	428	29,820	27,929	21.6	5,294	13.9	3,403	1,891
28-Jan-07	31,156	1,674	428	29,909	27,747	23.0	5,595	14.1	3,433	2,162
04-Feb-07	31,156	1,669	428	29,914	27,231	24.4	5,861	13.2	3,178	2,683
11-Feb-07	31,156	1,645	428	29,938	27,052	25.4	6,058	13.3	3,172	2,886
18-Feb-07	31,156	2,093	428	29,490	26,820	24.9	5,874	13.6	3,204	2,670
25-Feb-07	31,156	2,052	428	29,531	26,404	26.7	6,227	13.3	3,100	3,127
04-Mar-07	31,156	3,055	428	28,528	26,088	23.4	5,418	12.9	2,978	2,440
11-Mar-07	31,156	3,152	428	28,431	25,724	24.8	5,640	12.9	2,933	2,707
18-Mar-07	31,156	3,120	428	28,463	25,243	27.9	6,200	13.4	2,980	3,220
25-Mar-07	31,156	4,109	428	27,474	24,884	25.2	5,522	13.4	2,932	2,590
01-Apr-07	31,156	4,109	428	27,474	24,293	28.5	6,095	13.6	2,914	3,181

Table A3 Demand Forecast Range For Required Resources Calculation

Week Ending Day	Ontario Demand Normal Weather MW	Ontario Demand Extreme Weather MW
02-Oct-05	19769	23343
09-Oct-05	19774	23686
16-Oct-05	20130	20792
23-Oct-05	20509	21430
30-Oct-05	20923	21671
06-Nov-05	21519	22203
13-Nov-05	21801	22544
20-Nov-05	22445	23372
27-Nov-05	22830	23898
04-Dec-05	22938	24409
11-Dec-05	23576	25241
18-Dec-05	23630	24844
25-Dec-05	23642	25691
01-Jan-06	22149	23385
08-Jan-06	23546	25389
15-Jan-06	23901	25791
22-Jan-06	24272	25426
29-Jan-06	24060	25474
05-Feb-06	23772	25363
12-Feb-06	23618	24936
19-Feb-06	23358	24912
26-Feb-06	23041	24178
05-Mar-06	22807	24275
12-Mar-06	22522	24087
19-Mar-06	21993	23405
26-Mar-06	21682	22932
02-Apr-06	21110	22310
09-Apr-06	20901	22387
16-Apr-06	20429	21597
23-Apr-06	20245	21095
30-Apr-06	19729	20752
07-May-06	19779	20617
14-May-06	19614	23560
21-May-06	20685	23186
28-May-06	21169	23860
04-Jun-06	21481	24649
11-Jun-06	21756	25633
18-Jun-06	22804	26586
25-Jun-06	23992	26451

(Table A3 continued)

Week Ending Day	Ontario Demand Normal Weather MW	Ontario Demand Extreme Weather MW
02-Jul-06	23656	26493
09-Jul-06	24095	27057
16-Jul-06	24213	27378
23-Jul-06	24234	26585
30-Jul-06	24168	26156
06-Aug-06	23608	26551
13-Aug-06	23833	26685
20-Aug-06	23645	26221
27-Aug-06	23353	25852
03-Sep-06	23715	26773
10-Sep-06	22668	25970
17-Sep-06	22278	25762
24-Sep-06	21849	25050
01-Oct-06	20101	23735
08-Oct-06	20045	24041
15-Oct-06	20382	21044
22-Oct-06	20780	21692
29-Oct-06	21189	21942
05-Nov-06	21795	22492
12-Nov-06	22049	22821
19-Nov-06	22693	23617
26-Nov-06	23078	24170
03-Dec-06	23186	24658
10-Dec-06	23842	25508
17-Dec-06	23896	25115
24-Dec-06	23909	25962
31-Dec-06	22420	23790
07-Jan-07	23824	25667
14-Jan-07	24155	26069
21-Jan-07	24526	25680
28-Jan-07	24314	25736
04-Feb-07	24053	25621
11-Feb-07	23880	25198
18-Feb-07	23616	25170
25-Feb-07	23304	24444
04-Mar-07	23110	24544
11-Mar-07	22791	24355
18-Mar-07	22263	23693
25-Mar-07	21952	23201
01-Apr-07	21379	22579

Table A4 Assessment of Resource Adequacy: Extreme Weather, Existing Resource Scenario

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Above Requirement MW
02-Oct-05	30,116	6,099	360	24,377	26,405	4.4	1,034	13.1	3,062	-2,028
09-Oct-05	30,116	6,311	360	24,165	26,887	2.0	479	13.5	3,201	-2,722
16-Oct-05	30,116	7,210	360	23,266	23,464	11.9	2,474	12.9	2,672	-198
23-Oct-05	30,116	6,681	360	23,795	24,217	11.0	2,365	13.0	2,787	-422
30-Oct-05	30,116	6,555	360	23,921	24,510	10.4	2,250	13.1	2,839	-589
06-Nov-05	30,116	5,625	360	24,851	25,150	11.9	2,648	13.3	2,947	-299
13-Nov-05	30,116	5,216	360	25,260	25,504	12.1	2,716	13.1	2,960	-244
20-Nov-05	30,116	4,999	360	25,477	26,481	9.0	2,105	13.3	3,109	-1,004
27-Nov-05	30,116	5,286	360	25,190	27,019	5.4	1,292	13.1	3,121	-1,829
04-Dec-05	30,116	4,681	360	25,795	27,649	5.7	1,386	13.3	3,240	-1,854
11-Dec-05	30,141	5,034	360	25,467	28,649	0.9	226	13.5	3,408	-3,182
18-Dec-05	30,141	3,529	360	26,972	28,214	8.6	2,128	13.6	3,370	-1,242
25-Dec-05	30,141	2,583	360	27,918	29,108	8.7	2,227	13.3	3,417	-1,190
01-Jan-06	30,141	1,668	360	28,833	26,413	23.3	5,448	13.0	3,028	2,420
08-Jan-06	30,141	1,619	360	28,882	28,552	13.8	3,493	12.5	3,163	330
15-Jan-06	30,141	1,467	360	29,034	29,036	12.6	3,243	12.6	3,245	-2
22-Jan-06	30,141	2,296	360	28,205	28,715	10.9	2,779	12.9	3,289	-510
29-Jan-06	30,141	2,321	360	28,180	28,776	10.6	2,706	13.0	3,302	-596
05-Feb-06	30,167	2,896	360	27,631	28,602	8.9	2,268	12.8	3,239	-971
12-Feb-06	30,167	2,858	360	27,669	28,086	11.0	2,733	12.6	3,150	-417
19-Feb-06	30,167	2,810	360	27,717	28,049	11.3	2,805	12.6	3,137	-332
26-Feb-06	30,167	2,792	360	27,735	27,191	14.7	3,557	12.5	3,013	544
05-Mar-06	30,167	3,512	360	27,015	27,273	11.3	2,740	12.4	2,998	-258
12-Mar-06	30,167	4,755	360	25,772	27,174	7.0	1,685	12.8	3,087	-1,402
19-Mar-06	30,167	4,733	360	25,794	26,392	10.2	2,389	12.8	2,987	-598
26-Mar-06	30,167	5,076	360	25,451	25,936	11.0	2,519	13.1	3,004	-485
02-Apr-06	30,167	6,010	360	24,517	25,319	9.9	2,207	13.5	3,009	-802
09-Apr-06	30,167	5,985	360	24,542	25,412	9.6	2,155	13.5	3,025	-870
16-Apr-06	30,167	5,630	360	24,897	24,389	15.3	3,300	12.9	2,792	508
23-Apr-06	30,167	5,766	360	24,761	23,802	17.4	3,666	12.8	2,707	959
30-Apr-06	30,167	5,827	360	24,700	23,439	19.0	3,948	13.0	2,687	1,261
07-May-06	30,167	5,127	360	25,400	23,392	23.2	4,783	13.5	2,775	2,008
14-May-06	30,167	4,709	360	25,818	26,791	9.6	2,258	13.7	3,231	-973
21-May-06	30,167	4,207	360	26,320	26,148	13.5	3,134	12.8	2,962	172
28-May-06	30,167	3,873	360	26,654	27,014	11.7	2,794	13.2	3,154	-360
04-Jun-06	30,167	3,451	360	27,076	27,988	9.9	2,427	13.6	3,339	-912
11-Jun-06	30,167	2,897	360	27,630	29,183	7.8	1,997	13.9	3,550	-1,553
18-Jun-06	30,167	2,583	360	27,944	30,355	5.1	1,358	14.2	3,769	-2,411
25-Jun-06	30,167	2,673	360	27,854	30,208	5.3	1,403	14.2	3,757	-2,354

(Table A4 continued)

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Above Requirement MW
02-Jul-06	30,167	1,799	360	28,728	29,905	8.4	2,235	12.9	3,412	-1,177
09-Jul-06	30,192	1,812	360	28,740	30,546	6.2	1,683	12.9	3,489	-1,806
16-Jul-06	30,192	1,812	360	28,740	30,917	5.0	1,362	12.9	3,539	-2,177
23-Jul-06	30,192	1,773	360	28,779	29,982	8.3	2,194	12.8	3,397	-1,203
30-Jul-06	30,192	1,870	360	28,682	29,476	9.7	2,526	12.7	3,320	-794
06-Aug-06	30,192	1,898	360	28,654	29,956	7.9	2,103	12.8	3,405	-1,302
13-Aug-06	30,192	1,931	360	28,621	30,093	7.3	1,936	12.8	3,408	-1,472
20-Aug-06	30,192	2,032	360	28,520	29,557	8.8	2,299	12.7	3,336	-1,037
27-Aug-06	30,192	2,043	360	28,509	29,145	10.3	2,657	12.7	3,293	-636
03-Sep-06	30,192	3,453	360	27,099	30,182	1.2	326	12.7	3,409	-3,083
10-Sep-06	30,192	3,518	360	27,034	29,230	4.1	1,064	12.6	3,260	-2,196
17-Sep-06	30,192	5,075	360	25,477	29,129	-1.1	-285	13.1	3,367	-3,652
24-Sep-06	30,192	5,403	360	25,149	28,225	0.4	99	12.7	3,175	-3,076
01-Oct-06	30,192	5,800	360	24,752	26,844	4.3	1,017	13.1	3,109	-2,092
08-Oct-06	30,192	5,635	360	24,917	27,363	3.6	876	13.8	3,322	-2,446
15-Oct-06	30,192	5,713	360	24,839	23,791	18.0	3,795	13.1	2,747	1,048
22-Oct-06	30,192	5,533	360	25,019	24,526	15.3	3,327	13.1	2,834	493
29-Oct-06	30,192	5,559	360	24,993	24,825	13.9	3,051	13.1	2,883	168
05-Nov-06	30,218	5,857	360	24,721	25,452	9.9	2,229	13.2	2,960	-731
12-Nov-06	30,218	5,506	360	25,072	25,689	9.9	2,251	12.6	2,868	-617
19-Nov-06	30,218	5,605	360	24,973	26,667	5.7	1,356	12.9	3,050	-1,694
26-Nov-06	30,218	5,466	360	25,112	27,275	3.9	942	12.9	3,105	-2,163
03-Dec-06	30,218	3,792	360	26,786	27,867	8.6	2,128	13.0	3,209	-1,081
10-Dec-06	30,218	2,941	360	27,637	28,793	8.4	2,129	12.9	3,285	-1,156
17-Dec-06	30,218	2,426	360	28,152	28,286	12.1	3,037	12.6	3,171	-134
24-Dec-06	30,218	1,416	360	29,162	29,374	12.3	3,200	13.1	3,412	-212
31-Dec-06	30,218	1,451	360	29,127	26,921	22.4	5,337	13.2	3,131	2,206
07-Jan-07	30,218	1,597	360	28,981	28,712	12.9	3,314	11.9	3,045	269
14-Jan-07	30,218	1,432	360	29,146	29,180	11.8	3,077	11.9	3,111	-34
21-Jan-07	30,218	1,357	360	29,221	28,726	13.8	3,541	11.9	3,046	495
28-Jan-07	30,218	1,349	360	29,229	28,787	13.6	3,493	11.9	3,051	442
04-Feb-07	30,218	1,333	360	29,245	28,660	14.1	3,624	11.9	3,039	585
11-Feb-07	30,218	1,258	360	29,320	28,142	16.4	4,122	11.7	2,944	1,178
18-Feb-07	30,218	1,760	360	28,818	28,105	14.5	3,648	11.7	2,935	713
25-Feb-07	30,218	1,749	360	28,829	27,213	17.9	4,385	11.3	2,769	1,616
04-Mar-07	30,218	2,778	360	27,800	27,308	13.3	3,256	11.3	2,764	492
11-Mar-07	30,218	2,822	360	27,756	27,117	14.0	3,401	11.3	2,762	639
18-Mar-07	30,218	2,822	360	27,756	26,294	17.2	4,063	11.0	2,601	1,462
25-Mar-07	30,218	3,839	360	26,739	25,833	15.3	3,538	11.3	2,632	906
01-Apr-07	30,218	3,839	360	26,739	25,103	18.4	4,160	11.2	2,524	1,636

Table A5 Assessment of Resource Adequacy: Extreme Weather, Planned Resource Scenario

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Above Requirement MW
02-Oct-05	30,116	6,099	365	24,382	26,405	4.5	1,039	13.1	3,062	-2,023
09-Oct-05	30,116	6,311	383	24,188	26,887	2.1	502	13.5	3,201	-2,699
16-Oct-05	30,116	7,210	383	23,289	23,464	12.0	2,497	12.9	2,672	-175
23-Oct-05	30,631	6,681	383	24,333	24,177	13.6	2,903	12.8	2,747	156
30-Oct-05	30,631	6,555	383	24,459	24,465	12.9	2,788	12.9	2,794	-6
06-Nov-05	30,631	5,625	383	25,389	25,113	14.4	3,186	13.1	2,910	276
13-Nov-05	30,631	5,216	383	25,798	25,464	14.4	3,254	13.0	2,920	334
20-Nov-05	30,631	4,999	383	26,015	26,433	11.3	2,643	13.1	3,061	-418
27-Nov-05	30,631	5,286	383	25,728	26,970	7.7	1,830	12.9	3,072	-1,242
04-Dec-05	30,631	4,681	383	26,333	27,576	7.9	1,924	13.0	3,167	-1,243
11-Dec-05	30,656	5,034	383	26,005	28,609	3.0	764	13.3	3,368	-2,604
18-Dec-05	30,773	3,646	410	27,537	28,171	10.8	2,693	13.4	3,327	-634
25-Dec-05	30,773	2,700	410	28,483	29,072	10.9	2,792	13.2	3,381	-589
01-Jan-06	30,773	1,785	410	29,398	26,441	25.7	6,013	13.1	3,056	2,957
08-Jan-06	30,813	1,772	410	29,451	28,484	16.0	4,062	12.2	3,095	967
15-Jan-06	30,813	1,620	410	29,603	28,994	14.8	3,812	12.4	3,203	609
22-Jan-06	30,813	2,449	410	28,774	28,635	13.2	3,348	12.6	3,209	139
29-Jan-06	30,813	2,474	410	28,749	28,696	12.9	3,275	12.7	3,222	53
05-Feb-06	30,907	3,116	410	28,201	28,559	11.2	2,838	12.6	3,196	-358
12-Feb-06	30,907	3,071	410	28,246	28,027	13.3	3,310	12.4	3,091	219
19-Feb-06	30,907	3,024	410	28,293	27,996	13.6	3,381	12.4	3,084	297
26-Feb-06	30,907	3,006	410	28,311	27,131	17.1	4,133	12.2	2,953	1,180
05-Mar-06	30,907	3,726	410	27,591	27,224	13.7	3,316	12.2	2,949	367
12-Mar-06	30,907	4,969	410	26,348	27,134	9.4	2,261	12.7	3,047	-786
19-Mar-06	30,907	4,946	410	26,371	26,329	12.7	2,966	12.5	2,924	42
26-Mar-06	30,907	5,290	410	26,027	25,898	13.5	3,095	12.9	2,966	129
02-Apr-06	31,006	6,322	427	25,110	25,271	12.6	2,800	13.3	2,961	-161
09-Apr-06	31,006	6,278	427	25,154	25,357	12.4	2,767	13.3	2,970	-203
16-Apr-06	31,006	5,923	427	25,509	24,332	18.1	3,912	12.7	2,735	1,177
23-Apr-06	31,006	6,059	427	25,373	23,811	20.3	4,278	12.9	2,716	1,562
30-Apr-06	31,006	6,635	427	24,797	23,439	19.5	4,045	13.0	2,687	1,358
07-May-06	31,006	5,945	427	25,487	23,392	23.6	4,870	13.5	2,775	2,095
14-May-06	31,006	5,527	427	25,905	26,787	10.0	2,345	13.7	3,227	-882
21-May-06	31,006	4,500	427	26,932	26,073	16.2	3,746	12.5	2,887	859
28-May-06	31,006	4,176	427	27,256	26,969	14.2	3,396	13.0	3,109	287
04-Jun-06	31,006	3,744	428	27,689	27,910	12.3	3,040	13.2	3,261	-221
11-Jun-06	31,006	3,190	428	28,243	29,143	10.2	2,610	13.7	3,510	-900
18-Jun-06	31,006	2,876	428	28,557	30,305	7.4	1,971	14.0	3,719	-1,748
25-Jun-06	31,006	2,966	428	28,467	30,162	7.6	2,016	14.0	3,711	-1,695

(Table A5 continued)

Week Ending Day	Total Resources MW	Total Reductions in Resources MW	Price-responsive Demand MW	Available Resources MW	Required Resources MW	Available Reserve %	Available Reserve MW	Required Reserve %	Required Reserve MW	Reserve Above Requirement MW
02-Jul-06	31,006	2,092	428	29,341	29,858	10.8	2,848	12.7	3,365	-517
09-Jul-06	31,031	2,105	428	29,353	30,505	8.5	2,296	12.7	3,448	-1,152
16-Jul-06	31,031	2,105	428	29,353	30,879	7.2	1,975	12.8	3,501	-1,526
23-Jul-06	31,031	2,076	428	29,382	29,937	10.5	2,797	12.6	3,352	-555
30-Jul-06	31,031	2,173	428	29,285	29,404	12.0	3,129	12.4	3,248	-119
06-Aug-06	31,031	2,201	428	29,257	29,907	10.2	2,706	12.6	3,356	-650
13-Aug-06	31,031	2,234	428	29,224	30,043	9.5	2,539	12.6	3,358	-819
20-Aug-06	31,031	2,335	428	29,123	29,498	11.1	2,902	12.5	3,277	-375
27-Aug-06	31,031	2,346	428	29,112	29,067	12.6	3,260	12.4	3,215	45
03-Sep-06	31,130	3,855	428	27,702	30,133	3.5	929	12.6	3,360	-2,431
10-Sep-06	31,130	3,920	428	27,637	29,186	6.4	1,667	12.4	3,216	-1,549
17-Sep-06	31,130	5,477	428	26,080	29,051	1.2	318	12.8	3,289	-2,971
24-Sep-06	31,130	5,805	428	25,752	28,173	2.8	702	12.5	3,123	-2,421
01-Oct-06	31,130	6,202	428	25,355	26,794	6.8	1,620	12.9	3,059	-1,439
08-Oct-06	31,130	6,031	428	25,526	27,314	6.2	1,485	13.6	3,273	-1,788
15-Oct-06	31,130	6,110	428	25,447	23,833	20.9	4,403	13.3	2,789	1,614
22-Oct-06	31,130	6,445	428	25,112	24,521	15.8	3,420	13.0	2,829	591
29-Oct-06	31,130	6,471	428	25,086	24,814	14.3	3,144	13.1	2,872	272
05-Nov-06	31,156	6,254	428	25,329	25,395	12.6	2,837	12.9	2,903	-66
12-Nov-06	31,156	5,903	428	25,680	25,617	12.5	2,859	12.3	2,796	63
19-Nov-06	31,156	5,992	428	25,591	26,617	8.4	1,974	12.7	3,000	-1,026
26-Nov-06	31,156	5,863	428	25,720	27,239	6.4	1,550	12.7	3,069	-1,519
03-Dec-06	31,156	4,179	428	27,404	27,817	11.1	2,746	12.8	3,159	-413
10-Dec-06	31,156	3,328	428	28,255	28,743	10.8	2,747	12.7	3,235	-488
17-Dec-06	31,156	2,813	428	28,770	28,233	14.6	3,655	12.4	3,118	537
24-Dec-06	31,156	1,812	428	29,771	29,331	14.7	3,809	13.0	3,369	440
31-Dec-06	31,156	1,848	428	29,735	26,960	25.0	5,945	13.3	3,170	2,775
07-Jan-07	31,156	1,994	428	29,589	28,658	15.3	3,922	11.7	2,991	931
14-Jan-07	31,156	1,829	428	29,754	29,135	14.1	3,685	11.8	3,066	619
21-Jan-07	31,156	1,754	428	29,829	28,673	16.2	4,149	11.7	2,993	1,156
28-Jan-07	31,156	1,746	428	29,837	28,739	15.9	4,101	11.7	3,003	1,098
04-Feb-07	31,156	1,730	428	29,853	28,603	16.5	4,232	11.6	2,982	1,250
11-Feb-07	31,156	1,645	428	29,938	28,102	18.8	4,740	11.5	2,904	1,836
18-Feb-07	31,156	2,157	428	29,426	28,032	16.9	4,256	11.4	2,862	1,394
25-Feb-07	31,156	2,146	428	29,437	27,237	20.4	4,993	11.4	2,793	2,200
04-Mar-07	31,156	3,165	428	28,418	27,250	15.8	3,874	11.0	2,706	1,168
11-Mar-07	31,156	3,209	428	28,374	27,036	16.5	4,019	11.0	2,681	1,338
18-Mar-07	31,156	3,209	428	28,374	26,286	19.8	4,681	10.9	2,593	2,088
25-Mar-07	31,156	4,226	428	27,357	25,773	17.9	4,156	11.1	2,572	1,584
01-Apr-07	31,156	4,226	428	27,357	25,129	21.2	4,778	11.3	2,550	2,228

Table A6 Energy Production Capability Forecast

Month	Existing Resource Scenario Forecast Energy Production Capability (GWh)	Planned Resource Scenario Forecast Energy Production Capability (GWh)
Oct 2005	14,315	14,479
Nov 2005	14,453	14,806
Dec 2005	16,558	16,922
Jan 2006	17,017	17,370
Feb 2006	14,918	15,237
Mar 2006	15,363	15,716
Apr 2006	13,738	14,079
May 2006	15,467	15,819
Jun 2006	15,916	16,257
Jul 2006	17,347	17,700
Aug 2006	17,166	17,518
Sep 2006	14,528	14,869
Oct 2006	14,395	14,747
Nov 2006	14,243	14,584
Dec 2006	17,333	17,686
Jan 2007	17,860	18,228
Feb 2007	16,079	16,411
Mar 2007	17,861	18,228

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Appendix B Transmission Projects

Zone	CAA-ID#	Description	Proposed I/S Date
East	2002-072	Belle River East DS	2006-Q2
East	2004-161	Cornwall 115KV Transmission	2006-Q2
Essa	2004-135	Essa Shunt Capacitor	2006-Q2
Niagara	2002-085	Queenston Flow West	2006-Q3
Northeast	2004-EX210	Hollingsworth TS - 115/12 kV transformer (T1) replaced with new 28 MVA transformer	2005-Q4
Northeast	2004-EX208	New 115 kV tie breaker at Third Line TS between CB 445 & CB 455	2005-Q4
Northeast	2002-070	K24G - 230 kV line between Third Line TS and MacKay TS	2005-Q4
Northeast	2002-070	W23K - 230 kV line between MacKay TS and Wawa TS	2005-Q4
Northeast	2002-070	New MacKay TS 230 kV switchyard with 3 x breaker ring-bus, 230/115 kV 200 MVA autotransformers & 40 MVAr reactor	2005-Q4
Northeast	2002-070	New Third Line TS 230 kVswitchyard with 5 x breaker ring-bus	2005-Q4
Northeast	2004-EX211	Patrick St. TS - 8 oil circuit breakers replaced with SF6 breakers	2006-Q3
Northeast	2003-Ex173	New Gartshore TS - 5x115 kV breaker ring-bus to replace existing Gartshore TS	2006-Q4
Northeast	2002-070	P21G 230 kV cct Upgraded to 374 MVA continuous rating	2006-Q4
Toronto	2004-113	Cooksville TS reconfigure connections from Applewood Junction	2006-Q2
Toronto	2003-099	Parkway TS - Completion of second auto-transformer and the remaining work for project 2003-099	2006-Q2

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Appendix C Planned Transmission Outages

The following tables list the planned transmission outages by transmission zone, for transmission outages with an expected duration greater than five days, and/or for those transmission outages associated with a major project.

Table C1 East Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
Apr 21 2006 10:45 PM	May 13 2006 10:59 PM	Cardinal Power CGS: T1H, T1, T1H-H	CWW	Non-Recallable	None	

Table C2 Essa Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
Sep 26 2005 5:00 AM	Oct 02 2005 6:00 PM	Parry Sound TS: T2Y, 77T2-E26, T2	CWW	Non-Recallable	None	
Oct 10 2005 5:00 AM	Oct 16 2005 6:00 PM	Waubaushene TS: T6, 98-E26, T6Q	CWW	Non-Recallable	None	
Oct 03 2005 5:00 AM	Oct 09 2005 6:00 PM	Waubaushene TS: T5, 98-E27, T5J	CWW	Non-Recallable	None	

Table C3 Niagara Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
Dec 31 2003 11:00 PM	Dec 31 2005 6:00 PM	Beck #2 TS: R76-S	CWW	Non-Recallable	None	
Oct 03 2005 7:00 AM	Oct 31 2005 6:00 PM	Carlton TS: T2-A, T2H, T2B, T2	CWW	7 Day	None	

Table C4 Northeast Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
Aug 29 2005 12:00 PM	Sep 30 2005 12:00 PM	Wawa TS: T2, T2-K, T2R2, T2SC2, T2-H, SS2-T2	CWW	4 Day	None	
Feb 26 2005 11:30 AM	Dec 31 2005 11:59 PM	Mackay TS: SAULT#1::MACKAY_TS::BATCHEWANA, SAULT#1::MACKAY_TS::BATCHEWANA, 591	CWW	Non-Recallable	None	
Feb 26 2005 7:00 PM	Dec 31 2005 11:59 PM	Third Line TS: #2-SAULT-LINE::MACKAY_TS::THIRD_LINE_TS, #2-SAULT-LINE::MACKAY_TS::THIRD_LINE_TS, 592	CWW	Non-Recallable	None	
Apr 10 2006 8:00 AM	Apr 17 2006 6:00 PM	Echo River CTS: P22G::ECHO_RIVER_CTS::MISSISSAGI_TS, 34-P22G, P22G::ECHO_RIVER_CTS::MISSISSAGI_TS	CWW	Non-Recallable	None	
Apr 24 2006 8:00 AM	May 01 2006 6:00 PM	Mississagi TS: P21G::MISSISSAGI_TS::P21G_P8_JCT, 34-P21G, P21G::P21G_P8_JCT::THIRD_LINE_CTS, P21G::MISSISSAGI_TS::P21G_P8_JCT, P21G::P21G_P8_JCT::THIRD_LINE_CTS	CWW	4 Day	None	
May 03 2005 8:00 AM	Sep 30 2005 11:59 PM	Inco #4 CTS: T1	CWW	Non-Recallable	None	
May 25 2005 5:00 AM	Dec 31 2005 11:59 PM	Goulais Bay: 581	CWW	Non-Recallable	None	
May 26 2005 7:45 AM	Dec 31 2005 11:59 PM	Third Line TS: SAULT#1::THIRD_LINE_TS::BATCHEWANA, SAULT#1::THIRD_LINE_TS::BATCHEWANA	CWW	Non-Recallable	None	
Apr 24 2006 5:30 PM	May 01 2006 5:00 PM	P21G P8 JCT: P21G::MISSISSAGI_TS::P21G_P8_JCT, P21G::P21G_P8_JCT::THIRD_LINE_CTS, P21G::MISSISSAGI_TS::P21G_P8_JCT, 34-P21G, P21G::P21G_P8_JCT::THIRD_LINE_CTS	CWW	Non-Recallable	None	
May 26 2005 3:15 PM	Dec 31 2005 11:59 PM	Batchawana: 596	CWW	Non-Recallable	None	

Table C5 Southwest Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
Apr 07 2004 8:30 AM	Dec 31 2005 6:00 PM	Beach TS: D1L34	CWW	Non-Recallable	None	

Table C6 Toronto Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
Oct 03 2005 5:00 AM	Nov 18 2005 6:00 PM	Manby East TS: T5-H2, T5, TR5-T, TR5-S	CWW	4 Week	None	
Mar 06 2006 5:00 AM	Apr 14 2006 6:00 PM	Manby East TS: T5, TR5-S, TR5-T, T5-H2	CWW	4 Week	None	
Oct 07 2005 5:00 AM	Dec 09 2005 6:00 PM	Claireville TS: HT14	CWW	8 Week	None	
Dec 14 2004 11:00 AM	Dec 31 2005 6:00 PM	Manby East TS: W7-P19, W8-P19, T8W, T7W	CWW	Non-Recallable	None	
Dec 25 2005 7:00 AM	Jan 20 2006 6:00 PM	Pickering B SS: L27R, T5L27, KL27, P27C::CHERRYWOOD_TS::PICKERING_B_SS, P27C::CHERRYWOOD_TS::PICKERING_B_SS, L26L27	CWW	2 Day	None	
Oct 17 2005 7:00 AM	Nov 11 2005 6:00 PM	Cherrywood TS: L9L23, T4L9, P9C::PICKERING_A_SS::CHERRYWOOD_TS, L9Q, KL9, P9C::PICKERING_A_SS::CHERRYWOOD_TS	CWW	2 Day	None	
Oct 30 2006 6:00 AM	Dec 01 2006 5:00 PM	Bridgman TS: T14-L14W, T14Y-B, T14X-H, T14	CWW	10 Day	None	
Dec 25 2005 7:00 AM	Dec 30 2005 6:00 PM	Cherrywood TS: DL6, P6C::CHERRYWOOD_TS::PICKERING_A_SS, L6K, L3L6, P6C::CHERRYWOOD_TS::PICKERING_A_SS, T1L6	CWW	2 Day	None	

Table C7 West Zone

Start Date/Time	End Date/Time	Equipment	Outage Type	Recall	Impact	Reduction in Limit
Oct 01 2005 12:01 PM	Oct 31 2005 12:01 PM	TA Sarnia: 89-891, T891	CWW	Non-Recallable	None	

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