

**IMO Year 2004 Interim Review
of
Ontario Resource Adequacy
for the period 2004 - 2008**

June 30, 2004

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Approved by the RCC on July 14, 2004

Public

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1.0 EXECUTIVE SUMMARY

The Independent Electricity Market Operator (IMO) submits this report to the Northeast Power Coordinating Council (NPCC) in fulfillment of its obligation to conduct an interim review of resource adequacy for the Ontario control area. This report follows the comprehensive review conducted in 2003. The guidelines for the review are specified in the NPCC Document B-8 entitled, “*Guidelines for Area Review of Resource Adequacy*” (Revised: June 28, 2001).

This review identifies changes in assumptions that were made for the 2003 comprehensive review, with regard to resources, demand, electricity sector regulations, etc., as well as the impact of these changes on the overall reliability of the Ontario electricity system.

This year’s assessment falls within the band of the Sensitivity Case of the 2003 comprehensive review:

- Under median demand growth assumptions, Ontario may have to secure additional resources starting in 2007 (last year’s review had 2006), in order to meet the NPCC criterion through 2008. If no new generation or demand-side resources materialize, compliance will be achieved through outage rescheduling i.e. shifting maintenance outages out of the summer months of June, July and August.
- Under high demand growth, Ontario would expect to require additional supply starting in 2005 (the same as in last year’s review), in order to comply with the NPCC resource adequacy criterion. Again, if no additional resources from generation, demand-side initiatives or imports become available, compliance can be achieved by shifting maintenance outages out of the summer months of June, July and August, in 2005, 2006 and 2007. However, in 2008, approximately 500 MW of additional resources may be required in conjunction with shifting all major outages out of June July and August, in order to achieve compliance; the 500 MW could come from a combination of generation additions, additional tie-benefit (above the 1,500 MW assumed in the 2003 review) and/or demand response.

New supply could come from construction of additional generation facilities already proposed to the IMO (approximately 6,000 MW) and from the request for proposals (RFP) process initiated by the Ontario government in May 2004, for up to 2,800 MW. Demand initiatives in lieu of new supply may also be proposed as part of the RFP process.

The Ontario government is committed to replacing coal-fired generation in the province (approximately 7,500 MW) when adequate alternatives are available. With the exception of Lakeview TGS, which will cease operation at the end of April 2005, the IMO continues to report the capability of the coal-fired generating stations beyond December 31, 2007. For purposes of this assessment, the IMO has assumed that the remaining coal-fired stations will be replaced with an equivalent amount of supply or demand-side measures, at the same or near-by locations, before being shutdown, in accordance with provincial government commitments.

Recently announced changes to the Ontario electricity sector, when implemented, are expected to have beneficial effects on the long-term supply-demand situation of the province.

2.0 INTRODUCTION

The IMO is a non-profit, regulated corporation without share capital established by the Ontario Electricity Act 1998, with its Directors appointed by the government. It is responsible for the day-to-day operation of Ontario's electricity system, and is responsible for enabling, administering and operating the competitive wholesale energy markets for the province.

The information presented in this interim area review of resource adequacy covers the period from 2004 to 2008.

The previous review was submitted by the IMO and was approved at the November 2003 meeting of the Reliability Coordinating Committee. Comparisons between this review and the November 2003, "IMO Year 2003 Comprehensive Review of Ontario Resource Adequacy" are contained in this report.

3.0 CHANGES IN ASSUMPTIONS

3.1 Demand Forecast

Tables 3.1, 3.2 and Figure 3.1 display the winter/summer peak demand forecast in both the 2003 and 2004 reviews. This year's peak demand forecast is lower, when compared to the 2003 forecast. Also, Ontario is expected to become summer peaking, under normal weather, by 2006. The energy demand is forecast to grow at an average of 0.9% per year under the median demand growth scenario (last year's forecast had 1.0%), and 1.3% per year under the high demand growth scenario (last year's forecast had 1.4%). The general decrease in forecast demand is mainly due to changes in the underlying economic projections.

Table 3.1 Comparison of Demand Forecasts – Winter Peak

Year	Normal Weather Winter Peak (January)					
	Median Demand Growth			High Demand Growth		
	2003 Comprehensive	2004 Interim	Difference	2003 Comprehensive	2004 Interim	Difference
2004	24,112	<i>23,742 (WCA)</i>	<i>-370</i>	24,420	<i>23,742 (WCA)</i>	<i>-678</i>
2005	24,233	24,153	-80	24,690	24,408	-282
2006	24,422	24,339	-83	24,977	24,764	-213
2007	24,603	24,518	-85	25,240	25,044	-196
2008	24,808	24,720	-88	25,523	25,325	-198

Note to Table 3.1: The displayed value is weather corrected actual (actual peak was 24,937 MW).

Table 3.2 Comparison of Demand Forecasts – Summer Peak

Year	Normal Weather Summer Peak (July)					
	Median Demand Growth			High Demand Growth		
	2003 Comprehensive	2004 Interim	Difference	2003 Comprehensive	2004 Interim	Difference
2004	24,014	23,806	-208	24,369	23,914	-455
2005	24,360	24,147	-213	24,845	24,450	-395
2006	24,689	24,446	-243	25,275	24,895	-380
2007	25,005	24,735	-270	25,672	25,290	-382
2008	25,326	25,027	-299	26,072	25,664	-408

3.2 Resources Forecast

Tables 3.3 and 3.4 show the resources forecast to be available to the Ontario system at the time of the seasonal peaks assumed for this review and for the 2003 review.

Table 3.3 Comparison of Available Resource Forecasts – Base Scenario

Year	Winter Peak (January)			Summer Peak (July)		
	2003 Comprehensive	2004 Interim	Difference	2003 Comprehensive	2004 Interim	Difference
2004	29,112	N/A	N/A	30,620	27,991	-2,629
2005	29,838	28,843	-995	29,142	27,910	-1,232
2006	29,350	28,598	-752	29,695	28,276	-1,419
2007	30,156	28,715	-1,441	29,731	28,226	-1,505
2008	29,894	28,169	-1,725	29,602	28,298	-1,304

Table 3.4 Comparison of Available Resource Forecasts – Sensitivity Scenario

Year	Winter Peak (January)			Summer Peak (July)		
	2003 Comprehensive	2004 Interim	Difference	2003 Comprehensive	2004 Interim	Difference
2004	29,112	N/A	N/A	30,105	27,991	-2,114
2005	29,323	28,843	-480	28,112	27,910	-202
2006	28,320	28,598	278	28,150	28,276	126
2007	28,611	28,715	104	28,186	28,226	40
2008	28,349	28,169	-180	28,057	28,298	241

Last year's review assumed that, under the Base Scenario, 3,246 MW of generation resources would come into service by the end of 2004, with another 515 MW in 2005 and 515 MW in 2006 adding to the Ontario installed resources. Also, under the Sensitivity Scenario, last year's review assumed that only 2,731 MW of additional generation resources would become available by the end of 2004.

This interim review assumes only one resource scenario, based on latest information regarding existing and future available resources. Since last year, approximately 2,000 MW of nuclear generation was returned to service from laid-up state. Another 755 MW of new gas-fired generation is expected to be fully available by this summer. Approximately 1,500 MW of nuclear capacity that was assumed last year to gradually come into service by 2006 remains in laid-up state, with return-to-service dates uncertain. However, work has progressed sufficiently on 500 MW of the laid-up nuclear capacity to warrant assuming return to service during the fourth quarter of 2005. Also, the Ontario government is committed to replacing coal-fired generation in the province (approximately 7,500 MW) when adequate alternatives are available. With the exception of Lakeview TGS, which will cease operation at the end of April 2005, the IMO continues to report the capability of the coal-fired generating stations beyond December 31, 2007. For purposes of this assessment, the IMO has assumed that the remaining coal-fired stations will be replaced with an equivalent amount of supply or demand-side measures, at the same or near-by locations, before being shutdown, in accordance with provincial government commitments.

In summary, the IMO's current forecast of available resources is very similar to last year's Sensitivity Scenario until the fourth quarter of 2005, and slightly better for the remainder of the five-year period, as shown in Table 3.4. The only notable exception is for the summer of 2004,

when higher generator unavailability is expected than in last year's forecast, based on latest in-service dates for new generators and outage plans submitted by generator owners/operators.

3.3 Fuel Supply Diversity

The majority of the proposed new generation facilities in Ontario (3,500 to 3,800 MW) are gas-fired. If all of these facilities were built, the volume of gas consumed for electricity generation could more than double, reaching approximately 20% of the total supply of gas consumed in the province. Ontario could face a supply situation similar to other parts of North America, where gas supply uncertainty exists. To date, no issues regarding gas delivery infrastructure have been identified for Ontario.

The proposed phase-out of coal-fired generation could present a unique challenge for supply contracting. Traditionally coal has been purchased under long-term contracts. For the affected stations, a delicate short-term contracting balance may be required to ensure sufficient coal is delivered until replacement supply is achieved, without leaving surplus coal after plant retirement.

3.4 Ontario Electricity Sector Changes

The new provincial government has announced a series of changes in the electricity sector. Beside a modified electricity pricing system, a new independent body called the Ontario Power Authority (OPA) has been proposed. It will have the obligation to ensure long-term supply adequacy by forecasting resource needs and preparing an integrated system plan for conservation, generation and transmission. Also, the OPA will have the responsibility and tools to call on the private sector to build new generation or initiate demand management, through a competitive procurement process. The targets for conservation and the overall supply mix in the province would be established by the Ministry of Energy and implemented by the OPA. A Conservation Bureau will also be established as part of the OPA to develop province-wide conservation programs.

The announced changes are to be implemented as soon as the necessary legislation has been passed by the Provincial Parliament. Draft legislation was published on June 16, with Royal Assent expected by year-end. The government hopes to have the OPA established and functioning by early 2005.

4.0 RESOURCE ADEQUACY ASSESSMENT

As mentioned in Section 3.2, this year's forecast of resource availability for the period of summer 2004 through the end of 2008 is very similar to the last year's Sensitivity Scenario until the fourth quarter of 2005, and slightly better for the remainder of the five-year period. Also, this year's demand forecast is generally lower. Tables 4.1 and 4.2 show the forecast reserves in this review, as well as a comparison to the 2003 review forecast reserves under the Sensitivity Case.

Table 4.1 Forecast Reserves – Normal Weather Winter Peak

Year	Normal Weather Winter Peak (January)					
	Median Demand Growth			High Demand Growth		
	2003 Comprehensive	2004 Interim	Difference	2003 Comprehensive	2004 Interim	Difference
2004	5,000	<i>N/A</i>	<i>N/A</i>	4,692	<i>N/A</i>	<i>N/A</i>
2005	5,090	4,690	-400	4,633	4,435	-198
2006	3,898	4,259	361	3,343	3,834	491
2007	4,008	4,197	189	3,371	3,671	300
2008	3,541	3,449	-92	2,826	2,844	18

Table 4.2 Forecast Reserves – Normal Weather Summer Peak

Year	Normal Weather Summer Peak (July)					
	Median Demand Growth			High Demand Growth		
	2003 Comprehensive	2004 Interim	Difference	2003 Comprehensive	2004 Interim	Difference
2004	6,091	4,185	-1,906	5,736	4,077	-1,659
2005	3,752	3,763	11	3,267	3,460	193
2006	3,461	3,830	369	2,875	3,381	506
2007	3,181	3,491	310	2,514	2,936	422
2008	2,731	3,271	540	1,985	2,634	649

When combining the two new forecasts and comparing them to last year's review, the results indicate that this year's assessment falls within the band of the Sensitivity Case of the 2003 comprehensive review:

- Under median demand growth assumptions, Ontario may have to secure additional resources starting in 2007 (last year's review had 2006), in order to meet the NPCC criterion through 2008. If no new generation or demand-side resources materialize, compliance will be achieved through outage rescheduling i.e. shifting maintenance outages out of the summer months of June, July and August.
- Under high demand growth, Ontario would expect to require additional supply starting in 2005 (the same as in last year's review), in order to comply with the NPCC resource adequacy criterion. Again, if no additional resources from generation, demand-side initiatives or imports become available, compliance can be achieved by shifting maintenance outages out of the summer months of June, July and August, in 2005, 2006 and 2007. However, in 2008, approximately 500 MW of additional resources may be required in conjunction with shifting all major outages out of June July and August, in order to achieve compliance; the 500 MW could come from a combination of generation additions, additional tie-benefit (above the 1,500 MW assumed in the 2003 review) and/or demand response.

4.1 Alleviating Factors and Contingency Mechanisms

When considering future resource additions, the IMO takes a conservative approach and only includes projects which are under construction. However, proposals for over 30 future generating facilities totaling more than 6,000 MW have been submitted to the IMO. Although only 755 MW are under construction and included in this assessment, several others are in an advanced stage of the pre-construction approval process or require a short timeframe to complete construction.

To spur additional development, the provincial government has initiated a Request for Proposals process seeking up to 300 MW of renewable energy capacity and up to 2,500 MW of new generating capacity and/or demand side initiatives to be developed as soon as practicable.

Although a tie benefit of only 1,500 MW has been assumed for purposes of this review, the coincident interconnection capability is normally in the range of 4,000 MW. Data from market opening through February 2004 reveals that, whenever demand exceeded 23,000 MW, imports averaged about 2,300 MW, and occasionally reached the 4,000 MW import capability level.

Since 2002, on a year by year basis, the IMO has implemented an Emergency Demand Response Program (EDRP). For 2004 approximately 400 MW of load was contracted under this program. The relief from the EDRP has not been modeled in this review because of the year by year nature of the program.

Every quarter, looking from one month in the future out 18 months, the IMO 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 IMO 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 desirable. They generally 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, albeit not without cost, inconvenience and potential unit reliability impacts.

Recently announced changes to the Ontario electricity sector, when implemented, are expected to have beneficial effects on the long-term supply-demand situation of the province.

5.0 CONCLUSIONS

This year's assessment falls within the band of the Sensitivity Case of the 2003 comprehensive review:

- Under median demand growth assumptions, Ontario may have to secure additional resources starting in 2007 (last year's review had 2006), in order to meet the NPCC criterion through 2008. If no new generation or demand-side resources materialize, compliance will be achieved through outage rescheduling i.e. shifting maintenance outages out of the summer months of June, July and August.
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