18-MONTH OUTLOOK

UPDATE

From September 2011 to February 2013

ieso
Power to Ontario. On Demand.

An Assessment of the Reliability and Operability of the Ontario Electricity System - Update

Executive Summary

Over the next 18 months Ontario's generation resources will continue to grow, with more than 2,500 megawatts (MW) of new and refurbished supply anticipated to be connected to Ontario's bulk power system. This includes the anticipated return of two refurbished Bruce nuclear units, the addition of approximately 400 MW of gas-fired generation in York Region and the construction of approximately 600 MW of renewable generation. By February 2013, the IESO expects a combined total of more than 4,000 MW of wind and solar generation to be connected to either the transmission grid or the distribution system.

Surplus baseload generation (SBG) remains an ongoing concern for the IESO. Throughout the fall of 2011, Ontario can expect periods of SBG similar to 2009 and 2010. There should be a brief reprieve during the higher demand winter months, followed by a re-appearance of surplus conditions in spring 2012. Maximum flexibility from all resources is imperative to successfully managing operations and costs, and having this option available for renewable resources will help the IESO manage SBG when renewable generation is high. The IESO principles for the integration of renewables are similar to those implemented in jurisdictions with comparable amounts of renewable generation. Stakeholders are being consulted through Stakeholder Engagement 91 (SE-91) to ensure appropriate implementation of these principles as the growing renewable fleet is integrated into Ontario's power system.

By December 31, 2011 the installed capacity of coal-fired generation will be reduced by 980 MW to 3,504 MW when two additional units at Nanticoke are shut down. To ensure the phase-out of coal is achieved by 2014, a number of infrastructure projects, including transmission improvements, are currently underway.

Since the last Outlook economic factors impacting energy demand have been weaker than expected, leading to lower energy demand through the first half of 2011. Energy consumption is expected to decline by 0.3 per cent in 2011 before rebounding with 2.0 per cent growth in 2012 as the economy picks up.

The following table summarizes the forecasted seasonal peak demand numbers.

Season	Normal Weather Peak (MW)	Extreme Weather Peak (MW)
Winter 2011-12	22,311	23,582
Summer 2012	23,594	26,051
Winter 2012-13	22,375	23,500

Conclusions & Observations

The following conclusions and observations are based on the results of this assessment.

Demand Forecast

- Overall electricity demand has been relatively flat since the last outlook. As a result the forecast of demand has been lowered for both 2011 and 2012.
- In the face of high unemployment rates and high debt levels, U.S. consumer consumption has remained low. This has had an impact on Ontario's manufacturing sector which is dependent on U.S. sales. The high Canadian dollar exacerbates the problem as exporters face weak demand and increased price competition.
- On the positive side, the domestic economy and the foreign demand for commodities have provided some economic stimulus for electricity demand.
- As in previous Outlooks, any growth in electricity demand is and will continue to be reduced by the conservation efforts of the Ontario Power Authority and electricity distributors.
- The growth in embedded generation capacity also reduces the demand for grid-supplied electricity.
- The net result of these factors will be to keep electricity demand relatively flat through 2011 before showing growth in 2012.
- With the forecasted peak demand levels, system reliability will remain robust. Although higher peak demands are likely under extreme weather conditions, they are not expected to pose any province-wide reliability concerns.

Resource Adequacy

- Reserve requirements are expected to be met for all weeks in all scenarios.
- Bruce units 2 and 1 are expected to be complete in Q1 and Q3 of 2012 respectively.
- York Energy Centre is expected to be in service in Q3 of 2012
- Nanticoke Units 1 and 2 are expected to be shutdown at the end of 2011

	Normal Weather Scenario	Extreme Weather Scenario
Planned Scenario	• There are no weeks when reserve is lower than required	• There are no weeks when reserve is lower than required
Firm Scenario	• There are no weeks when reserve is lower than required	• There are no weeks when reserve is lower than required

Transmission Adequacy

- With the planned system enhancements and scheduled maintenance outages, the Ontario transmission system is expected to be adequate to supply the demand under the normal and extreme weather conditions forecast for the Outlook period.

- A long-term de-rated Trafalgar autotransformer might require minor mitigation measures under extreme weather conditions if additional transmission elements become unavailable. Over the last few years the southwest GTA demand experienced moderate growth, compared to the higher growth in the previous decade, resulting in supply margins still being available. Load growth is continuing, and the IESO, OPA and Hydro One are working on a transmission solution to maintain reliable supply in the southwest GTA. Under extreme conditions, mitigating actions may be required for load security in the southwest greater Toronto area (GTA) if local transmission elements become unavailable.
- Some area loads experienced modest growth requiring additional investments in local area transmission systems. Several local area supply improvement projects are underway and will be placed in service during the timeframe of this Outlook. These projects, shown in Appendix B, help relieve loadings of existing transformer stations and provide additional transformer capacity for future load growth.
- Transmission constraints over the 230 kV lines in the Sarnia/Windsor to London area may lead to the bottling of some generation resources in southwestern Ontario. This congestion could be further compounded under certain weather conditions and transmission outages.
- In preparation for the planned removal from service of southern Ontario coal-fired units, Hydro One is installing additional reactive compensation in western and southwestern Ontario.
- Managing grid voltages in the Northwest has always required special attention, but with the significantly lower demand, it has been increasingly difficult to maintain an acceptable voltage profile without compromising the security and reliability of the supply. The IESO has contacted Hydro One, and is also in conversations with the OPA, in efforts to examine the short- and long-term solutions to this problem.
- The OPA is currently conducting an assessment of the Kitchener-Waterloo Cambridge Guelph area to recommend a solution to ensure the local area load is secure.

Operability

- The IESO is currently working with stakeholders to address potential future operability issues associated with the growing amount of renewable resources expected to come into service over the next few years.

Caution and Disclaimer

The contents of these materials are for discussion and information purposes and are provided "as is" without representation or warranty of any kind, including without limitation, accuracy, completeness or fitness for any particular purpose. The Independent Electricity System Operator (IESO) assumes no responsibility to you or any third party for the consequences of any errors or omissions. The IESO may revise these materials at any time in its sole discretion without notice to you. Although every effort will be made by the IESO to update these materials to incorporate any such revisions it is up to you to ensure you are using the most recent version.

Table of Contents

List of Tables

List of Figures

1.0 Introduction

This Outlook covers the 18-month period from September 2011 to February 2013 and supersedes the last Outlook released in May 2011.

The purpose of the 18-Month Outlook is:

- To advise market participants of the resource and transmission reliability of the Ontario electricity system;
- To assess potentially adverse conditions that might be avoided through adjustment or coordination of maintenance plans for generation and transmission equipment; and
- To report on initiatives being put in place to improve reliability within the 18-month timeframe of this Outlook.

The contents of this Outlook focus on the assessment of resource and transmission adequacy. Additional supporting documents are located on the IESO website at http://www.ieso.ca/imoweb/monthsYears/monthsAhead.asp

This Outlook presents an assessment of resource and transmission adequacy based on the stated assumptions, 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 judgment in considering possible future scenarios.

Security and Adequacy Assessments are published on the IESO website on a weekly and daily basis, and progressively supersede information presented in this report.

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:

- Toll Free: 1-888-448-7777
- Tel: 905-403-6900
- Fax: 905-403-6921
- E-mail: customer.relations@ieso.ca.

- End of Section -

2.0 Updates to This Outlook

2.1 Updates to Demand Forecast

The demand forecast was based on actual demand, weather and economic data through to the end of May 2011. The economic outlook has been updated based on the most recent data. Actual weather and demand data for June has been included in the tables.

2.2 Updates to Resources

No changes have been reported since the previous Outlook.

The assessment uses planned generator outages as submitted by market participants to the IESO's Integrated Outage Management System (IOMS). This Outlook is based on submitted generation outage plans as of June 23, 2011.

2.3 Updates to Transmission Outlook

The list of transmission projects, planned transmission outages and actual experience with forced transmission outages have been updated from the previous 18-Month Outlook. For this Outlook, transmission outage plans submitted to the IOMS as of June 23, 2011 were used.

2.4 Updates to Operability Outlook

An outlook of surplus baseload generation (SBG) conditions for the next 18 months has been updated with submitted generation outage plans as of June 23, 2011. The expected contribution to baseload from variable resources such as hydroelectric and wind generation has also been updated to reflect the most recent information. Furthermore, figure 6.1 indicates the potential SBG conditions by illustrating the range of weekly minimum demands rather than the absolute minimum weekly demand. The average weekly demand is also been included in the figure.

- End of Section -

3.0 Demand Forecast

The IESO is responsible for forecasting electricity demand on the IESO-controlled grid. This demand forecast covers the period September 2011 to February 2013 and supersedes the previous forecast released in May 2011. Tables of supporting information are contained in the 2011 Q3 Outlook Tables spreadsheet.

Electricity demand is expected to show limited growth over the remainder of 2011 before showing more strength in 2012. Ontario's energy-intense export industries will continue to be hampered by the low U.S. dollar and sluggish U.S. economy. Peak demands are expected to show slight increases over the forecast horizon as conservation programs, the growth in embedded generation and time-of-use rates will act to offset most of underlying growth driven by economic expansion and population growth.

The following table shows the seasonal peaks and annual energy demand over the forecast horizon of the Outlook.

Table 3.1: Forecast Summary

Season	Normal Weather Peak (MW)	Extreme Weather Peak (MW)
Winter 2011-12	22,311	23,582
Summer 2012	23,594	26,051
Winter 2012-13	22,375	23,500
Year	**Normal Weather Energy (TWh)**	**% Growth in Energy**
2006 Energy	152.3	-1.9%
2007 Energy	151.6	-0.5%
2008 Energy	148.9	-1.8%
2009 Energy	140.4	-5.7%
2010 Energy	142.1	1.2%
2011 Energy (Forecast)	141.7	-0.3%
2012 Energy (Forecast)	144.5	2.0%

Forecast Details

The following table shows the weekly peak and energy demands for the system. Tables in the 2011 Q3 Outlook Tables spreadsheet contain additional demand information on both the forecast and historical data.

Table 3.2: Weekly Energy and Peak Demand

Week Ending	Normal Peak (MW)	Extreme Peak (MW)	Load Forecast Uncertainty (MW)	Normal Energy Demand (GWh)	Week Ending	Normal Peak (MW)	Extreme Peak (MW)	Load Forecast Uncertainty (MW)	Normal Energy Demand (GWh)
04-Sep-11	22,110	24,686	1,221	2,824	03-Jun-12	19,192	23,596	1,593	2,563
11-Sep-11	20,304	23,349	1,689	2,543	10-Jun-12	19,939	23,663	1,408	2,636
18-Sep-11	19,298	22,742	1,468	2,565	17-Jun-12	20,771	24,727	1,608	2,718
25-Sep-11	18,993	20,753	1,546	2,477	24-Jun-12	22,410	25,232	1,029	2,728
02-Oct-11	17,817	18,865	515	2,495	01-Jul-12	22,977	25,177	1,144	2,839
09-Oct-11	18,026	18,544	440	2,518	08-Jul-12	22,886	24,822	1,030	2,796
16-Oct-11	17,666	18,229	362	2,467	15-Jul-12	23,594	26,051	942	2,877
23-Oct-11	17,904	18,404	391	2,562	22-Jul-12	23,590	24,760	1,051	2,901
30-Oct-11	18,437	18,898	409	2,580	29-Jul-12	23,190	25,433	782	2,779
06-Nov-11	18,677	19,387	515	2,576	05-Aug-12	23,305	25,980	1,178	2,891
13-Nov-11	19,297	20,026	577	2,650	12-Aug-12	22,712	25,513	1,261	2,833
20-Nov-11	19,947	20,675	455	2,732	19-Aug-12	22,565	24,532	997	2,838
27-Nov-11	20,371	20,983	602	2,792	26-Aug-12	22,147	24,635	1,012	2,795
04-Dec-11	20,755	21,849	536	2,839	02-Sep-12	21,918	25,152	1,260	2,806
11-Dec-11	21,556	22,497	528	2,916	09-Sep-12	21,119	23,713	1,618	2,683
18-Dec-11	21,557	22,589	622	2,942	16-Sep-12	19,561	23,154	1,515	2,608
25-Dec-11	21,830	22,847	519	2,960	23-Sep-12	19,629	21,779	828	2,554
01-Jan-12	20,939	22,198	515	2,763	30-Sep-12	19,277	20,541	437	2,571
08-Jan-12	21,875	23,024	617	2,950	07-Oct-12	18,293	18,956	653	2,556
15-Jan-12	22,311	23,299	657	3,067	14-Oct-12	17,958	18,947	622	2,524
22-Jan-12	22,296	23,582	660	3,069	21-Oct-12	18,110	18,662	530	2,580
29-Jan-12	22,193	23,167	619	3,061	28-Oct-12	18,755	19,197	603	2,607
05-Feb-12	21,970	22,842	522	3,024	04-Nov-12	18,735	19,974	774	2,613
12-Feb-12	21,522	22,787	670	3,030	11-Nov-12	19,842	20,235	572	2,703
19-Feb-12	21,655	22,731	500	2,998	18-Nov-12	20,154	20,901	434	2,768
26-Feb-12	20,919	22,442	419	2,881	25-Nov-12	20,615	21,238	490	2,825
04-Mar-12	20,792	22,072	495	2,926	02-Dec-12	21,039	21,785	653	2,870
11-Mar-12	20,965	21,815	440	2,919	09-Dec-12	21,810	22,762	497	2,955
18-Mar-12	19,890	20,738	756	2,829	16-Dec-12	21,829	22,882	481	2,976
25-Mar-12	19,533	20,379	718	2,790	23-Dec-12	22,140	23,121	473	3,019
01-Apr-12	19,222	20,156	820	2,691	30-Dec-12	20,220	21,907	437	2,744
08-Apr-12	18,871	19,939	802	2,647	06-Jan-13	22,100	23,092	688	2,978
15-Apr-12	18,270	19,194	530	2,596	13-Jan-13	22,375	23,500	562	3,129
22-Apr-12	17,870	18,885	401	2,532	20-Jan-13	22,254	23,032	535	3,079
29-Apr-12	17,483	18,822	574	2,532	27-Jan-13	22,122	22,913	594	3,081
06-May-12	17,490	20,427	749	2,504	03-Feb-13	22,022	22,869	583	3,109
13-May-12	18,038	20,990	603	2,508	10-Feb-13	21,806	22,620	552	3,053
20-May-12	17,998	20,626	821	2,486	17-Feb-13	21,385	22,773	547	2,975
27-May-12	19,196	22,824	1,063	2,465	24-Feb-13	21,258	22,742	492	2,969

3.1 Actual Weather and Demand

Since the last forecast the actual demand and weather data for May and June have been recorded.

- May was cooler than normal. Weather-corrected energy demand was 10.7 TWh (10.8 TWh actual) which was a significant drop from 2010. The monthly peak was 20,847 MW and occurred on May 31st, the hottest day of the month. This peak day was much warmer than normal leading to a weather-corrected peak of 18,708 MW. Other than May 2009 this was the lowest May (both in peak and energy) since market opening.
- Wholesale customers' consumption dropped in May 2011 compared to the previous year. Since the end of the recession, wholesale customers' consumption had shown 13 months of consecutive growth until this month.

- June's weather was a little warmer than normal due to the fact that there was very little of the cooler weather that is typical of June. This was a result of the month starting off quite hot. The peak occurred on the hottest day which was June 8th. The peak demand was 22,675 MW (21,900 MW weather-corrected). Energy demand for the month was 11.2 TWh both actual and weather-corrected. As in May, total monthly energy demand was lower than the previous year, ranking second only the recessionary 2009.
- Wholesale customers' consumption dropped in June 2011 compared to the previous year. Unlike May's reduction (-1.6%), the decline in June was substantial (-7.3%).

Demand for the first half of 2011 is fairly flat compared to last year with actual demand up only 0.4% for the first six months. Wholesale customers' consumption in 2011 increased by 4.4% in the first quarter and decreased by 2.5% in the second.

The 2011 Q3 Outlook Tables spreadsheet has several tables with historical data. They are:

- Table 3.3.1 Weekly Weather and Demand History Since Market Opening
- Table 3.3.2 Monthly Weather and Demand History Since Market Opening
- Table 3.3.3 Monthly Demand Data by Market Participant Role.

3.2 Forecast Drivers

Economic Outlook

The global economy continues to stumble along plagued by debt concerns and high unemployment rates in the west. Though Canada is not suffering directly from these issues, as an export based economy we are feeling the impacts indirectly. Both the high debt levels and unemployment rates will take significant time to rectify but near term progress could help boost consumer confidence and in turn demand. Given these factors the economy is expected to show little improvement in the remainder of 2011 before posting some modest growth in 2012. Over the forecast, economic growth will come in sectors that are not particularly electrically intensive but overall electricity demand growth will continue to lag economic growth.

- Table 3.3.4 of the 2011 Q3 Outlook Tables spreadsheet has the economic assumptions for the demand forecast.

Weather Scenarios

For the purpose of forecasting the IESO uses weather scenarios to produce demand forecasts. These scenarios include Normal and Extreme weather, along with a measure of uncertainty in demand due to weather volatility. This measure is called Load Forecast Uncertainty.

- Table 3.3.5 of the 2011 Q3 Outlook Tables spreadsheet has the weekly weather data for the forecast period.

Conservation and Demand Management

Conservation will continue to grow throughout the forecast. The demand forecast is decremented for the impacts of conservation and embedded generation.

Demand measures such as dispatchable loads, demand response programs, and contracted loads are not decremented from the demand forecast but instead are treated as resources in the assessment. Therefore the effects of demand measures are added back into the demand history and the forecast is produced

prior to these impacts. That total demand measure capacity is discounted – based on historical and contract data – to reflect the reliably available capacity.

- End of Section -

4.0 Resource Adequacy Assessment

This section provides an assessment of the adequacy of resources to meet the forecast demand. When reserves are below required levels, with potentially adverse effects on the reliability of the grid, the IESO has the authority to reject outages based on their order of precedence. Conversely, an opportunity exists for additional outages when reserves are above required levels. These actions address shortages and surpluses of reserves to a large extent.

In recognition of the uncertainty that exists regarding the future availability of resources, two resource scenarios are described in this section: the Firm Scenario and the Planned Scenario

In addition to approximately 600 MW of new renewable supply, York Region Energy Centre and the Bruce G1 and G2 units are also scheduled to come into service over the Outlook period. These new supply projects are currently at various stages of their construction.

Two units at Nanticoke are expected to shut down at the end of this year.

The existing installed generating capacity is summarized in Table 4.1. This excludes capacity that is commissioning.

Table 4.1 Existing Generation Resources as of August 2, 2011

Fuel Type	Total Installed Capacity (MW)	Forecast Capability at Winter Peak* (MW)	Number of Stations	Change in Installed Capacity (MW)	Change in Stations
Nuclear	11,446	10,586	5	0	0
Hydroelectric	7,947	6,189	71	0	0
Coal	4,484	3,387	4	0	0
Oil / Gas	9,549	8,457	28	0	0
Wind	1,334	463	10	0	0
Biomass / Landfill Gas	122	50	6	0	0
Total	34,882	29,132	124	0	0

* Actual Capability may be less as a result of transmission constraints

4.1 Committed and Contracted Generation Resources

Table 4.2 summarizes generation that is scheduled to come into service, be upgraded or shut down within the Outlook period. This includes generation projects in the IESO's Connection Assessment and Approval Process (CAA) that are under construction and projects contracted by the OPA. Details regarding the IESO's CAA process and the status of these projects can be found on the IESO's website at http://www.ieso.ca/imoweb/connassess/ca.asp.

The estimated effective date in Table 4.2 indicates the date on which additional capacity is assumed to be available to meet Ontario demand or existing capacity shut down. For projects that are under contract, the estimated effective date is the best estimate of the date when the contract requires the additional capacity to be available. If a project is delayed the estimated effective date will be the best estimate of the commercial in-service date for the project.

Table 4.2 Committed and Contracted Generation Resources

Project Name	Zone	Fuel Type	Estimated Effective Date	Change	Project Status	Capacity Considered	
						Firm (MW)	Planned (MW)
Raleigh Wind Energy Centre (RES III)	West	Wind	2011-Q3		Commissioning	78	78
Becker Cogeneration (CHP III)	Northwest	Biomass	2011-Q3		Construction	15	15
Nanticoke Units 1 and 2	Southwest	Coal	2011-Q4			-980	-980
Greenwich Wind Farm (RES III)	Northwest	Wind	2011-Q4		Commissioning	99	99
Conestogo Wind Energy Centre 1 (FIT)	Southwest	Wind	2011-Q4		pre-NTP		69
Bruce Unit 2	Bruce	Uranium	2012-Q1		Construction		750
Summerhaven Wind Energy Centre (FIT)	Southwest	Wind	2012-Q1		pre-NTP		125
Leamington Pollution Control Plant	West	Oil	2012-Q2		Construction		2
Bruce Unit 1	Bruce	Uranium	2012-Q3		Construction		750
York Energy Centre	Toronto	Gas	2012-Q3		Construction		393
Comber Wind Limited Partnership (FIT)	West	Wind	2012-Q3		NTP		166
Pointe Aux Roches Wind (FIT)	West	Wind	2012-Q3		pre-NTP		49
Thunder Bay Condensing Turbine Project	Northwest	Biomass	2013-Q1		Connection Assessment		40
Total						**-788**	**1,556**

Notes to Table 4.2:

1. Shading indicates a change from the previous Outlook.
2. The total may not add up due to rounding. Total does not include in-service facilities.
3. Project status provides an indication of the project progress. The milestones used are:
    a. Connection Assessment - the project is undergoing an IESO system impact assessment
    b. Approvals & Permits - the proponent is acquiring major approvals and permits required to start construction (e.g. environmental assessment, municipal approvals etc.)
    c. Construction - the project is under construction
    d. Commissioning - the project is undergoing commissioning tests with the IESO
    e. Feed-in Tariff (FIT) projects are categorized as at Notice to Proceed (NTP) or at pre-NTP. OPA issues NTP when the project proponent provides necessary approvals and permits, finance plan, Domestic Content Plan and documentation on impact assessment required by the Transmission System Code or the Distribution System Code.

4.2 Summary of Scenario Assumptions

In order to assess future resource adequacy, the IESO must make assumptions on the amount of available resources. The Outlook considers two scenarios: a Firm Scenario and a Planned Scenario as compared in Table 4.3

Both scenarios' starting point is the existing installed resources shown in Table 4.1. The Planned Scenario assumes that all resources that are scheduled to come into service are available over the study period while the Firm Scenario only assumes those scheduled to come into service over the first three months and generators that have started commissioning. Both scenarios recognize that resources that are in service are not available during times for which the generator has submitted planned outages. Also considered for both scenarios are generator-planned shutdowns or retirements which have high certainty of happening in the future. The Firm and Planned Scenarios also differ in their assumptions regarding the amount of demand measures.

The generation capability assumptions are as follows:

- The hydroelectric capability (including energy and operating reserve) for the duration of this outlook is based on median historical values during weekday peak demand hours from May 2002 to March 2011.
- Thermal generators' capacity and energy contributions are based on market participant submissions, including planned outages, expected forced outage rates and seasonal deratings.
- For wind generation the monthly Wind Capacity Contribution (WCC) values, which can be found in the Methodology to Perform Long Term Assessments, are used at the time of weekday peak, while total energy contribution is assumed to be 29%.

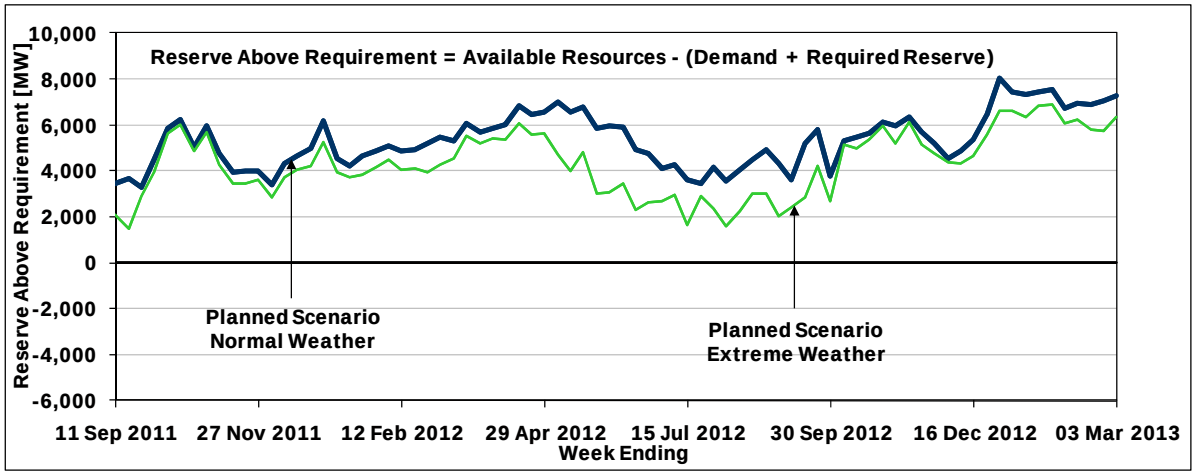
Table 4.3 Summary of Scenario Assumptions

Assumptions		Planned Scenario	Firm Scenario
Resource	Existing Installed Resources	Total Capacity	Total Capacity
		34,882	34,882
	New Generation and Capacity Changes	All	Generator shutdowns or retirements, Commissioning Generators and Generators starting in the first 3 months
		1,556	-788
Demand Forecast	Conservation	Incremental	
		Incremental growth of 90 MW on summer peak	
	Embedded Generation	Incremental	
		Incremental growth of 60 MW on summer peak	
	Demand Measures	Incremental	Existing
		1,206	969

4.3 Planned Scenario with Normal and Extreme Weather

Reserve Above Requirement levels, which represent the difference between Available Resources and Required Resources, are shown in Figure 4.1.

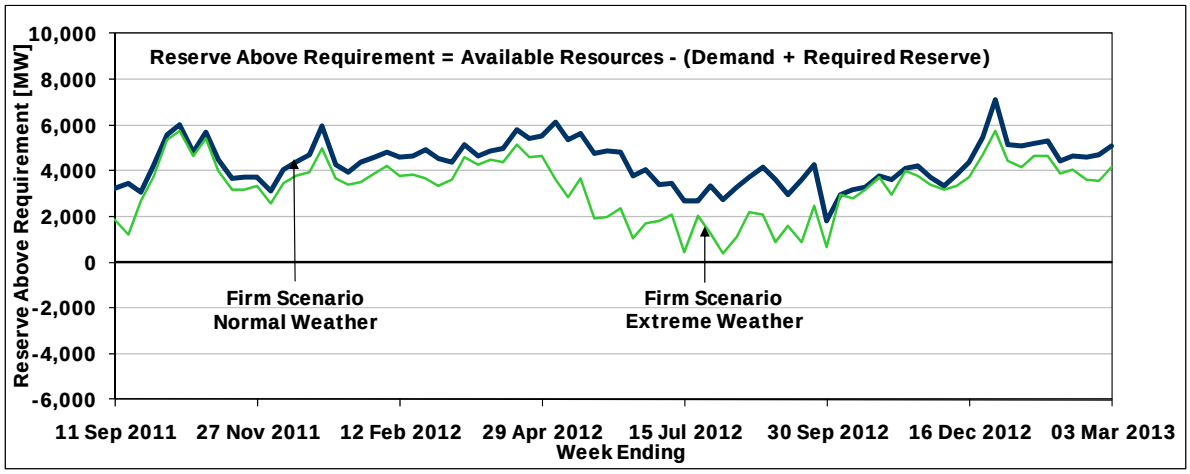
Figure 4.1 Reserve Above Requirement: Planned Scenario with Normal vs. Extreme Weather



4.4 Firm Scenario with Normal and Extreme Weather

Reserve Above Requirement levels, which represent the difference between Available Resources and Required Resources, are shown in Figure 4.2.

Figure 4.2 Reserve Above Requirement: Firm Scenario with Normal vs. Extreme Weather



4.5 Comparison of Resource Scenarios

Table 4.4 shows a snapshot of the forecast available resources, under the two scenarios, at the time of the summer and winter peak demands during the Outlook.

The monthly forecast of energy production capability, as provided by market participants, is included in the 2011 Q3 Outlook Tables Appendix A, Table A7.

Table 4.4 Summary of Available Resources

Notes	Description	Winter Peak 2012		Summer Peak 2012		Winter Peak 2013	
		Firm Scenario	Planned Scenario	Firm Scenario	Planned Scenario	Firm Scenario	Planned Scenario
1	Installed Resources (MW)	33,995	34,163	33,995	35,040	33,995	36,397
2	Imports (MW)	0	0	0	0	0	0
3	Total Resources (MW)	33,995	34,163	33,995	35,040	33,995	36,397
4	Total Reductions in Resources (MW)	5,369	5,492	5,237	5,722	4,267	4,755
5	Demand Measures (MW)	969	1,205	969	1,379	969	1,379
6	Available Resources (MW)	29,595	29,876	29,727	30,697	30,697	33,021

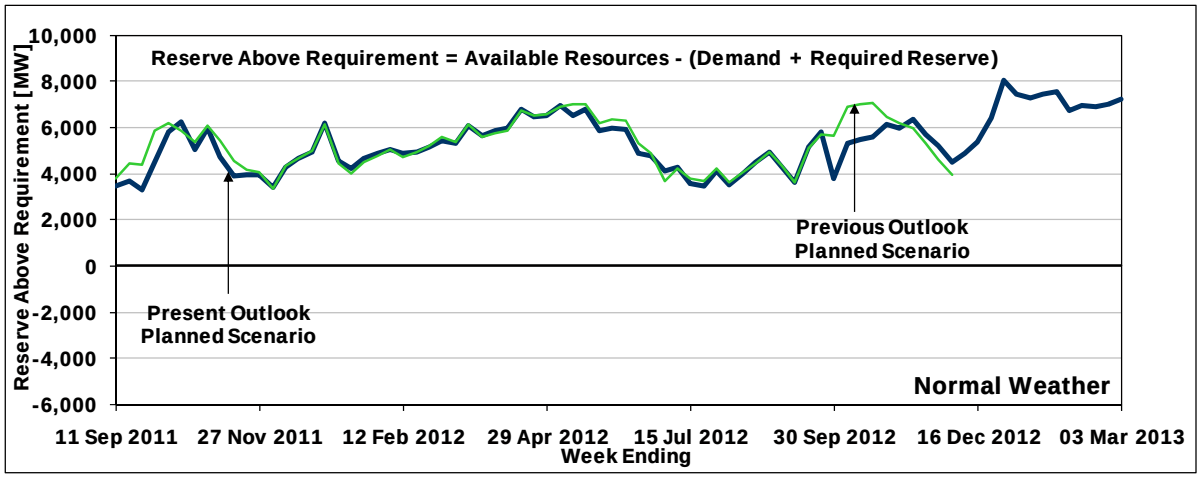
Notes to Table 4.4:

1. Installed Resources: This is the total generation capacity assumed to be installed at the time of the summer and winter peaks.
2. Imports: The amount of external capacity considered to be delivered to Ontario.
3. Total Resources: The sum of Installed Resources (line 1) and Imports (line 2).
4. Total Reductions in Resources: Represent the sum of deratings, planned outages, limitations due to transmission constraints, generation constraints due to transmission outages/limitations and allowance for capability levels below rated installed capacity.
5. Demand Measures: The amount of demand available to be reduced.
6. Available Resources: Equals Total Resources (line 3) minus Total Reductions in Resources (line 4) plus Demand Measures (line 5).

Comparison of the Weekly Adequacy Assessments for the Planned Scenario

Figure 4.3 provides 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 May 24, 2011. The difference is mainly due to the changes to outages, and the change in the demand forecast.

Figure 4.3 Reserve Above Requirement: Planned Scenario with Present Outlook vs. Previous Outlook



Resource adequacy risks are discussed in detail in the "Methodology to Perform Long Term Assessments" (IESO_REP_0266).

- End of Section -

5.0 Transmission Reliability Assessment

This section provides an assessment of the reliability of the Ontario transmission system for the Outlook period. The transmission reliability assessment has three key objectives:

- Identify all major transmission and load supply projects that are planned for completion during the Outlook period and present their reliability benefits;
- 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 its base flow limit;
- Identify equipment outages that could require contingency planning by market participants or by the IESO. Planned transmission outages are reviewed in conjunction with major planned resource outages and the scheduled completion of new generation and transmission projects to identify reliability risks.

5.1 Transmission and Load Supply Projects

The IESO requires transmitters to provide information on the transmission projects that are planned for completion within the 18-month period. Construction of several transmission reinforcements is expected to be completed during the Outlook period. Major transmission and load supply projects planned to be in service are shown in Appendix B. Projects that are in service or whose completion has been deferred well beyond the period of this Outlook are not shown. The list includes only the transmission projects that represent major modifications or are considered to significantly improve system reliability. Minor transmission equipment replacements or refurbishments are excluded.

Some area loads have experienced modest growth requiring additional investments in new load supply stations and reinforcements of local area transmission. Several local area supply improvement projects are underway and will be placed in service during the timeframe of this Outlook. These projects help relieve loadings of existing transformer stations and provide additional transformer capacity for future load growth.

5.2 Transmission Outages

The assessment of transmission outages is limited to those with a scheduled duration of greater than five days or to those outages that are part of a project where the combined scheduled duration is greater than five days. As the start time of the outage approaches, actual outage schedule and additional outage requirements, as well as outages with a scheduled duration of five days or less, could impose further transmission capacity restrictions. 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.

The IESO's assessment of the transmission outage plans is shown in Appendix C, Tables C1 to C10. In these tables, each element is assessed individually by indicating the possible impacts and the reduction in transmission interface and interconnection limits. When multiple outages are scheduled during the same period, the combined effect of all outages on the reduction in transmission interface and interconnection limits is presented. When multiple outages are scheduled during the same period and reliability is affected, the IESO will request the transmitter to reschedule some of the outages. 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).

The planned transmission outages are reviewed in correlation with major planned resource outages and scheduled completion dates of new generation and transmission projects. This allows the IESO to identify transmission system reliability concerns and to highlight those outage plans that need to be adjusted. A change to an outage may include rescheduling the outage, reducing the scheduled duration or reducing the recall time.

This assessment will also identify any resources that have potential or are forecast to be constrained due to transmission outage conditions. Transmitters and generators are expected to develop 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 a deficiency in reserve is forecast. Under the Market Rules, when the scheduling of planned outages by different market participants 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 will 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. This Outlook contains transmission outage plans submitted to the IESO as of June 23, 2011.

5.3 Transmission System Adequacy

Generally, IESO Outlooks identify the areas of the IESO-controlled grid where the projected extreme weather loading is expected to approach or exceed the capability of the transmission facilities for the conditions forecast in the planning period. In these situations there is also an increased risk of load interruptions.

The Ontario generation mix is changing rapidly with the addition of new renewable resources and the planned shutdown or conversion of coal resources. The transmission system needs to evolve to accommodate the supply mix changes and the incorporation of new generation while maintaining the reliable delivery of electricity to consumers. Over the last few years, Hydro One, the OPA and the IESO have been collaborating in the development of a number of transmission enhancements required to accommodate these changes. Some of these transmission enhancements are scheduled to come into service during this Outlook period.

The IESO works with Hydro One and other Ontario transmitters to identify the highest priority transmission needs, and to ensure that those projects whose in-service dates are at risk are given as much priority as practical, especially those addressing reliability needs for peak demand periods of this Outlook. We have also been working closely with the OPA on identifying the transmission enhancements' location, timing and requirements to satisfy reliability standards.

Within the context of this approach, and with the planned system enhancements and known transmission outages, the Ontario transmission system is expected to be adequate to supply the demand under the normal weather conditions forecast for the Outlook period.

5.3.1 Toronto and Surrounding Area

The Greater Toronto Area (GTA) electricity supply is expected to be adequate to meet the forecasted demand. Some minor mitigating measures may be required under extreme conditions to accommodate a long term de-rated 500/230 kV autotransformer at Trafalgar TS and other possible unavailability events.

Over the last few years the southwest GTA demand experienced moderate growth, compared to the higher growth seen in the previous decade, resulting in adequate supply margins still being available under normal conditions. However, to maintain reliability of supply under extreme conditions in the area, transmission solutions are now being considered. Until a transmission solution is in place some

mitigating measures may be required under extreme conditions if local transmission elements become unavailable.

The York Region load-serving capability will be reinforced with the addition of York Energy Centre which is scheduled to go in service in the third quarter of 2012 to alleviate transmission constraints in the area.

5.3.2 Bruce and Southwest Zones

Planned refurbishments at the Bruce A generating station and new wind power resources in southwestern Ontario will increase generation capacity in the Bruce and Southwest zones. The interim transmission reinforcements required to accommodate the extra generation are on schedule with the installation of dynamic voltage control facilities at Nanticoke and Detweiler and modifications to the existing Bruce special protection system that will continue during this Outlook period.

In the longer term, the planned 500 kV line from Bruce to Milton, expected in service late 2012, will provide the required transmission capability to deliver the full benefits of the Bruce refurbishment project and the development of new renewable resources in southwestern Ontario. The work will continue during this Outlook period with some outages having the potential to temporarily reduce the transfer capability out of the Bruce zone. Hydro One and the affected parties are implementing an outage plan designed to minimize the overall impact of these outages.

To prevent low voltage conditions in the 115 kV transmission system in the Woodstock area during summer extreme weather conditions, Hydro One is planning to add a new transformer station and a second supply point by extending the 230 kV transmission lines from Ingersoll to the Woodstock area and installing a new 230/115 kV transformer station. These plans, scheduled to be completed during the fourth quarter of 2011, will provide an increased level of supply reliability, and support further load growth in the area.

The planned outages in the Southwest zone may result in some transfer capability reductions of the transmission circuits but are not expected to have any impact on the load supply in this area.

In the Guelph area, the existing 115kV transmission facilities are operating close to capacity and have limited margin to accommodate additional load. A combined effort by the OPA, Hydro One, the affected distributors and the IESO is expected to determine the optimum solution for enhancing the overall supply capability to this area.

As identified in previous IESO reports the existing transmission infrastructure in the Cambridge area is unable to meet the IESO's load restoration criteria following a contingency. The OPA is currently examining solutions, to alleviate this issue.

5.3.3 Niagara Zone

The completion date for transmission reinforcements from the Niagara region into the Hamilton-Burlington area continues to be delayed. This delay impacts the use of available Ontario generation in the Niagara area, particularly during hot weather and high demand periods.

The planned outages in the Niagara zone may result in some transfer capability reductions of the transmission circuits but are not expected to have any impact on the load supply in this area.

The failed R76 voltage regulator and the BP76 circuit are expected to return to service by the end of 2012. The bypass constructed in Q4 of 2010 will remain available for use if required until the R76 voltage regulator returns.

5.3.4 East Zone and Ottawa Zone

The planned outages in the East and Ottawa zones may result in some transfer capability reductions of the transmission circuits but are not expected to have any impact on the load supply in this area.

5.3.5 West Zone

Transmission constraints in this zone may restrict resources in southwestern Ontario. This is evident in the bottled generation amounts shown for the Bruce and West zones in Tables A3 and A6.

The planned outages in the West zone may result in some transfer capability reductions of the transmission circuits but are not expected to have any impact on the load supply in this area.

The long term forced outage of N21W and N22W has resulted in some transfer capability reductions of the transmission circuits but is not expected to have any impact on the load supply in this area.

Phase angle regulators (PARs) are installed on the Ontario-Michigan interconnection at Lambton TS on the Ontario side and at Bunce Creek TS in Michigan, representing three of the four interconnections with Michigan. These will not be operational until completion of agreements between the IESO, MISO, Hydro One and International Transmission Company (ITC). The operation of these PARs along with the PAR on the Ontario-Michigan interconnection near Windsor will control flows to a limited extent, and assist in the management of system congestion.

5.3.6 Northeast and Northwest Zones

Hydro One recently completed the installation of the series compensation on the 500 kV north-south lines at Nobel SS. This facility, together with dynamic reactive compensation soon to be installed at Porcupine TS, will alleviate north-south transmission congestion and help incorporate the future Lower Mattagami expansion projects and other renewable generation resources. To further improve the north-south transfer capability Hydro One will install static reactive compensation facilities at Porcupine TS and Hanmer TS with a planned in-service date during the fourth quarter of 2011; dynamic reactive compensation faculties at Kirkland Lake TS with a planned in-service date during the third quarter of 2011; and static reactive compensation at Pinard TS with a planned in-service date during the third quarter of 2012.

Managing grid voltages in the Northwest has always required special attention. With significantly lower demands over the past few years, it has become increasingly difficult to maintain an acceptable voltage profile without compromising the reliability of supply, in particular during times of low east-west transfers.

On several occasions normal dispatch actions have been exhausted, and exceptional voltage control measures, including the temporary removal of one or more transmission circuits from service, were implemented to maintain the grid voltages within acceptable ranges. This reduced the grid's ability to withstand disturbances and impacted customers' supply reliability.

The planned outages in the Northeast and Northwest zones may result in some transfer capability reductions of the transmission circuits but are not expected to have any impact on the load supply in this area.

To reduce and eventually eliminate the dependence on such measures during operations, additional reactive compensation is required for voltage control in this zone. The IESO has contacted Hydro One, and is also in conversations with the OPA, in an effort to examine the short- and long-term solutions to this problem.

Some loads in the north of Dryden to Pickle Lake area experienced significant growth over the last few years and recently indicated their intention to expand operations. The transmission circuits in the area are currently operating close to their capability and have no margin to support the expected load growth without upgrades or reinforcements.

- End of Section -

6.0 Operability Assessment

The IESO monitors existing and emerging operability issues that could potentially impact system reliability. Although over this past quarter instances of surplus baseload generation (SBG) have lessened with the warmer temperatures increasing demand, SBG remains an ongoing concern for the IESO. The reprieve we experienced over the summer is expected to end as demand grows smaller in the spring of 2012.

Figure 6.1 Minimum Demand and Baseload Generation

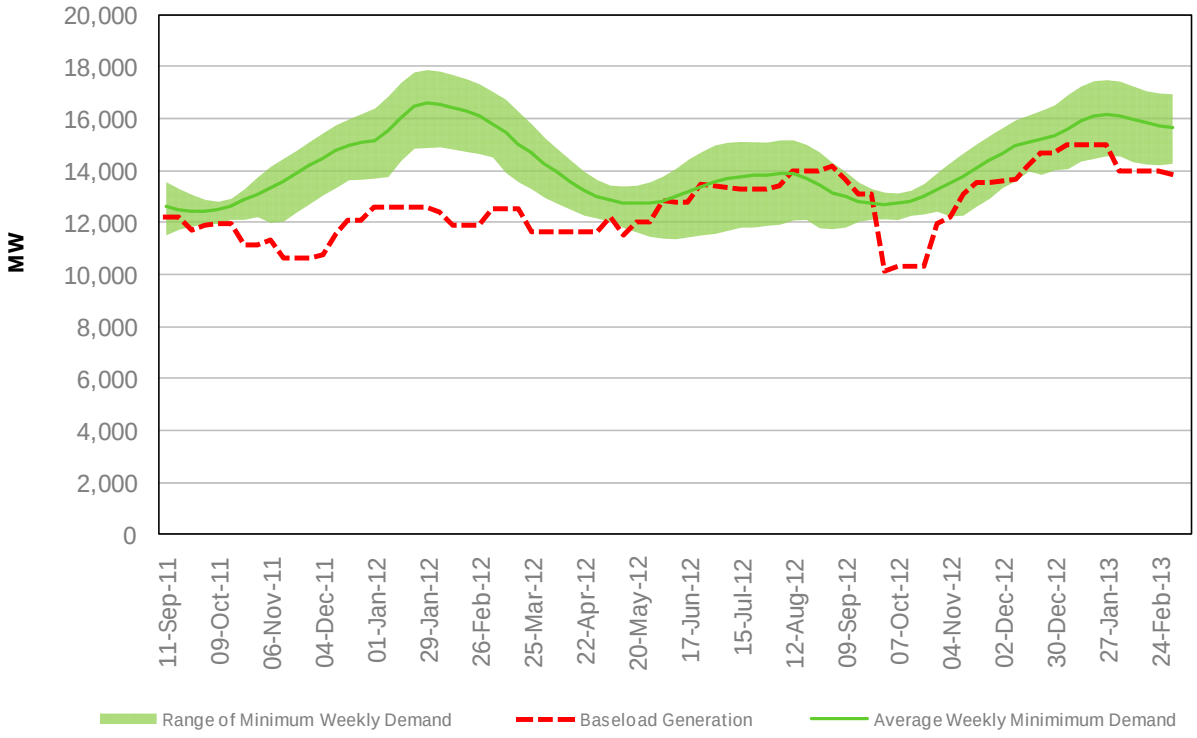


Figure 6.1 Baseload generation assumptions have been updated to include exports[1], the latest planned outage information, market participant submitted data, and in-service dates for new or refurbished generation. The expected contribution from self-scheduling and intermittent generation has also been updated to reflect the latest data. Output from commissioning units is explicitly excluded from this analysis due to uncertainty and the highly variable nature of commissioning schedules.

A lack of direct control over a number of factors that contribute to SBG, such as temperature, weather, consumption and market behavior, contributes to difficulty in managing the condition. A low demand period with heavy winds, during freshet with neighbours either unwilling or unable to take our exports may lead to a nuclear unit shutdown, which in turn would cause that generation to be unavailable for 48 to 72 hours. However, a similar low demand period with no wind and a strong ability to export could

[11] An export assumption of 1,500 MW is applied under conditions which allow Ontario's aggregate export capability to be higher than 2,600 MW. The 1,200 MW export assumption will be applied when forecast planned outages are expected to limit Ontario's aggregate export capacity to between 1,400MW and 2,600 MW. For forecast planned outages that further limit export capacity to below 1,400 MW, an export assumption value of 700 MW will be used. See Appendix C of the 18-Month Outlook Tables for forecast reduction to major transmission interface limits, including interconnection interfaces.

require no mitigating actions. As such, any control that can be acquired over these parameters would help mitigate the need for less desirable control actions such as nuclear shutdowns.

A willingness to alter output during times of surplus, as demonstrated by the Ontario Electricity Financial Corporation's (OEFC) management of the Non-Utility Generators (NUGs), limits the use of out of market actions which is key to the efficiency of the Ontario electricity market. With wind and solar becoming more prominent resources on our system, the need for maximum flexibility from all resources has become integral for the reliable and efficient operation of the grid. The IESO principles for integration of renewables are similar to those implemented in jurisdictions with comparable amounts of renewable generation. Stakeholders are being consulted through Stakeholder Engagement 91 (SE-91) to ensure appropriate implementation of these principles as the growing renewable fleet is integrated into Ontario's power system.

Ontario can expect periods of SBG similar to 2009 and 2010, with a brief reprieve during the higher demand winter months, followed by a re-appearance in spring 2012. During these periods of SBG, , beyond typical market actions such as exports, minimum hydro dispatch and nuclear manoeuvers, some out of market control actions are expected to be required in order to manage the surplus condition.

- End of Section -

- End of Document -