

18-MONTH OUTLOOK

From June 2013 to November 2014



Executive Summary

Ontario is expected to continue to have adequate generation and transmission capability in the provincial power system. During the next 18 months, approximately 3,300 megawatts (MW) of wind, solar, hydro and biomass capacity are expected to be connected to the transmission grid, with a number of the operational changes needed to support this supply coming into force.

By the end of this outlook period, these new projects are anticipated to provide approximately 8.7 terawatt-hours (TWh) in energy output on an annual basis. By November 2014, the total wind and solar generation connected both to the transmission and distribution networks in Ontario are expected to exceed 6,800 MW and provide approximately 14.9 TWh of annual energy.

This summer, about 450 MW of renewable capacity is slated to come into service. However, more than 1,100 MW of new wind projects are expected to connect to the grid in the summer of 2014, which will be the largest influx of renewable capacity in a single season. By November 2014, total grid-connected annual wind output is expected to reach 10.9 TWh.

Solar generation – which up until now has only been embedded within distribution networks – will soon include nine new projects connected to the transmission grid, amounting to a total capacity of 180 MW. This capacity will complement the anticipated 1,700 MW of embedded solar capacity that will be in service during the outlook period.

To support these levels of new supply, the IESO's Renewable Integration Initiative (RII), continues to move forward to address three key elements – forecast, visibility and dispatch of renewable resources. RII initiatives have already yielded results, including the integration of the hourly centralized forecast into the IESO scheduling tools and enhanced visibility of renewable output within the IESO Control Room which will provide greater levels of awareness of system conditions.

The dispatch of grid-connected renewable resources is planned to be in place by this fall. This initiative will provide increased flexibility from available variable generation resources and will allow the IESO to operate the system more efficiently. Although, solar dispatch will be enabled at the same time as wind, it is not expected until early 2014 as grid connected solar resources come on line.

Coal-fired generation in Ontario is in the final stages of the shutdown process. The remaining generating units at Lambton and Nanticoke are scheduled to stop burning coal by the end of 2013, in line with government policy. The conversion of Atikokan generating station from a coal-fired unit to biomass is underway, with the unit expected to be back in service by the third quarter of 2014. The loss of these facilities results in a considerable but acceptable reduction in resources as seen in the summer 2014 resource scenarios depicted within the report.

Energy demand is forecast to decrease by 0.4% in 2013. The increase in electricity demand from modest economic and population growth will be more than offset by growth in embedded generation capacity, which reduces bulk power system demand, along with on-going conservation initiatives.

Peak demands are also impacted by these same factors plus a few more. The projected growth in embedded solar capacity will have a significant impact on the apparent summer peak. Contributions from distribution-connected solar resources will effectively reduce demand for grid-supplied energy. Additionally, price impacts like time-of-use rates and the Global Adjustment Allocation will continue to have an effect on peak demands, leading to a decline in summer peaks and a slight increase in winter peaks. The following table summarizes the forecasted seasonal peak demand numbers.

Season	Normal Weather Peak (MW)	Extreme Weather Peak (MW)
Summer 2013	23,213	25,368
Winter 2013-14	22,239	23,297
Summer 2014	22,937	24,954

Ontario will continue to experience an increase in volume, frequency and duration of surplus baseload generation (SBG) conditions with declining wholesale demand for electricity and significant quantities of baseload generation on the system. A vast majority of SBG is being managed via IESO tools and processes such as managing exports and nuclear maneuvering. In the first three weeks of May, nuclear units were shut down on three occasions in response to surplus conditions. The IESO will gain another tool to help manage SBG in September 2013 as wind becomes a dispatchable resource, which will help manage this increase in SBG.

Conclusions & Observations

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

Demand Forecast

- Ontario's energy demand is expected to decline in 2013 by 0.4%. Increased demand due to economic expansion and population growth will be offset by growth in embedded generation capacity and on-going conservation initiatives. These factors reduce bulk power system demand. Since, 2012 was a leap year, the additional day bumped energy demand growth by 0.3% in 2012 and thus, 2013 shows a corresponding 0.3% reduction in energy demand.
- The growth in embedded solar and wind capacity will put significant downward pressure on overall energy demand and summer peak demands from the bulk electric system. Combined with conservation, Global Adjustment impacts and time-of-use rates, summer peaks are expected to decline and winter peaks are expected to show a slight increase over the 18-month time horizon.
- Although high 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 the weather scenarios.
- Lambton and Nanticoke coal generating units will be removed from the grid by the end of 2013.
- The Lower Mattagami expansion project is underway which is expected to add more than 400 MW of hydro generation in Northeast Ontario. The first phase of this project is the addition of a third unit at Little Long Generating Station, with 70 MW capacity, which is expected to be in service by end of Q2 2014.
- Approximately 3,300 megawatts (MW) of grid-connected renewable capacity will be added to the grid throughout this outlook period, which includes about 180 MW of grid-connected solar capacity in Ontario.
- During the summer months of 2013, about 450 MW of renewable capacity is expected to be added to Ontario's supply. However, the largest influx of new wind generation capacity in a single season will take place the following summer, with more than 1,100 MW of new wind projects connecting to the grid.
- Decisions around the possible Pickering unit retirements and associated transmission upgrades are required within the timeframe of this Outlook to ensure supply adequacy continues beyond 2014.

	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

- Ontario's transmission system is expected to reliably supply the demand under the normal and extreme weather conditions forecast for this Outlook period.
- The IESO, OPA, Transmitters and affected distributors are reviewing system needs and considering solutions under the Regional Planning Process established by the Ontario Energy Board (OEB).
- 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](#), will help relieve loadings of existing transmission stations and provide additional supply capacity for future load growth.
- To help control voltages in northwestern Ontario, Hydro One will be installing new reactors. Reactors at Marathon are scheduled to be installed and in service by Q4 2013 and reactors at Dryden are scheduled for Q4 2014.
- The IESO, Hydro One and OPA are also considering long term solutions to help control high voltages in southern Ontario during low demand periods.
- To improve the transmission capability into the Guelph area, Hydro One will be proceeding with the Guelph Area Transmission Refurbishment project to reinforce the supply into Guelph-Cedar TS, with an expected completion date in the second quarter of 2016.
- In the Cambridge area, to help meet the IESO's load restoration criteria following a contingency, a second 230/115 kV autotransformer is expected to be installed at Preston TS. Longer-term solutions to fully address meeting restoration criteria are being developed.
- Transmission enhancements at Manby TS, which include 230kV switchyard reconfiguration and breaker upgrades are planned for Q4 2014. Hydro One has also planned to upgrade 115kV breakers at Hearn and Leaside by Q4 2014. These upgrades will help manage long-term load supply in the south-western GTA.
- In the eastern portion of the GTA, a new Clarington TS that provides 500/230 kV transformation and 230 kV switching facilities is scheduled to be in-service as soon as spring 2015 to maintain supply reliability beyond Pickering end-of-life. Clarington TS will also improve restoration capability to the loads in the Pickering, Ajax, Whitby, Oshawa and

Clarington areas so that IESO's load restoration criteria following transmission outages will be satisfied.

Operability

- The IESO continues to approach the completion of its RII. RII initiatives have already yielded results, including the integration of the hourly centralized forecast into the IESO scheduling tools and enhanced visibility of renewable output within the IESO Control Room which will provide greater levels of awareness of system conditions. The dispatch of grid-connected renewable resources is planned to be in place within the forecast period.
- By the end of 2013, a 5-minute forecast for variable generation, wind and solar, is expected to be introduced into the real-time scheduling process and variable resources themselves will become fully dispatchable.
- The conditions for surplus baseload generation are likely to continue to grow in 2013 and 2014, following the recent nuclear unit restarts and with the expected increased penetration of renewable generation, combined with lower off-peak demand for electricity. A vast majority of SBG is being managed via IESO tools and processes such as nuclear maneuvering and managing exports. The IESO will gain another tool to help manage SBG by fall of 2013 as wind becomes a dispatchable resource, and helps to maintain operational efficiency.

Caution and Disclaimer

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Table of Contents

Executive Summary	iii
Conclusions & Observations.....	v
Table of Contents.....	ix
List of Tables.....	x
List of Figures	x
1 Introduction	1
2 Updates to This Outlook	2
2.1 Updates to Demand Forecast.....	2
2.2 Updates to Resources.....	2
2.3 Updates to Transmission Outlook.....	2
2.4 Updates to Operability Outlook	2
3 Demand Forecast	3
3.1 Actual Weather and Demand	5
3.2 Forecast Drivers.....	6
4 Resource Adequacy Assessment.....	8
4.1 Committed and Contracted Generation Resources	8
4.2 Summary of Scenario Assumptions.....	10
4.3 Firm Scenario with Normal and Extreme Weather	11
4.4 Planned Scenario with Normal and Extreme Weather	12
4.5 Comparison of Resource Scenarios.....	13
5 Transmission Reliability Assessment.....	15
5.1 Transmission and Load Supply Projects	15
5.2 Transmission Outages	15
5.3 Transmission System Adequacy	15
6 Operability Assessment	19
6.1 Surplus Baseload Generation (SBG).....	19
7 Historical Review	22
7.2 Hourly Resource Contributions at Time of Weekday Peak	22
7.3 Report on Initiatives.....	26

List of Tables

Table 3.1 Forecast Summary	4
Table 3.2 Weekly Energy and Peak Demand	5
Table 4.1 Existing Generation Resources as of April 15, 2013	8
Table 4.2 Committed and Contracted Generation Resources	9
Table 4.3 Summary of Scenario Assumptions for Resources.....	11
Table 4.4 Summary of Scenario Assumptions for Normal Weather Demand	11

List of Figures

Figure 4.1 Reserve Above Requirement: Firm Scenario with Normal vs. Extreme Weather	12
Figure 4.2 Reserve Above Requirement: Planned Scenario with Normal vs. Extreme Weather	12
Figure 4.3 Reserve Above Requirement: Planned Scenario with Present Outlook vs. Previous Outlook	14
Figure 6.1.1 MWh Curtailments for SBG versus Ontario Demand	20
Figure 6.1.2 Minimum Ontario Demand and Baseload Generation (includes Net Export assumption)	21
Figure 7.2.1 Wind Contributions at the Time of Weekday Peak	23
Figure 7.2.2 Hydro Contributions (Energy and Operating Reserve) at the Time of Weekday Peak.....	24
Figure 7.2.3 Imports into Ontario at the Time of Weekday Peak	25
Figure 7.2.4 Net Interchange into Ontario at the Time of Weekday Peak	26

1 Introduction

This Outlook covers the 18-month period from June 2013 to November 2014 and supersedes the last Outlook released in February 2013.

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:

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

2 Updates to This Outlook

2.1 Updates to Demand Forecast

The demand forecast is based on actual demand, weather and economic data through to the end of February 2013. The demand forecast has been updated to reflect the most recent economic projections and data. Actual weather and demand data for March 2013 and April 2013 have been included in the tables.

2.2 Updates to Resources

Lambton and Nanticoke Generating Stations will be shut down by the end of 2013.

Point Aux Roches Wind Energy Centre is in service and its generating capacity of 48.6 MW has been added to the resources. The new Niagara Tunnel is in-service producing more renewable electricity at the Sir Adam Beck generating complex.

Nine grid-connected solar projects are expected to come in-service during the outlook period, adding a total of 180 MW to Ontario's supply mix. Monthly solar capacity contribution values are used to forecast the capacity contributions at the time of weekday peak for these solar projects. The value used in the summer months is 34% and in winter months is 0%. In summer, the peak demand hour mostly coincides with the higher production from the solar panels, whereas in winter the peak demand hour occurs after sunset.

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 April 15, 2013.

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 April 1, 2013 were used.

2.4 Updates to Operability Outlook

The outlook for surplus baseload generation (SBG) conditions over the next 18 months uses planned generator outages as submitted by market participants to the IESO's IOMS. This Outlook is based on submitted generation outage plans as of April 15, 2013.

- End of Section -

3 Demand Forecast

The IESO is responsible for forecasting electricity demand on the IESO-controlled grid. This demand forecast covers the period June 2013 to November 2014 and supersedes the previous forecast released in March 2013. Tables of supporting information are contained in the 2013 Q2 Outlook Tables spreadsheet.

Energy demand is forecast to decrease by 0.4% in 2013. This reduction is the combination of a number of effects. Increased embedded generation production, conservation initiatives and the impact of the loss of a day compared to last year being a leap year, all act to reduce the growth rate of grid supplied electricity. Increased demand is generally driven by economic expansion and population growth. Though population growth remains steady, economic expansion has been quite modest. Additionally, economic growth has and will continue to be centered in areas of the economy which have low levels of electric intensity. The traditionally electricity intense industries have seen mixed results since the 2009 recession.

Summer peak demands will face downward pressure from a number of factors. The projected growth in embedded solar capacity, conservation, time of use rates and the Global Adjustment Allocation will have a significant impact on the grid supplied summer peak. Contributions from distribution-connected solar resources will supplant grid-supplied electricity. Conservation reduces the overall need for electricity and price impacts lead electricity customers to shift their usage to non-peak periods. Combined these impacts will act to reduce summer peaks going forward. Conversely, these factors are weaker or absent during the winter peak periods. The winter peak occurs after sundown so it not impacted by embedded solar. Unlike the summer peak which is primarily electric air conditioner load and impacted by changes to air conditioner efficiency, the winter peak load is a mix of end-uses, with the greatest conservation impacts coming from lighting efficiency gains. The price impacts are also muted as the Global Adjustment Allocation has only applied to summer peaks so far. Winter peaks will show a slight increase over the forecast.

The following tables show 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 2013	23,213	25,368
Winter 2013-14	22,239	23,297
Summer 2014	22,937	24,954
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	141.2	-0.6%
2012 Energy	141.8	0.4%
2013 Energy (Forecast)	141.2	-0.4%

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)
09-Jun-13	19,461	23,068	1,298	2,598	09-Mar-14	20,045	21,401	531	2,872
16-Jun-13	20,482	24,060	1,298	2,670	16-Mar-14	19,030	20,569	649	2,781
23-Jun-13	21,127	24,561	749	2,690	23-Mar-14	18,433	19,751	611	2,674
30-Jun-13	22,499	24,533	876	2,807	30-Mar-14	18,513	20,271	569	2,702
07-Jul-13	22,567	24,247	770	2,708	06-Apr-14	17,855	19,780	567	2,641
14-Jul-13	23,213	25,368	1,003	2,842	13-Apr-14	17,586	19,157	471	2,563
21-Jul-13	23,006	24,554	889	2,847	20-Apr-14	17,132	17,901	496	2,471
28-Jul-13	22,561	24,240	926	2,790	27-Apr-14	16,999	17,778	531	2,469
04-Aug-13	22,534	24,750	1,050	2,810	04-May-14	17,513	19,637	721	2,473
11-Aug-13	22,360	25,165	930	2,794	11-May-14	17,654	19,953	849	2,451
18-Aug-13	21,641	24,340	954	2,751	18-May-14	18,526	21,974	845	2,479
25-Aug-13	21,521	23,939	817	2,737	25-May-14	18,922	22,094	1,175	2,431
01-Sep-13	21,457	23,697	1,233	2,748	01-Jun-14	18,943	22,327	1,330	2,511
08-Sep-13	20,405	22,878	1,464	2,619	08-Jun-14	19,865	23,383	1,292	2,627
15-Sep-13	19,460	22,340	1,243	2,530	15-Jun-14	20,711	23,796	1,055	2,670
22-Sep-13	19,237	21,075	622	2,555	22-Jun-14	21,565	24,048	835	2,754
29-Sep-13	18,751	19,768	784	2,553	29-Jun-14	22,318	24,315	754	2,758
06-Oct-13	17,754	18,293	537	2,508	06-Jul-14	22,513	24,075	1,016	2,703
13-Oct-13	17,548	17,809	733	2,494	13-Jul-14	22,937	24,954	814	2,787
20-Oct-13	17,473	17,938	839	2,495	20-Jul-14	22,776	23,905	838	2,736
27-Oct-13	18,347	18,558	585	2,582	27-Jul-14	22,140	24,128	1,035	2,819
03-Nov-13	18,294	18,602	487	2,577	03-Aug-14	22,120	24,378	841	2,795
10-Nov-13	19,283	19,340	437	2,635	10-Aug-14	21,582	24,573	958	2,661
17-Nov-13	19,384	20,021	532	2,690	17-Aug-14	21,488	23,656	985	2,671
24-Nov-13	19,906	20,427	708	2,758	24-Aug-14	21,465	23,320	1,362	2,709
01-Dec-13	20,278	20,939	550	2,793	31-Aug-14	20,461	22,675	1,413	2,614
08-Dec-13	20,718	22,027	677	2,871	07-Sep-14	18,975	22,355	1,370	2,453
15-Dec-13	21,281	22,120	496	2,912	14-Sep-14	18,755	21,002	680	2,454
22-Dec-13	21,392	22,298	585	2,938	21-Sep-14	18,600	19,717	781	2,515
29-Dec-13	19,304	20,524	755	2,697	28-Sep-14	17,727	17,777	420	2,464
05-Jan-14	20,739	21,438	353	2,854	05-Oct-14	17,099	17,422	554	2,481
12-Jan-14	22,239	23,297	570	3,068	12-Oct-14	17,357	17,649	786	2,524
19-Jan-14	21,699	22,649	547	3,014	19-Oct-14	18,079	18,265	507	2,509
26-Jan-14	21,826	22,649	483	3,026	26-Oct-14	18,064	18,281	392	2,576
02-Feb-14	21,902	22,579	404	3,062	02-Nov-14	18,652	18,842	318	2,621
09-Feb-14	21,077	22,364	734	3,012	09-Nov-14	18,898	19,437	416	2,638
16-Feb-14	20,666	22,167	635	2,927	16-Nov-14	19,465	19,914	601	2,703
23-Feb-14	20,438	22,028	581	2,892	23-Nov-14	19,944	20,496	342	2,754
02-Mar-14	20,999	21,954	501	2,961	30-Nov-14	20,456	21,401	607	2,805

3.1 Actual Weather and Demand

Since the last forecast the actual demand and weather data for February, March and April have been recorded.

February

- The weather for February was very close to normal. Demand for the month was 11.7 TWh (11.7 TWh weather-corrected). This is a decrease compared to the previous February but after adjusting for the extra day in 2012 demand would have been higher this February. The monthly peak was 21,426 MW and occurred on February 4th, which wasn't the coldest day, but was during a cold snap starting the month before. This weather corrected peak was an almost identical 21,451 MW.

- Despite having one less day, wholesale customers' consumption increased by 7.1% over the previous February. Wholesale customers' consumption has shown strong year over year increases since September.

March

- March's weather was near normal. The average temperature was normal, though the peak temperatures were milder than normal. Energy demand for the month was 12.0 TWh (11.8 TWh weather-corrected). The peak day did not occur on the coldest day as those days occurred on a weekend. The peak was on the Monday following. The 19,825 MW peak was lower than the previous March.
- Wholesale customers' consumption growth weakened in March growing by just 1.8% over the previous March. Over the previous five months year over year growth had averaged 6.7%.

April

- The weather for April was fairly close to normal. Actual energy demand for the month was 10.9 TWh (11.0 TWh weather-corrected) which is an increase over the previous April. The actual peak for the month was 18,854 MW and occurred on April 3rd which makes the peak a cold weather peak. The peak was lower than the previous April's.
- Wholesale customers' consumption growth was much weaker for the second consecutive month. Their consumption growth had been strong for five months, averaging 6.7%. However year over year growth for April was just 0.1%.

Weather-corrected demand was down 0.3% for the first four months of 2013 compared to the previous year. However, after adjusting for the impact of the additional leap year day demand would have risen 0.6%. Unfortunately, recent economic data and forecast points to lower expansion throughout the remainder of 2013 meaning lower demand growth later in the year.

The [2013 Q2 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 economic outlook has not changed appreciably since the recession. High debt loads, high unemployment rates and weak economic growth are the stories for most of the western economies. Low borrowing costs and stimulus spending has not given traction to the recovery. Canada's economy had fared much better than other nations due to lower debt levels, high commodity prices and a fairly robust real estate market. However, as a trade based nation, Canada is not insulated from global economic events and signs are pointing for weaker growth.

- Table 3.3.4 of the [2013 Q2 Outlook Tables](#) has the economic assumptions for the demand forecast.

Weather Scenarios

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 [2013 Q2 Outlook Tables](#) has the weekly weather data for the forecast period.

Conservation, Demand Management and Pricing

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

Other 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.

The impact of time of use rates and the Global Adjustment allocation are factored into the demand forecasts.

- End of Section -

4 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 may help to reduce surpluses of reserves.

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 April 15, 2013

Fuel Type	Total Installed Capacity (MW)	Forecast Capability at Summer Peak* (MW)	Number of Stations	Change in Installed Capacity (MW)	Change in Stations
Nuclear	12,998	12,844**	5	0	0
Hydroelectric	7,939	5,718	70	0	0
Coal	3,293	3,018	3	0	0
Oil / Gas	9,987	8,925	29	0	0
Wind	1,560	213	13	49	1
Biomass / Landfill Gas	122	90	6	0	0
Total	35,899	30,808	126	49	1

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

** Output of certain nuclear units may be limited due to environmental variances

4.1 Committed and Contracted Generation Resources

All generation projects that are scheduled to come into service, be upgraded, or be shut down within the Outlook period are summarized in Table 4.2. This includes both the generation projects in the IESO's Connection Assessment and Approval Process (CAA) that are under construction and the 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/conassess/ca.asp> under Application Status.

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 when existing capacity will be 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)
Comber Wind Limited Partnership	West	Wind			Commercial Operation	166	166
Thunder Bay Condensing Turbine Project	Northwest	Biomass	2013-Q2		Commissioning	40	40
Summerhaven Wind Energy Centre	Southwest	Wind	2013-Q2		Construction	125	125
Conestogo Wind Energy Centre 1	Southwest	Wind	2013-Q2		Pre-NTP	69	69
McLean's Mountain Wind Farm	Northeast	Wind	2013-Q2		NTP	60	60
Becker Cogeneration Plant	Northwest	Biomass	2013-Q4		Construction		8
Lambton Coal Shutdown	West	Coal	2013-Q4			-1,016	-1,016
Nanticoke Coal Shutdown	Southwest	Coal	2013-Q4			-1,985	-1,985
Leamington Pollution Control Plant	West	Oil	2014-Q1		Construction		2
Bow Lake Phase 1	Northeast	Wind	2014-Q1		pre-NTP		20
Dufferin Wind Farm	Southwest	Wind	2014-Q1		Pre-NTP		100
Twin Falls	Northeast	Water	2014-Q1		Construction		5
Niagara Region Wind Farm	Southwest	Wind	2014-Q1		Pre-NTP		230
Nigig Power Corporation	Essa	Wind	2014-Q1		Pre-NTP		300
Port Dover and Nanticoke Wind Project	Southwest	Wind	2014-Q1		Pre-NTP		104
Haldimand Solar Project	Southwest	Solar	2014-Q1		Pre-NTP		100
Haldimand Wind Project	Southwest	Wind	2014-Q1		Pre-NTP		150
South Kent Wind Project	West	Wind	2014-Q1		Construction		270
New Third Unit at Little Long	Northeast	Water	2014-Q2		Pre-NTP		71
Amherst Island Wind Project	East	Wind	2014-Q2		Pre-NTP		75
Goulais Wind Farm	Northeast	Wind	2014-Q2		pre-NTP		25
Bow Lake Phase 2	Northeast	Wind	2014-Q2		pre-NTP		40
Adelaide Wind Power Project	West	Wind	2014-Q3		Pre-NTP		40
Bornish Wind Energy Centre	Southwest	Wind	2014-Q3		Pre-NTP		74
Grand Bend Wind Farm	Southwest	Wind	2014-Q3		Pre-NTP		100
Grand Valley Wind Farms (Phase 3)	Southwest	Wind	2014-Q3		Pre-NTP		40
East Lake St. Clair Wind	West	Wind	2014-Q3		Commissioning		99
Erieau Wind	West	Wind	2014-Q3		Commissioning		99
Gunn's Hill Wind Farm	West	Wind	2014-Q3		Pre-NTP		25
Silvercreek Solar Park	West	Solar	2014-Q3		Pre-NTP		10
Cedar Point Wind Power Project Phase II	Southwest	Wind	2014-Q3		Pre-NTP		100
Adelaide Wind Energy Centre	Southwest	Wind	2014-Q3		Pre-NTP		60
Bluewater Wind Energy Centre	Southwest	Wind	2014-Q3		Pre-NTP		60
Goshen Wind Energy Centre	Southwest	Wind	2014-Q3		Pre-NTP		102
Jericho Wind Energy Centre	Southwest	Wind	2014-Q3		Pre-NTP		150
Gitchi Animki Bezhig Generating Station	Northwest	Water	2014-Q3		NTP		9
Gitchi Animki Niizh Generating Station	Northwest	Water	2014-Q3		NTP		10
Atikokan conversion to biomass	Northwest	Biomass	2014-Q3		Construction		205
White Pines Wind Farm	East	Wind	2014-Q3		Pre-NTP		60
Liskeard 1	Northeast	Solar	2014-Q3		NTP		10
Liskeard 3	Northeast	Solar	2014-Q3		NTP		10
Liskeard 4	Northeast	Solar	2014-Q3		NTP		10
Northland Power Solar Abitibi	Northeast	Solar	2014-Q3		Pre-NTP		10
Northland Power Solar Empire	Northeast	Solar	2014-Q3		Pre-NTP		10
Northland Power Solar Long Lake	Northeast	Solar	2014-Q3		Pre-NTP		10
Northland Power Solar Martin's Meadows	Northeast	Solar	2014-Q3		Pre-NTP		10
Total						-2,541	271

Notes on Table 4.2:

- The total may not add up due to rounding. Total does not include in-service facilities.
- Project status provides an indication of the project progress. The milestones used are:
 - Connection Assessment - the project is undergoing an IESO system impact assessment
 - Approvals & Permits - the proponent is acquiring major approvals and permits required to start construction (e.g. environmental assessment, municipal approvals etc.)
 - Construction - the project is under construction
 - Commissioning - the project is undergoing commissioning tests with the IESO
 - Pre-NTP/NTP - Feed-in Tariff (FIT) projects are categorized as Notice to Proceed (NTP) or 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.
 - Commercial Operation – the project has achieved commercial operation under OPA criteria.

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 Tables 4.3 and 4.4.

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 typically based on median historical values during weekday peak demand hours from May 2002 to March 2013. Adjustments may be made, periodically, when outage or water conditions drive expectations of higher or lower output that varies from median values by more than 500 MW. Manual adjustments to affected months have been made during this outlook period to account for specific scheduled hydroelectric outages and low water conditions.
- 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 are used at the time of weekday peak, while annual energy contribution is assumed to be 29% of installed wind capacity. For solar generation, the monthly Solar Capacity Contribution (SCC) values are used at the time of weekday peak. For annual solar energy contribution however, 14% output of installed capacity is assumed. The specifics on wind and solar values can be found in the [Methodology to Perform Long Term Assessments](#).

Table 4.3 Summary of Scenario Assumptions for Resources

		Planned Scenario	Firm Scenario
Over the 18-Month Period	Total Existing Installed Resource Capacity (MW)	35,899	
	New Generation and Capacity Changes (MW)	All Projects	Generator shutdowns or retirements, Commissioning Generators and Generators starting in the first 3 months
		271	-2,541

The Firm and Planned Scenarios also differ in their assumptions regarding the amount of demand measures.

Table 4.4 Summary of Scenario Assumptions for Normal Weather Demand

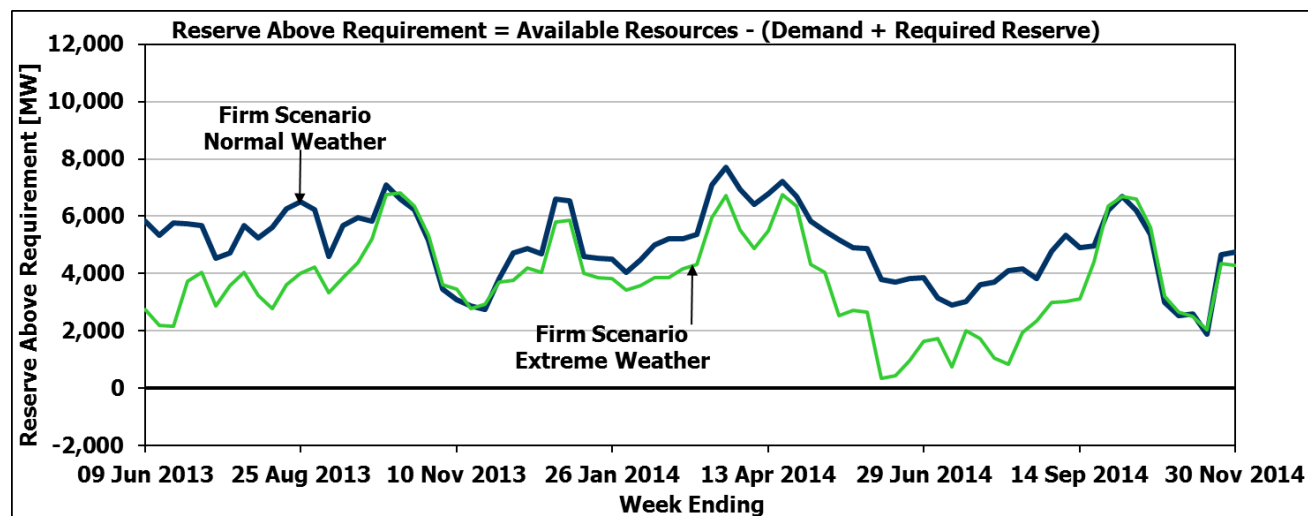
		Planned Scenario	Firm Scenario
2013 Summer Peak vs. 2012 Summer Peak	Growth in Conservation at Peak (MW)	57	
	Growth in Embedded Generation Capacity at Peak (MW)	530	
	Demand Measures Effective Capacity at Peak (MW)	Existing + Incremental	Existing
		549	549
	Ontario Demand at Peak (MW)	23,213	

4.3 Firm Scenario with Normal and Extreme Weather

The firm scenario incorporates capacity coming in service in the first three months of the Outlook period and generation being removed from service during the 18 months. This will include the addition of 420 MW of wind and 40 MW of biomass capacity.

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: Firm Scenario with Normal vs. Extreme Weather

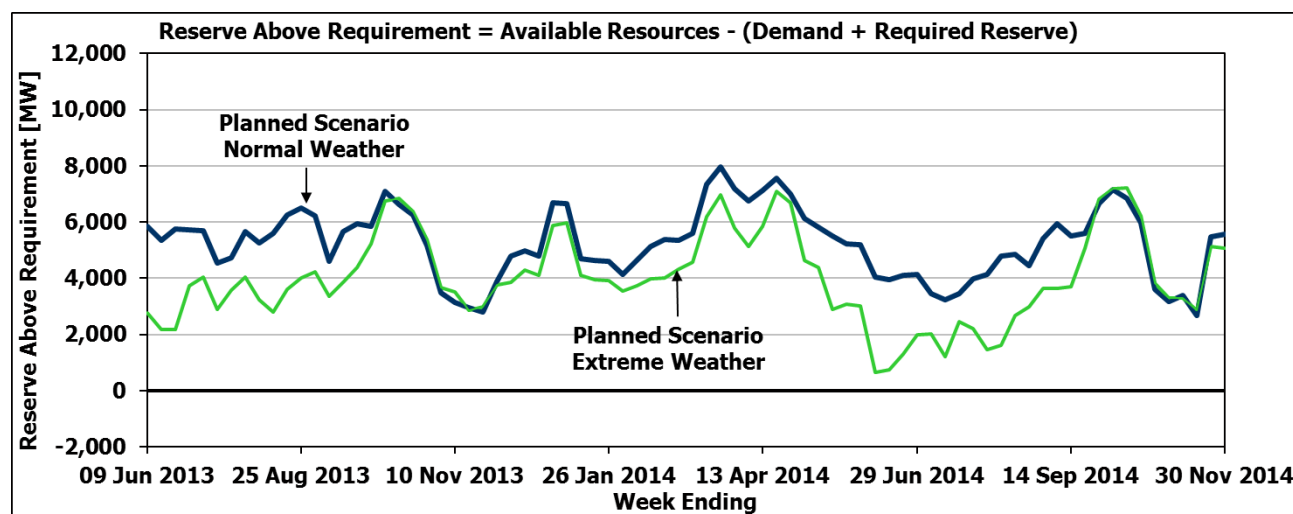


4.4 Planned Scenario with Normal and Extreme Weather

The planned scenario incorporates all capacity coming in service and being removed from service over the Outlook period. This will include the capacity changes in the firm scenario as well as approximately 3,300 MW of grid-connected renewables added to the system. The loss of coal-fired facilities results in a considerable but acceptable reduction in resources.

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: Planned Scenario with Normal vs. Extreme Weather



4.5 Comparison of Resource Scenarios

Table 4.5 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 [2013 Q2 Outlook Tables](#) Appendix A, Table A7.

Table 4.5 Summary of Available Resources

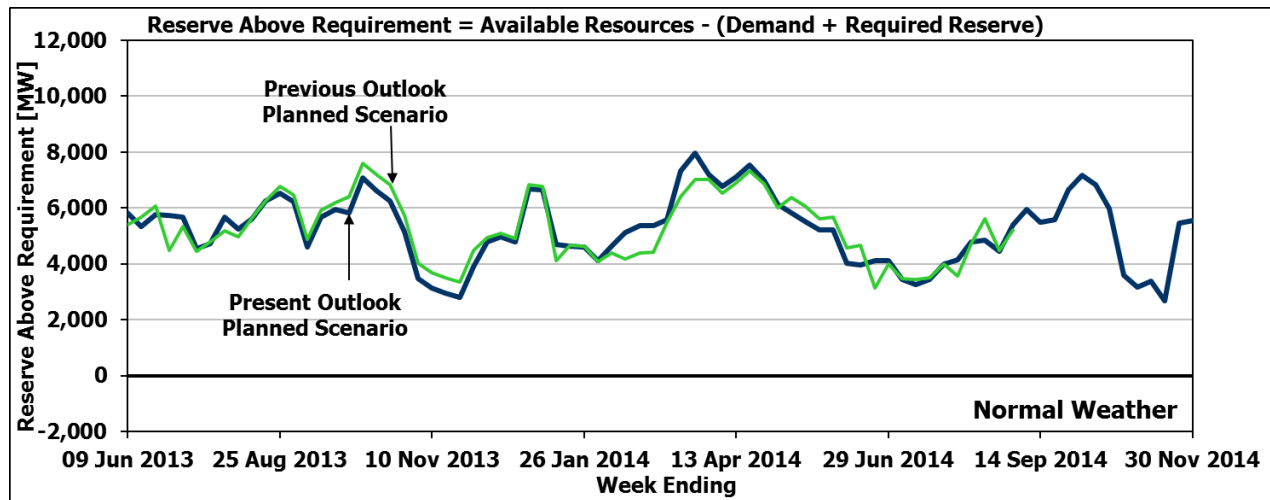
Notes	Description	Summer Peak 2013		Winter Peak 2014		Summer Peak 2014	
		Firm Scenario	Planned Scenario	Firm Scenario	Planned Scenario	Firm Scenario	Planned Scenario
1	Installed Resources (MW)	36,359	36,359	33,358	33,368	33,358	35,444
2	Total Reductions in Resources (MW)	5,785	5,785	4,110	4,036	5,369	7,157
3	Demand Measures (MW)	549	549	529	547	549	598
4	Available Resources (MW)	31,122	31,122	29,777	29,878	28,537	28,886

Notes on Table 4.5:

1. Installed Resources: This is the total generation capacity assumed to be installed at the time of the summer and winter peaks.
2. 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.
3. Demand Measures: The amount of demand available to be reduced.
4. Available Resources: Equals Installed Resources (line 1) minus Total Reductions in Resources (line 2) plus Demand Measures (line 3).

Comparison of the Current and Previous Weekly Adequacy Assessments for the Planned Normal Weather 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 28, 2013. The difference is mainly due to the changes to outages and changes in the demand forecast.

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

Resource adequacy assumptions and risks are discussed in detail in the [“Methodology to Perform Long Term Assessments”](#) (IESO_REP_0266).

- End of Section -

5 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 identify 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 and/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 this Outlook period. Major transmission and load supply projects planned to be in service are shown in [Appendix B](#). Projects that are already in service or whose completion is planned 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 not shown.

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 on existing transmission infrastructure and provide additional supply capacity for future load growth.

5.2 Transmission Outages

The IESO's assessment of the transmission outage plans is shown in [Appendix C, Tables C1 to C10](#). 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).

This Outlook contains transmission outage plans submitted to the IESO as of April 9, 2013.

5.3 Transmission System Adequacy

The IESO assesses transmission adequacy using the methodology described in IESO_REP_0266 on the basis of conformance to established [criteria](#), planned system enhancements and known transmission outages. Zonal assessments are presented in the following sections. Overall, the Ontario transmission system is expected to supply the demand under the normal weather conditions forecast for the Outlook period.

As a result of localized load increases, several areas in the province have been identified as having limited capability of existing transmission infrastructure to meet the IESO's load restoration criteria following a permanent transmission outage. The IESO, OPA and Hydro One are considering long-term options to address these situations under the Regional Planning Process established by the OEB.

5.3.1 Toronto and Surrounding Area

The Greater Toronto Area (GTA) electricity supply is expected to be adequate to meet the normal weather-forecasted demand. Hydro One is working to change the configuration of the 230 kV switchyard at Manby TS by the end of the second quarter in 2014. This transmission enhancement solution will help manage the long-term load supply in the southwestern GTA. For the short term, day-to-day operating procedures are available to manage the forecasted transmission loading during periods of high demand.

Clarington TS is scheduled to be in service as soon as spring 2015. This new station will increase the 500 to 230 kV autotransformer capacity in the eastern part of the GTA. This increased capacity will be required in advance of the shutdown of Pickering NGS, to maintain a reliable supply to the loads in the Pickering, Ajax, Whitby, Oshawa and Clarington areas.

These loads are currently supplied from four very long 230kV circuits that extend from Cherrywood TS through to eastern Ontario. Since there is only a very limited capability to supply these loads from the remote eastern terminal stations of these circuits, restoration of the supply is not expected to be possible within the times specified in the IESO's criteria. These circuits are planned to be connected into Clarington TS and once in service, it will be able to provide a full, alternative source of supply to these loads and significantly reduce restoration times.

Hydro One is continuing with the work of replacing 115 kV breakers at Hearn TS, Manby TS and Leaside TS. The new equipment is expected to be in service by the end of 2014 and will allow for more flexibility during day-to-day operation.

High voltages in southern Ontario are being experienced more frequently during periods of light load. High voltages become more acute during these periods if shunt reactors are also unavailable due to either repair or maintenance activities. The IESO is working with Hydro One and the OPA to develop options for managing this situation.

Transmission transfer capability in Toronto and its vicinity is expected to be sufficient to supply load in this area with a margin to allow for planned outages.

5.3.2 Bruce and Southwest Zones

In the Guelph area, the existing 115 kV transmission facilities are operating close to capacity and have limited margin to accommodate additional load. To improve the transmission capability into the Guelph area, Hydro One will be proceeding with the Guelph Area Transmission Refurbishment project to reinforce the supply into Guelph-Cedar TS, with an expected completion date in the second quarter of 2016. As part of this project two in-line breakers will be installed at Inverhaugh SS that will allow the 230 kV system between Detweiler TS and

Orangeville TS to be sectionalized. This will improve the restoration capability and reduce restoration times to the loads in the Waterloo, Guelph and Fergus areas.

The capability to restore loads in the Cambridge area remains very limited and does not satisfy the IESO's criteria. The OPA is working on longer-term solutions to fully address compliance with the restoration criteria for this area. A second 230/115 kV autotransformer to be installed at Preston TS, is an option that is being considered in order to improve the capability of existing transmission infrastructure in the Cambridge area to meet the IESO's load restoration criteria following a contingency. Longer-term solutions to fully address compliance with restoration criteria are being developed.

Two new 500kV switching stations, Evergreen and Ashfield, are planned to be in service by the end of 2014, to accommodate 384 MW and 270 MW of wind generation respectively.

Transmission transfer capability in the Southwest zone and its vicinity is expected to be sufficient to supply load in this area with a margin to allow for planned outages.

5.3.3 Niagara Zone

The completion date for transmission reinforcements from the Niagara region into the Hamilton-Burlington area continues to be delayed. Completion of this project will increase the transfer capability from the Niagara region to the rest of the Ontario system. Until the project is in service, the supply needs in Southern Ontario will continue to be met through the existing system.

Hydro One is working to replace existing 115 kV breakers at Allanburg TS. The new equipment is expected to be in service by the end of the third quarter of 2014 and will allow for the incorporation of additional generation in the area.

Transmission transfer capability in Niagara and its vicinity is expected to be sufficient to supply load in this area with a margin to allow for planned outages.

5.3.4 East Zone and Ottawa Zone

Hydro One is working to replace existing 115 kV breakers at Hawthorne TS. The new equipment is expected to be in service by the end of the second quarter of 2014 and will improve the reliability of the 115 kV system supplying the Ottawa area, while enabling the incorporation of generation in the Ottawa area. A new load supply transformer station, Terry Fox TS is expected to be in service by the end of 2013 to address load growth in the area.

Transmission transfer capability in the East and Ottawa zones is expected to be sufficient to supply load in this area with a margin to allow for planned outages.

5.3.5 West Zone

Transmission constraints in this zone may restrict resources in southwestern Ontario. This is evident in the constrained generation amounts shown for the Bruce and West zones in [Tables A3 and A6](#).

Hydro One is planning to uprate two 230 kV circuits from Lambton TS to Longwood TS. This is expected to be in service by the end of 2014 and will increase the transfer capability into the London area.

Transmission transfer capability in the West zone is expected to be sufficient to supply load in this area with a margin to allow for planned outages.

5.3.6 Northeast and Northwest Zones

Hydro One is expected to finish transmission work related to the Lower Mattagami generation expansion project by the end of the second quarter of 2013.

Managing grid voltages in the Northwest has always required special attention. With significantly lower demand in 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 northeast-northwest transfers.

There were occasions in the Northwest area when 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 grid voltages within acceptable ranges. These operational measures reduced the grid's ability to withstand disturbances and impacted customers' supply reliability.

To reduce and eventually eliminate the dependence on the operational measures described above, additional reactive compensation is required for voltage control in this zone. Hydro One is working on the installation of new shunt reactors at Marathon by the end of 2013 and new shunt reactors at Dryden by the end of 2014 in an effort to resolve 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 the IESO, OPA, Hydro One, local distributors, customers and First Nations are developing a regional planning study that will account for elements of the Ontario Long-Term Energy Plan and recent expansion plans of customers in the area.

The IESO is also working with Hydro One and OPG to accommodate the Atikokan conversion from coal to biomass project currently underway. Work includes completion of planned maintenance on other critical equipment to support the outage, and ensuring plans to manage high voltage situations are sufficient to cover the duration of the Atikokan outage.

Reduced load in the Northeast has resulted in voltages in the Timmins area that are higher than normally permitted. To help reduce the increasing dependence on the generating facilities in the Northeast to maintain voltages, Hydro One is allowing selected portions of the transmission system to operate at higher voltage levels.

Transmission transfer capability in the Northeast and Northwest zones is expected to be sufficient to supply load in this area with a margin to allow for planned outages.

- End of Section

6 Operability Assessment

This section highlights any existing or emerging operability issues that could potentially impact system reliability of Ontario's power system.

Over the next 18 months, Ontario continues to expand its renewable resource capacity. During the next 18 months, approximately 3,300 MW of wind, solar and biomass capacity are expected to be connected to the transmission grid. By November 2014, the total wind and solar generation connected both to the transmission and distribution networks in Ontario are expected to exceed 6,800 MW.

Solar generation – which up until now has only been embedded within distribution networks – will soon include nine new projects connected to the transmission grid, amounting to a total capacity of 180 MW. This capacity will complement the anticipated 1,700 MW of embedded solar capacity that will be in service during the outlook period.

A number of the operational changes are needed to support these levels of new supply. IESO's Renewable Integration Initiative (RII) continues to move forward towards completion and will address three key elements – forecast, visibility and dispatch of renewable resources. RII initiatives have already yielded results, including the integration of the hourly centralized forecast into the IESO scheduling tools, enhanced visibility of renewable operations within the IESO Control Room which will provide greater levels of visibility and awareness of system conditions.

The dispatch of grid-connected renewable resources is planned to be in place within the forecast period. This initiative will provide the system operator with increased flexibility from available variable generation resources, contribute to increased reliability, and will allow the IESO to operate the system more efficiently.

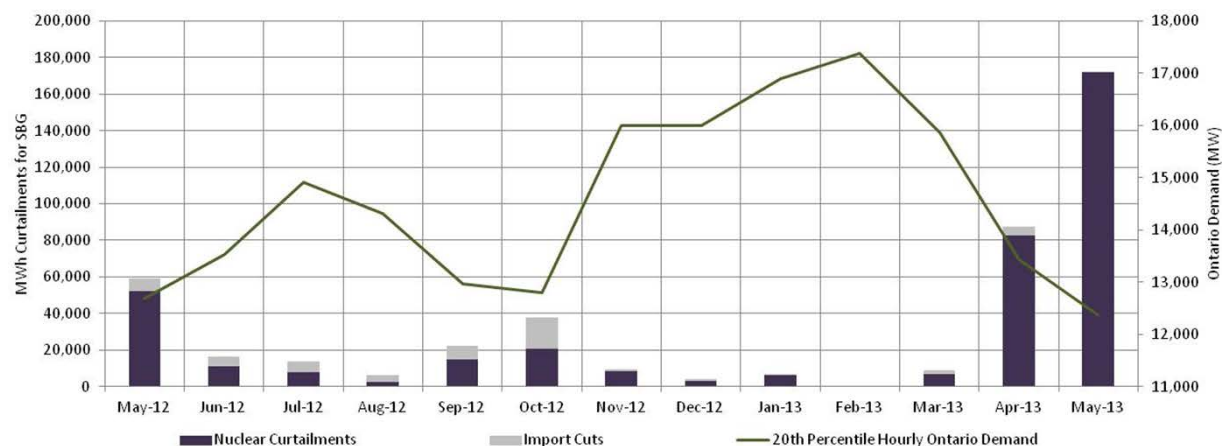
6.1 Surplus Baseload Generation (SBG)

Baseload generation is made up of nuclear, run of the river hydroelectric and variable generation such as wind. SBG conditions occur when the amount of baseload generation exceeds Ontario demand and is typically mitigated through exports. However, when the baseload fleet is expected to top Ontario demand plus scheduled exports, nuclear curtailments and managing exports are often needed to eliminate the excess. When variable generation becomes dispatchable, additional flexibility will be available to diminish the frequency of out of market control actions for SBG. These actions usually occur in the spring and fall, when the Ontario demand is lowest, and seldom occurs in extreme heat or extreme cold conditions when air conditioning or heating keeps the demand high. The correlation between Ontario demand and surplus baseload curtailments is negative, that is, when Ontario demand is low, curtailments for SBG are typically high.

Figure 6.1.1 shows the volume of nuclear and import curtailments due to surplus baseload conditions versus the bottom 20% hourly Ontario demand up till May 15, 2013. The amount of nuclear and import curtailments for SBG in Q1 of 2013 was lower than Q1 of 2012 by 6 GWh.

However, there have been three nuclear shutdowns in 2013 year to date due to SBG events as opposed to one shutdown in 2012. The total loss in nuclear energy due to SBG as of May 15, 2013 is 310 GWh compared to 106 GWh for the same timeframe in 2012.

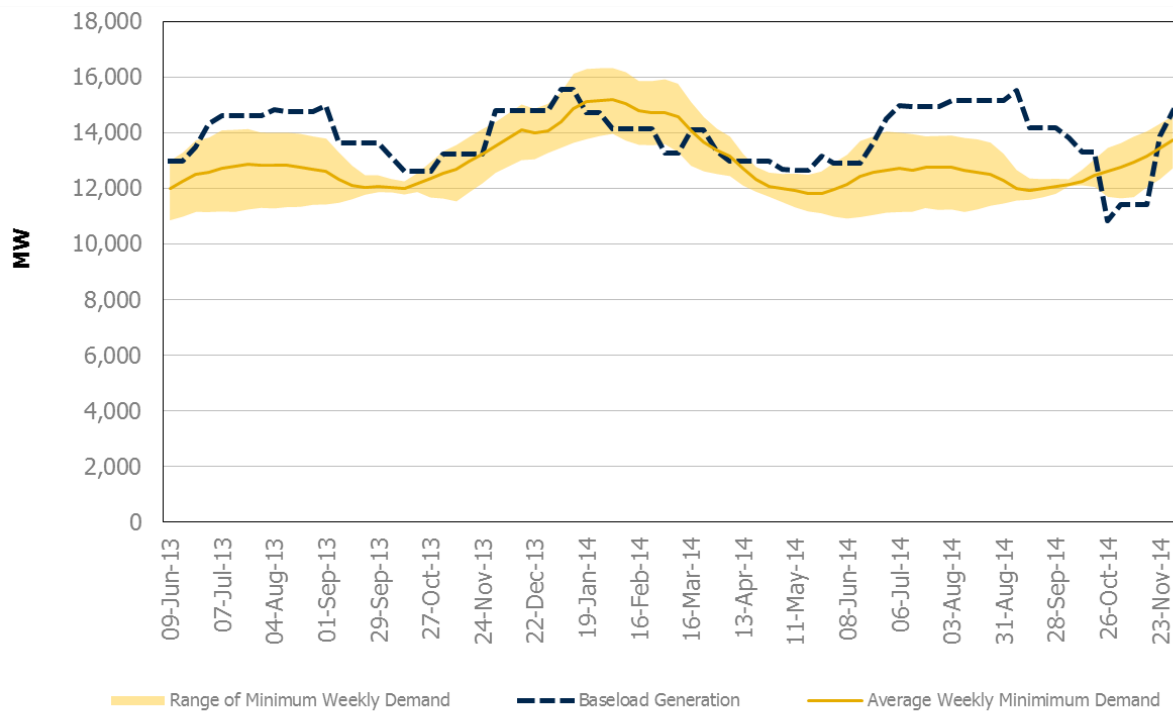
Figure 6.1.1 MWh Curtailments for SBG versus Ontario Demand



There were no significant changes in transmission or generation that would result in significant variations. The main variation between winter 2013 and winter 2012 is the increase in our baseload generation number. 2013 saw two additional nuclear facilities commissioned into service.

The expected SBG for the next 18 months can be seen in Figure 6.1.2. The baseload generation assumptions include market participant-submitted minimum production data, the latest planned outage information, projected forced outage rates, in-service dates for new or refurbished generation, and reliable export capability. 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.

Figure 6.1.2 Minimum Ontario Demand and Baseload Generation (includes Net Export assumption)



Ontario will continue to experience an increase in volume, frequency and duration of SBG conditions with declining wholesale demand for electricity and significant quantities of baseload generation on the system. A vast majority of SBG is being managed via IESO tools and processes such as nuclear maneuvering and managing exports. The IESO will gain another tool to help manage SBG in September 2013 as wind becomes a dispatchable resource, and helps to maintain operational efficiency.

- End of Section

7 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

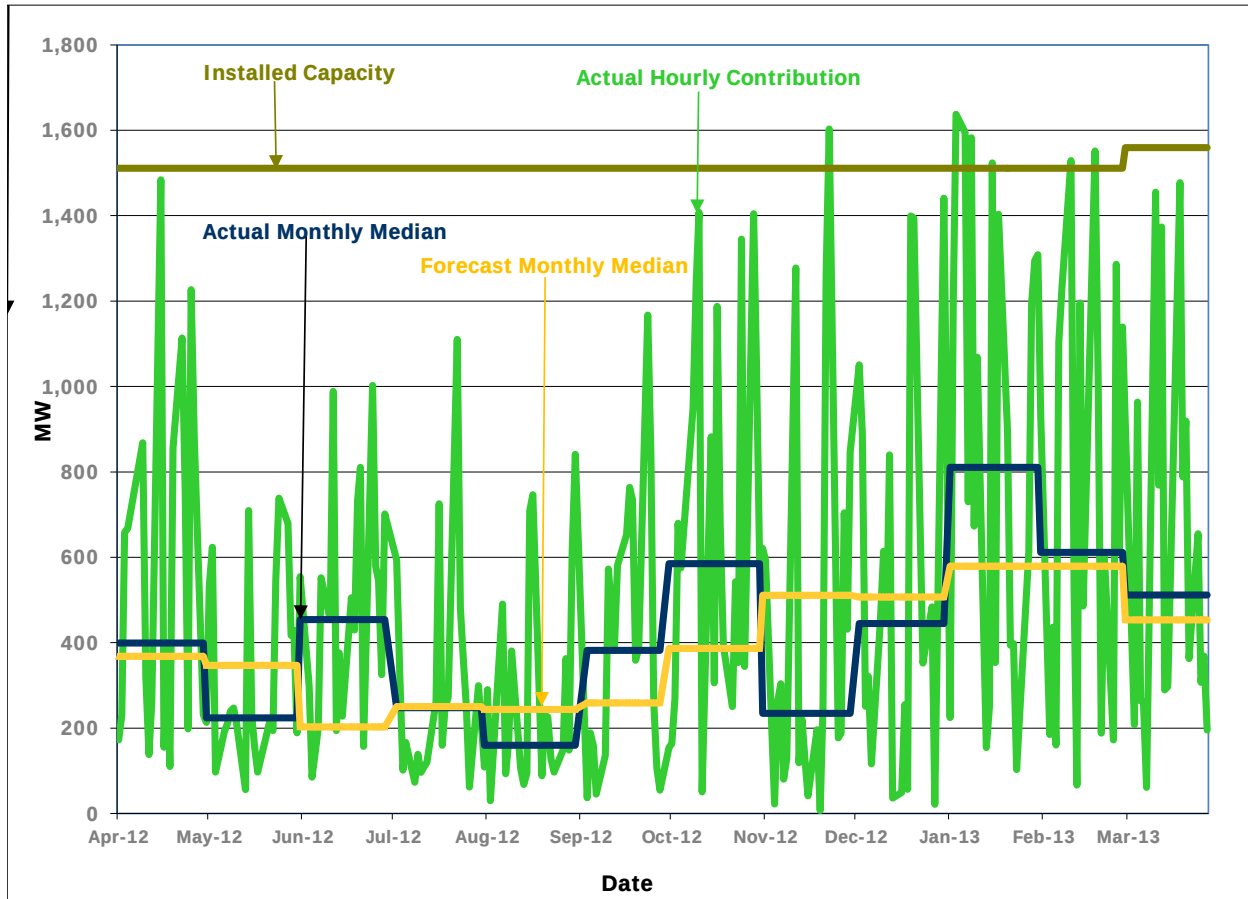
Since the last Ontario Demand Forecast document was published, actual demand and weather data have been reported for the six months of November through April.

Overall, energy demand for the six months was up a robust 2.3% compared to the same months a year earlier. After adjusting for the leap year affects, demand would have been up by 3.2% over the same six month period a year earlier. However, the weather had much to do with the growth. After adjusting for weather the growth rate was a much lower 0.3% decline and 0.6% growth after the leap year adjustment. Still, demand has shown some strength heading into 2013. The growth has not been consistent fluctuating month to month.

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 2012 to March 2013. Holiday and weekend data were not considered in the analysis since hydro peaking generation and interchange transactions 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 values. The forecast methodology takes into account seasonal variances in wind patterns, among other factors. Installed wind capacity is expected to continue to grow with wind generation procured under the 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 is typically the median contribution of hydroelectric energy at the time of weekday peak since 2002. However, if low water persists, the forecast is adjusted accordingly to reflect the observed trend. The hydroelectric production at the hour of weekday peak summer months were lower than forecasted. The lower summer values are due to a decrease in precipitation levels from previous years and project related outages scheduled for hydroelectric generating stations. As in previous reports, we expect the impact of these outages to continue at varying degrees over the next 18 months. We have made adjustments to the forecast in this Outlook to account for these outages.

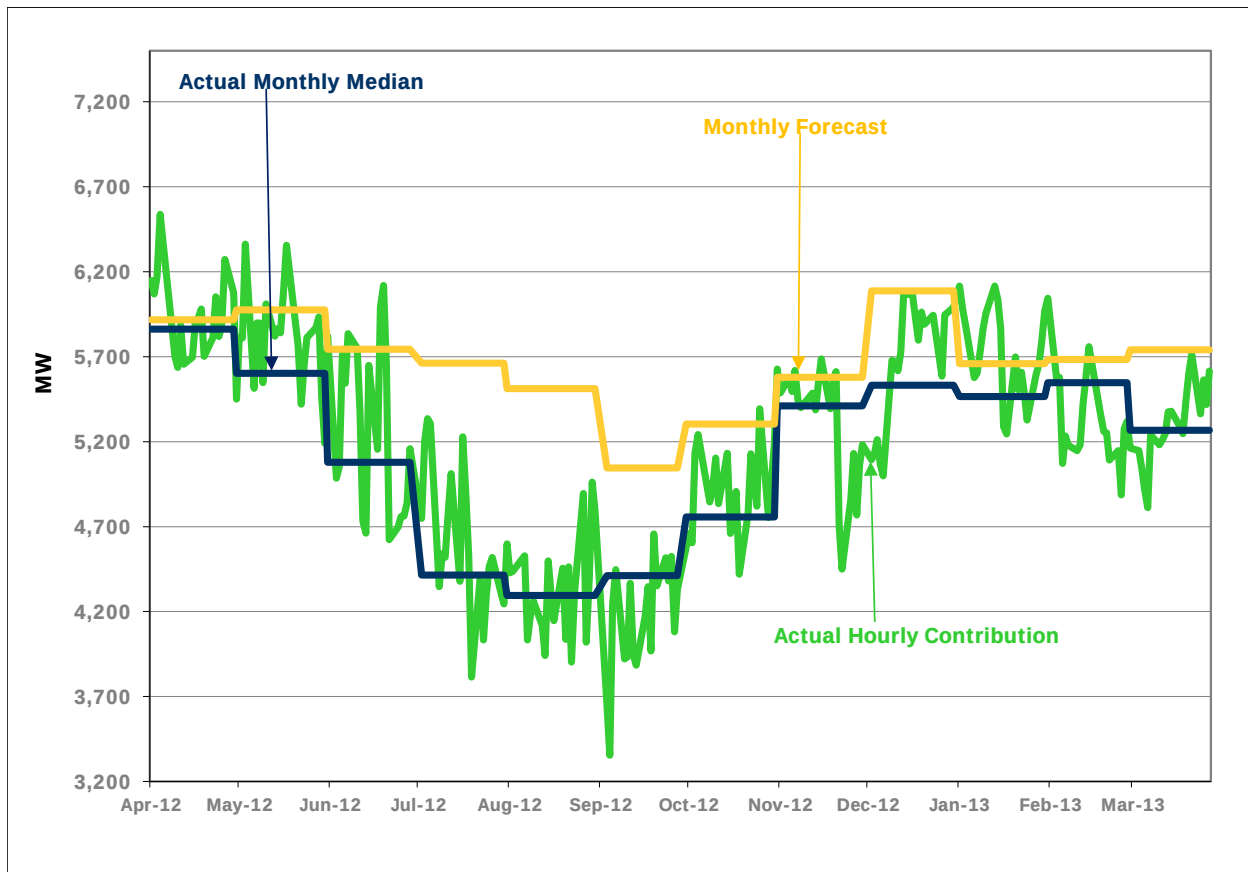
Figure 7.2.2 Hydro Contributions (Energy and Operating Reserve) at the Time of Weekday Peak

Figure 7.2.3 shows imports into Ontario at the time of weekday peak. Summer 2012 imports were noticeably higher than the rest of the reporting period. The extremely high temperatures in July and August contributed to high demands, high prices and consequently an increase in imports. In contrast, the mild fall of 2012 contributed to low demand and an increase in our baseload nuclear fleet in the early winter of 2013 contributed to low prices and therefore lower imports.

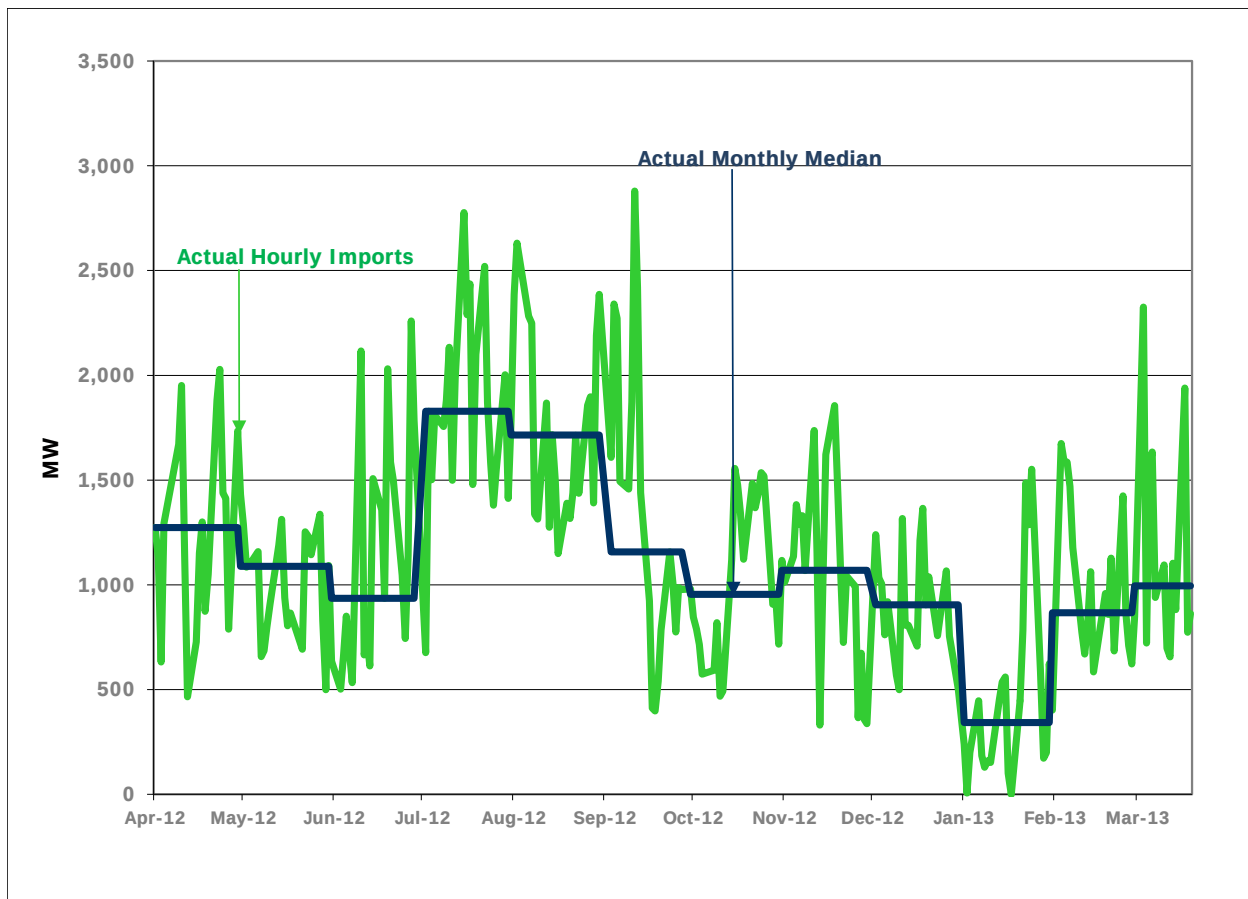
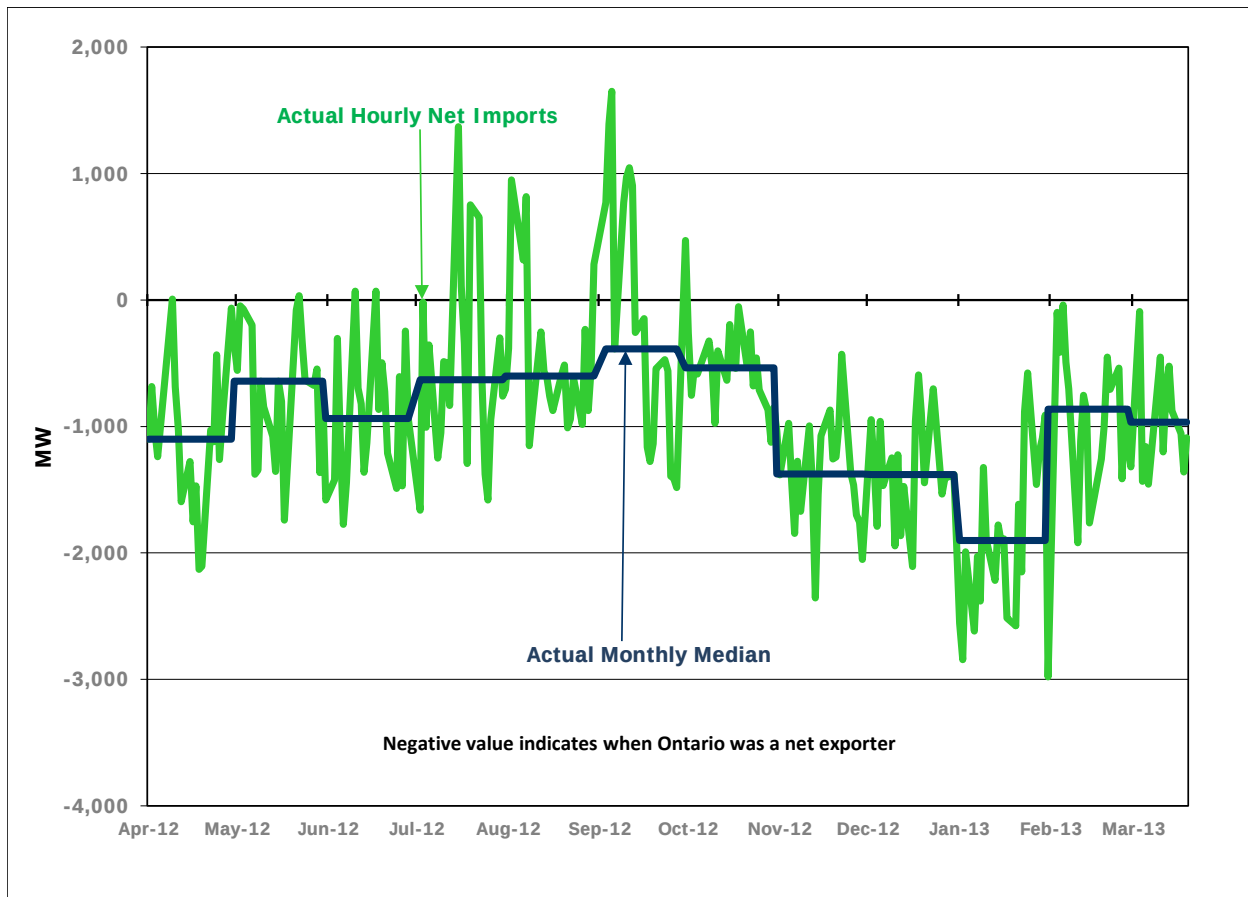
Figure 7.2.3 Imports into Ontario at the Time of Weekday Peak

Figure 7.2.4 shows the amount of net interchange 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 situation prevailed, which can be in part attributed to the continued export capability with Quebec. Additionally, surplus baseload generation conditions caused by ample generation and lower demands further contributed to Ontario being a net exporter for most of the reporting period.

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

7.3 Report on Initiatives

Centralized forecasting for variable resources is an initiative which provides better forecasting of energy production in order to ensure that more accurate unit commitment and intertie scheduling occurs. A centralized forecast was implemented and integrated into IESO day-ahead and hourly scheduling processes in November 2012. Forecasting for embedded variable resources will be developed by Q3 2013. Additionally, RII will facilitate the dispatching of variable generation, with implementation set for September 2013.

Variable generation dispatch will allow for greater flexibility and help alleviate surplus baseload generation concerns.

- End of Document -