18-MONTH OUTLOOK

From June 2011 to November 2012

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Power to Ontario. On Demand.

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

Executive Summary

More than 2,500 megawatts of new and refurbished generation is expected to be connected to Ontario's bulk power system over the next 18 months. This includes the anticipated return of two refurbished Bruce nuclear units, the addition of approximately 400 megawatts (MW) of gas-fired generation in York Region and the construction of approximately 700 MW of renewable generation. This will bring Ontario's total renewable portfolio to 2,000 MW on the IESO connected grid and 2,700 MW on the distribution system. No new reliability or adequacy concerns are foreseen over the period from June 2011 to November 2012.

Surplus baseload generation (SBG) remains an ongoing concern for the IESO. As expected, the balancing of supply and demand during low load periods is a very fluid environment, with volatility in SBG amounts driven in large extent by the demand for electricity, the ability to export the surplus electricity and varying wind production.

Over the summer and into the fall of 2011, 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. Having maximum flexibility in all resources is key to successfully managing operations and costs and with wind becoming a mainline resource it needs to become dispatchable. Having this option available will help the IESO manage SBG when wind generation is high.

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 shutdown. To ensure the phase-out of coal is achieved by 2014, a number of infrastructure projects, including transmission improvements, are currently underway.

Over the forecast period, demand will be influenced by two opposing forces. Economic and population growth will promote higher electricity demand. Conversely, conservation programs and increased embedded generation capacity will act to reduce the need for grid- supplied electricity. The continued demand growth from the economic recovery is expected to lead to modest peak and energy demand increases throughout the forecast. Energy consumption is expected to grow by 0.5 per cent in 2011 and 1.9 per cent in 2012.

The following table summarizes the forecasted seasonal peak demand numbers.

Season	Normal Weather Peak (MW)	Extreme Weather Peak (MW)
Summer 2011	23,539	26,073
Winter 2011-12	22,495	23,765
Summer 2012	23,712	26,269

Conclusions & Observations

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

Demand Forecast

- Electricity demand growth over the forecast horizon will be driven by economic and population growth.
- The growth in electricity demand will be mitigated to some extent by conservation efforts from the Ontario Power Authority and electricity distributors.
- Additionally, some of the demand for electricity will be met by embedded generators. Over the forecast the amount of embedded generation is expected to show strong growth as a result of the province's renewable energy programs.
- The net result of these competing forces will be moderate growth in both peak and total electricity demand.
- 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 except for one week in the firm resource extreme weather scenario.
- The Bruce nuclear unit refurbishments are expected to be complete in Q1 and Q3 of 2012.
- York Energy Centre is expected to be in service Q3 of 2012

	Normal Weather Scenario	Extreme Weather Scenario
Planned Scenario	• There are no weeks where reserve is lower than required	• There are no weeks where reserve is lower than required
Firm Scenario	• There are no weeks where reserve is lower than required	• There is 1 week where 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.

- 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.

Operability

- A risk of surplus baseload generation (SBG) conditions is present in both of the summers of 2011 and 2012 at volumes similar to those seen in 2009 and 2010.
- The IESO is currently working to address potential future operability issues associated with the growing amount of renewable resources expected to come into service over the next few years.

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1.0 Introduction

This Outlook covers the 18-month period from June 2011 to November 2012 and supersedes the last Outlook released in February 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 December 2010. The economic outlook has been updated based on the most recent data. Actual weather and demand data for February, March and April have been included in the tables.

The weather scenarios were updated to reflect actual weather data for the period through to 2010. As well, the models were re-estimated and adjusted to more accurately reflect the current set of relationships governing demand, the economy, conservation and embedded generation.

2.2 Updates to Resources

The following changes are reported since the previous Outlook.

- Talbot Wind Farm (99 MW) came into service
- Halton Hills Generating Station's gas turbines capacity increased by 52 MW

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 March 29, 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 March 25, 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 March 29, 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 has been revised to better indicate potential SBG conditions by illustrating the range of weekly minimum demands rather than the absolute minimum weekly demand. The average weekly demand has 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 June 2011 to November 2012 and supersedes the previous forecast released in February 2011. Tables containing supporting information are contained in the 2011 Q2 Outlook Tables spreadsheet.

Electricity demand is expected to show limited growth over the remainder of 2011 before showing a little more strength in 2012. Ontario's energy-intense export industries will continue to be hampered by the low U.S. dollar. 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 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)
Summer 2011	23,539	26,073
Winter 2011-12	22,495	23,765
Summer 2012	23,712	26,269
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)	142.9	0.5%
2012 Energy (Forecast)	145.6	1.9%

Forecast Details

The companion document, the Ontario Demand Forecast, looks at demand in more detail. It contains the following:

- Details on the demand forecast
- Analysis of historical demand
- Discussion on the impact of the drivers affecting demand

The data contained in the Ontario Demand Forecast document are included in the 2011 Q2 Outlook Tables spreadsheet.

- 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 680 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.

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 May 4, 2011

Fuel Type	Total Installed Capacity (MW)	Forecast Capability at Summer Peak* (MW)	Number of Stations	Change in Installed Capacity (MW)	Change in Stations
Nuclear	11,446	11,249	5	0	0
Hydroelectric	7,947	5,809	71	0	0
Coal	4,484	4,267	4	0	0
Oil / Gas	9,549	7,914	28	52	0
Wind	1,334	189	10	99	1
Biomass / Landfill Gas	122	37	6	0	0
Total	34,882	29,466	124	151	1

* 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-Q2		Commissioning	78	78
Leamington Pollution Control Plant	West	Oil	2011-Q3		Construction		2
Becker Cogeneration (CHP III)	Northwest	Biomass	2011-Q3		Construction Suspended		15
McLean's Mountain Wind Farm 1 (FIT)	Northeast	Wind	2011-Q3		pre-NTP		50
McLean's Mountain Wind Farm 3 (FIT)	Northeast	Wind	2011-Q3		pre-NTP		10
Comber West - C23Z Wind Project (FIT)	West	Wind	2011-Q3		NTP		83
Comber East - C24Z Wind Project (FIT)	West	Wind	2011-Q3		NTP		83
Pointe Aux Roches Wind (FIT)	West	Wind	2011-Q3		pre-NTP		49
Nanticoke Units 1 and 2	Southwest	Coal	2011-Q4		0	-980	-980
Greenwich Wind Farm (RES III)	Northwest	Wind	2011-Q4		Construction		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
Bow Lake Phase 1 (FIT)	Northeast	Wind	2012-Q2		pre-NTP		20
Bruce Unit 1	Bruce	Uranium	2012-Q3		Construction		750
York Energy Centre	Toronto	Gas	2012-Q3		Construction		393
Total						**-902**	**1,596**

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%.

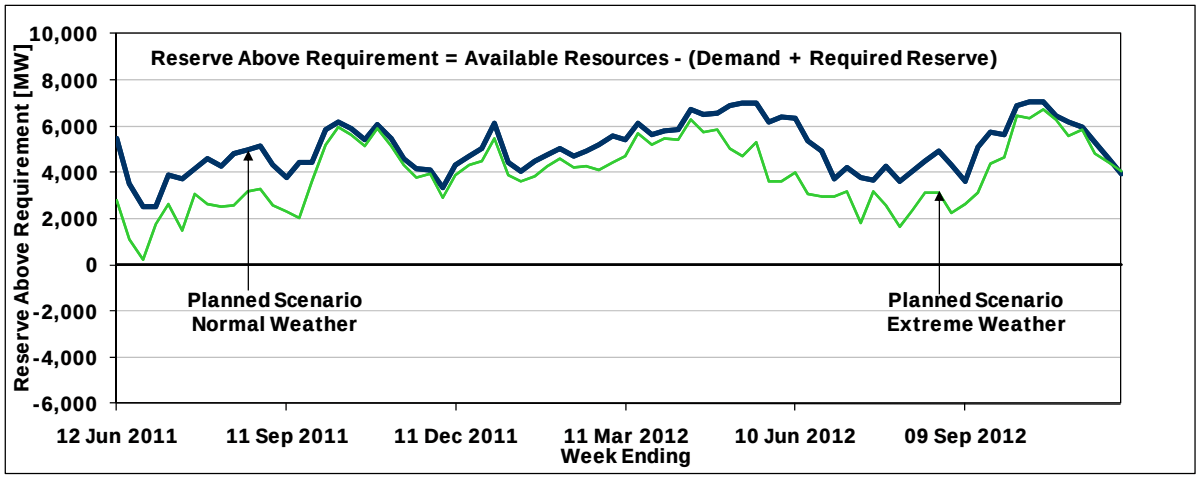
Table 4.3 Summary of Scenario Assumptions

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
		1,596	-902
Demand Forecast	Conservation	Incremental	
		Incremental growth of 125 MW on summer peak	
	Embedded Generation	Incremental	
		Incremental growth of 175 MW on summer peak	
	Demand Measures	Incremental	Existing
		1,206	850

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.

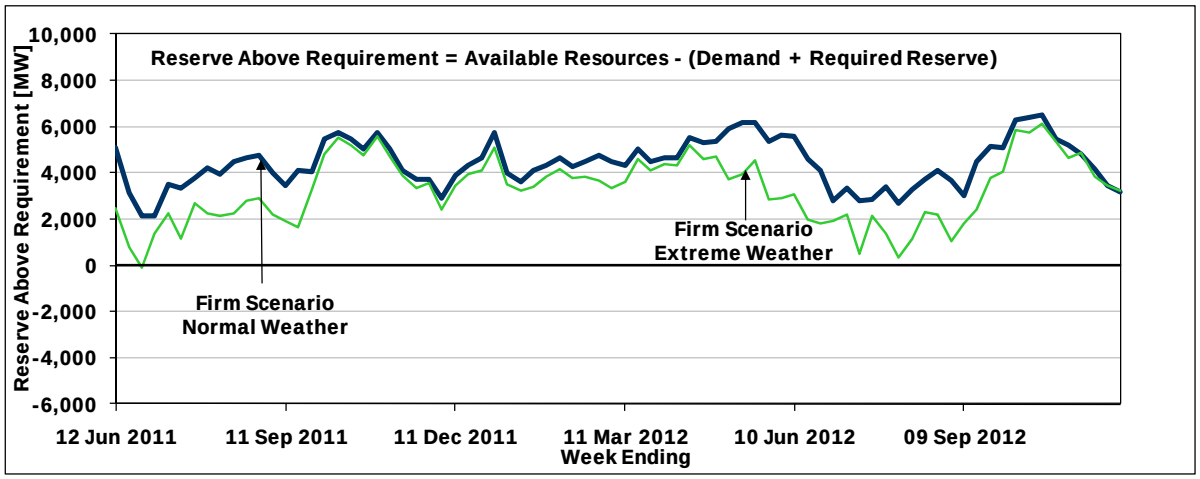
Figure 4.1 Reserve Above Requirement: Planned Scenario with Normal vs. Extreme Weather



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 Q2 Outlook Tables Appendix A, Table A7.

Table 4.4 Summary of Available Resources

Notes	Description	Summer Peak 2011		Winter Peak 2012		Summer Peak 2012	
		Firm Scenario	Planned Scenario	Firm Scenario	Planned Scenario	Firm Scenario	Planned Scenario
1	Installed Resources (MW)	34,960	34,960	33,980	34,439	33,980	35,334
2	Imports (MW)	0	0	0	0	0	0
3	Total Resources (MW)	34,960	34,960	33,980	34,439	33,980	35,334
4	Total Reductions in Resources (MW)	5,760	5,752	5,444	5,829	5,113	5,905
5	Demand Measures (MW)	850	1,206	850	1,195	850	1,351
6	Available Resources (MW)	30,050	30,414	29,386	29,805	29,717	30,780

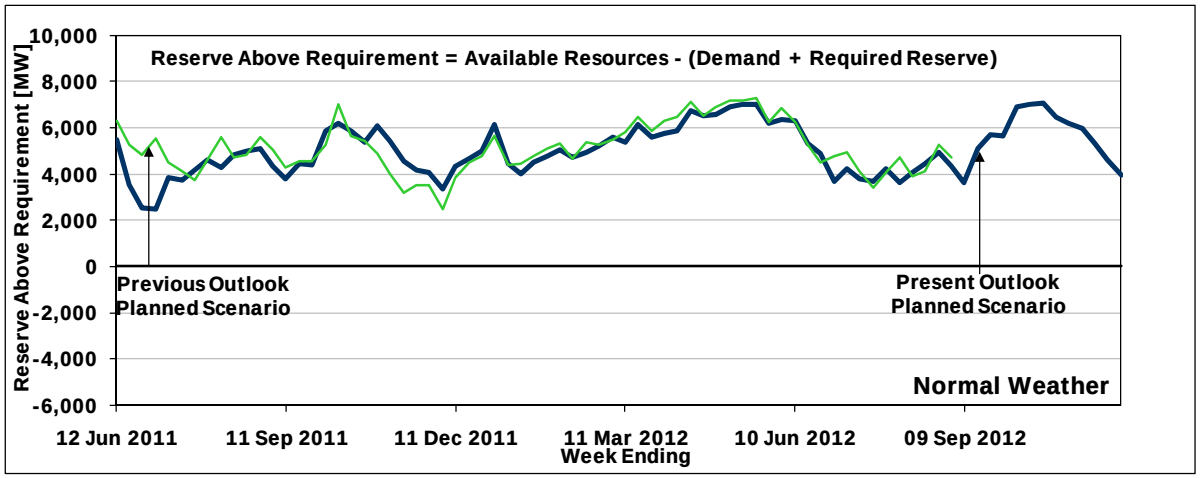
Notes to Table 4.4:

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 February 25, 2010. 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 provide significant improvement to system reliability. Minor transmission equipment replacements or refurbishments are excluded.

Even with the recent recession, some area loads 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. Where 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. Where 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 March 25, 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.

Hydro One is currently undertaking major upgrade work at Burlington TS which will resolve limitations in the station's ability to supply the Burlington 115 kV area load, allow future load growth and yield a more flexible configuration. The remaining work, which includes the replacement of all 115 kV breakers and limiting bus sections, is scheduled to be completed in the second quarter of 2013.

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, including a new generating facility, 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 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 small 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.

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

The transmission lines east of Mississagi TS and the north-south corridor have experienced increased congestion due to the continuing addition of new renewable resources and the lack of transmission reinforcements. It is expected that congestion will further increase with projects in the area, both proposed and under construction, becoming operational.

To help reduce this congestion and incorporate the future Lower Mattagami expansion projects and other renewable generation resources, Hydro One installed series compensation on the 500 kV north-south lines at Nobel SS and dynamic reactive compensation facilities at Porcupine TS. 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 second 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.

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. This past quarter, we have seen a number of instances of surplus baseload generation (SBG) mostly as a result of increased production due to spring freshet and mild temperatures. Instances of surplus conditions have the risk of increasing in the near future as spring freshet continues and temperatures become milder.

Figure 6.1 Minimum Demand and Baseload Generation

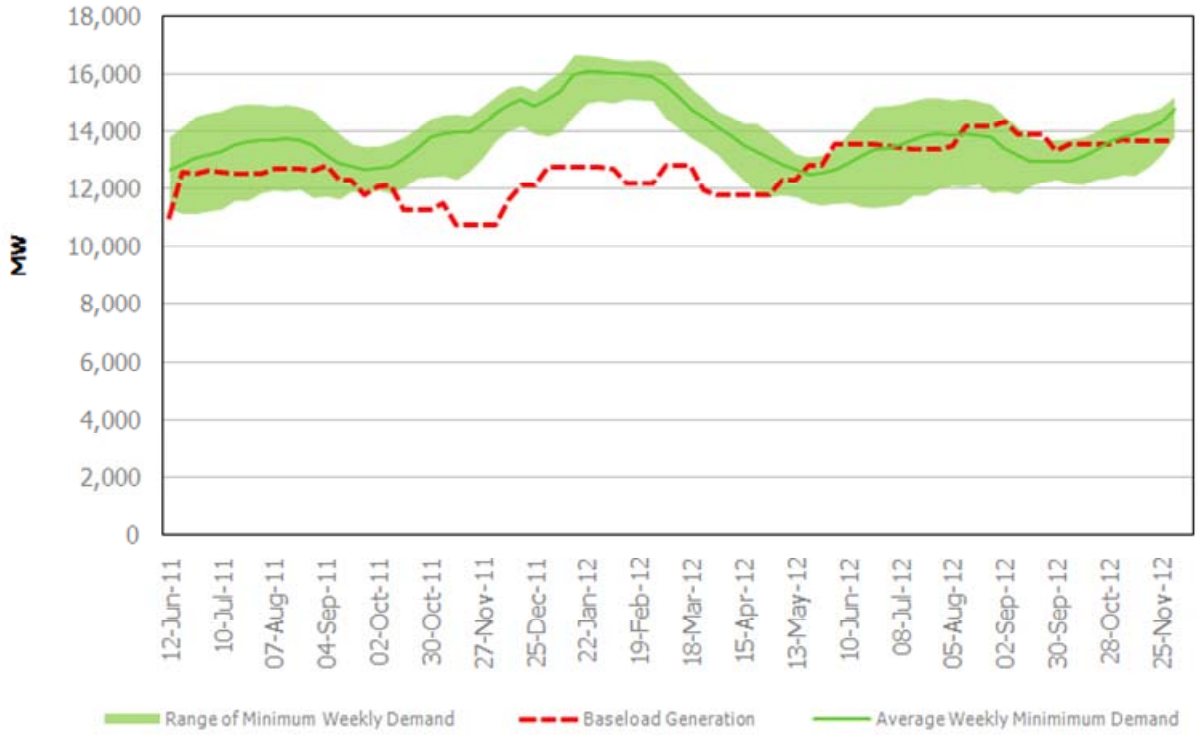


Figure 6.1 Baseload generation assumptions have been updated to include exports[1], the latest planned outage information, market participant submitted data, and in-service dates for new or refurbished generation. The expected contribution from self-scheduling and intermittent generation has also been 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.

SBG remains an ongoing concern for the IESO. There are a number of factors that contribute to SBG, over many of which we lack direct control: temperature, weather, consumption and market behaviour. 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. However,

[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.

a similar low demand period with no wind and a strong ability to export could 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.

As seen by the Ontario Electricity Financial Corporation's (OEFC) management of the Non-Utility Generators (NUGs), a willingness to alter output during times of surplus limits the use of out of market actions which is key to the efficiency of the Ontario electricity market. With wind and solar becoming such prominent resources on our system, the need for enhanced dispatch capability of these resources has become an integral need for the reliable and efficient operation of the grid. The IESO is currently considering policies and principles similar to those implemented in jurisdictions with comparable amounts of renewable generation and will be consulting with stakeholders through stakeholder engagement 91 (SE-91) to ensure that these are appropriate to meet Ontario's needs.

Over the summer and into the fall of 2011, 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 -

7.0 Historical Review

This section provides a review of past power system operation, including the most recent months of operation, to identify noteworthy observations, emerging problems and variations from forecast.

7.1 Weather and Demand Historic Review

Since the last full Outlook document was released actual demand and weather data have been reported for the past winter.

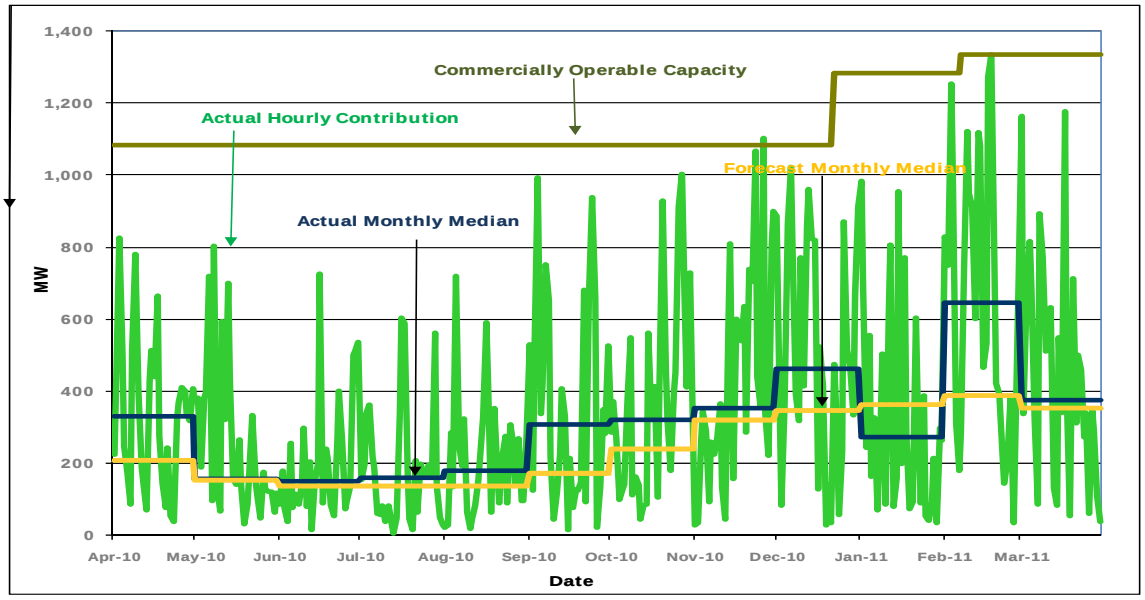
For the period November through April, the weather was generally colder than normal. In particular, the key winter months of December, January and February were all colder than normal. All months showed a year-over-year increase in demand. However most of the growth appears to be weather driven as after correcting for weather, only March and April have shown year-over-year increases. For the four months ending in April, actual demand is up 2.3% compared to 2010 (down 0.3% weather corrected). Demand is still 5.3% below that of the pre-recession levels of 2008 (5.5% weather corrected).

7.2 Hourly Resource Contributions at Time of Weekday Peak

The figures from 7.2.1 to 7.2.4 show the contributions made by wind generators, hydro generators, imports, and net interchange into Ontario at the time of weekday peak. The period analyzed is from April 1, 2010 to March 31, 2011. Holiday and weekend data were not considered in the analysis since hydro peaking generation and interchange data during this timeframe are not typical of time periods when Ontario's supply adequacy may be challenged.

Figure 7.2.1 indicates the amount of wind contribution to the wholesale market at the time of weekday peak, compared to the forecast contributions. The forecast methodology takes into account seasonal variances in wind patterns, among other factors. The median wind production over the fall of 2010 and winter of 2010/2011 is slightly higher than the forecast Wind Capacity Contribution (WCC) assumption. At the time, the WCC forecast was assumed to be approximately 11% of total installed capacity during the summer months. WCC values have now been updated and the summer values are now 13%. As for trending, it follows the prevalent wind speeds during each season. Installed wind capacity is also expected to grow with wind generation procured under the RES III and FIT programs.

Figure 7.2.1 Wind Contributions at the Time of Weekday Peak



Note: Commercially operable capacity does not include commissioning units. Therefore actual hourly contribution may exceed commercial capability.

Figure 7.2.2 indicates the amount of hydroelectric contributions to energy and operating reserve markets at the time of weekday peak, excluding weekends and holidays, compared to the forecasted contributions. The forecasted monthly median consists of the median contribution of hydroelectric energy at the time of weekday peak since 2002. The hydroelectric production at the hour of weekday peak for most of the 2010 spring months was lower than forecasted. This is primarily due to a decrease in precipitation levels from previous years. In addition, a relatively calm spring thaw (or freshet) was observed due to reduced snow and ice accumulation over the winter. We expect that hydro will increase and return to similar historical trending. As for the fall/winter months, the data generally coincided with expected levels of hydroelectric generation with the exception of October and November 2010.

Figure 7.2.2 Hydro Contributions (Energy and Operating Reserve) at the Time of Weekday Peak

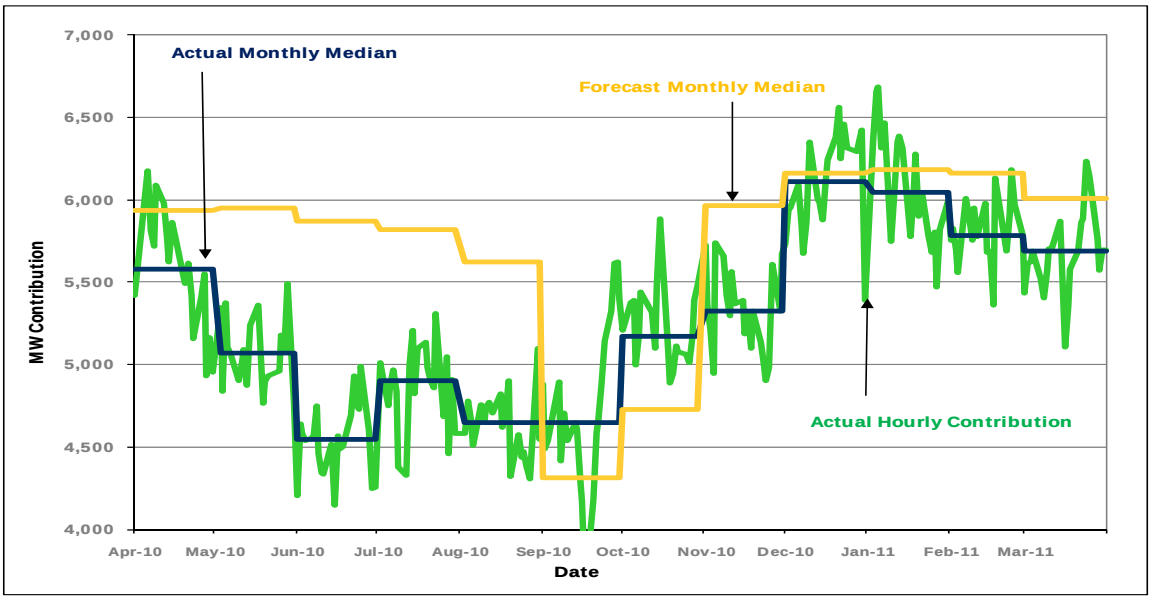


Figure 7.2.3 shows imports into Ontario at the time of weekday peak. Similar to the past year, Ontario followed its typical trend, attracting more imports during the relatively higher demand periods characteristic for the summer months. Average hourly imports during the fall/winter of 2010/2011 followed the same trend from a year ago.

Figure 7.2.3 Imports into Ontario at the Time of Weekday Peak

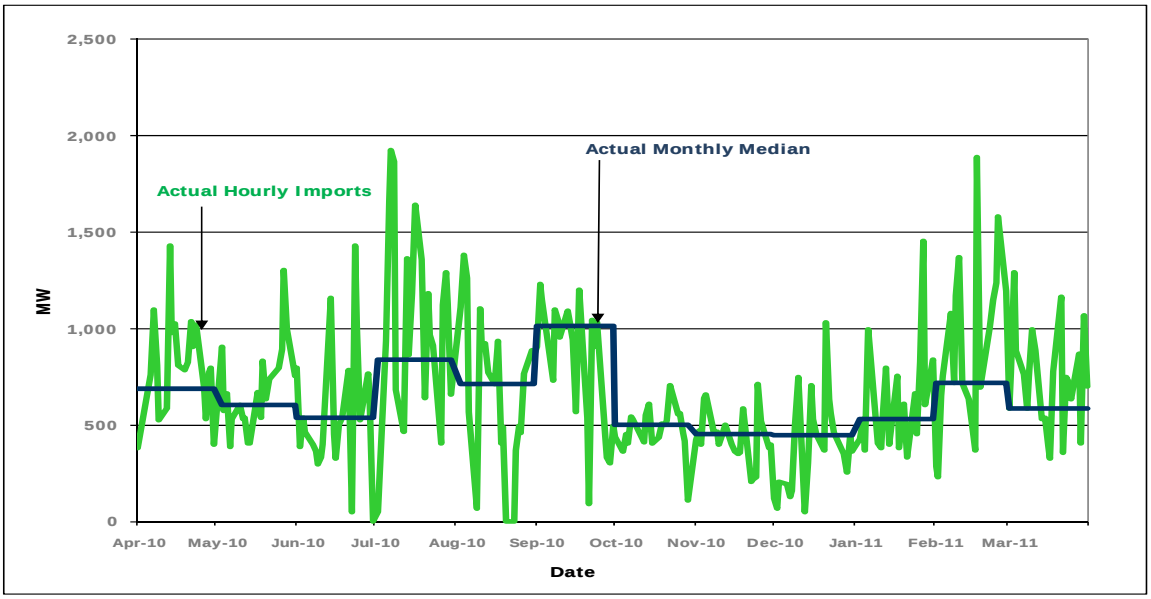
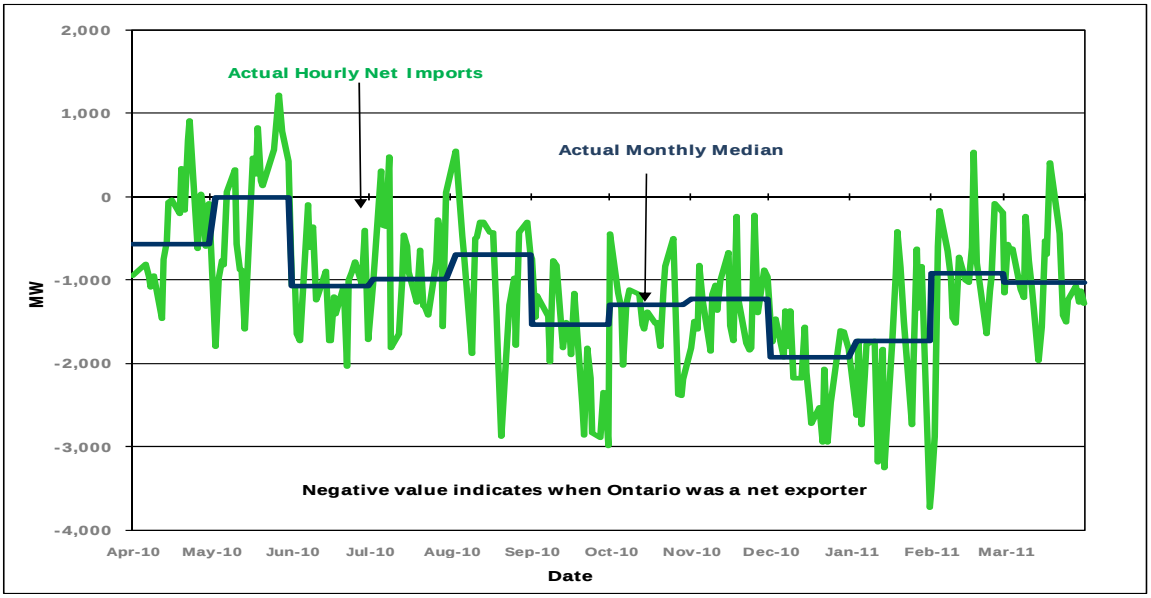


Figure 7.2.4 shows the amount of net imports into Ontario at the time of weekday peak, excluding weekends and holidays. Net Interchange is the difference between total imports into Ontario and total exports out of Ontario. An average net export position prevailed over the reporting time period. This can be attributed to the increased export capability with Quebec, and an increase in generator capacity over the previous years.

Figure 7.2.4 Net Interchange into Ontario at the Time of Weekday Peak



7.3 Report on Initiatives

Centralized forecasting for wind resources is an initiative designed to allow for better forecasting of energy production to ensure a more accurate unit commitment occurs. A centralized wind forecast will be developed for all resources with an installed capacity of 5 MW or greater, with implementation set for 2012. This initiative may be extended to other variable resources such as solar as their aggregate installed capacity becomes material.

A new management system was implemented in March 2011. This web-based interface uses the existing portal and will allow market participants to electronically submit outages to the IESO through an Application Programming Interface (API). This initiative will significantly improve the outage management process through better communications and transparency of information with market participants.

The Enhanced Day Ahead Commitment Process (EDAC) project is an ongoing initiative designed to enhance the efficiency of the electricity market through the advanced scheduling and commitment of resources that are required to provide electricity on a daily basis. The project is currently in the Market Trials phase when market participants assist the IESO in testing in order to demonstrate the readiness of the IESO, participant staff and systems. Testing of this phase commenced in May 2011 and will continue until fall 2011.

7.4 Variation from Previous Year

The biggest variation from the previous year is that in 2010 we saw lower hydroelectric production during the summer months. The major factor that contributed to this variation is the decrease in precipitation levels from previous years. We also saw an increase in wind capacity during the early months of 2011.

- End of Document -