18-MONTH OUTLOOK

From December 2011 to May 2013

ieso
Power to Ontario. On Demand.

Ontario Demand Forecast

Executive Summary

The IESO is responsible for forecasting electricity demand on the IESO-controlled grid and for assessing whether transmission and generation facilities are adequate to meet Ontario's needs. This document presents the electricity demand forecast for the period from December 2011 to May 2013 and supersedes the previous forecast released in August 2011.

Economic Outlook

Despite strong Canadian economic fundamentals - low inflation, low interest rates, moderate debt levels and a sound financial sector - Ontario's economy has been negatively impacted by forces external to the country. The interdependence of the global economy means that events beyond our control have an impact on us whether it is supply disruptions in the automotive sector from the Tohoku earthquake and tsunami or the European sovereign debt issue's impact on capital markets. Not all international developments have the same impact on Ontario. The most significant external factor would be the state of the U.S. economy. With the U.S. mired in a period of sluggish growth, low job creation and high consumer debt levels, the growth outlook is not entirely promising. And this in turn affects Ontario. Strong domestic fundamentals are helping certain sectors such as housing, but even Canadian consumers are cautious as they also carry significant debt.

Unfortunately, the key issues of high debt levels and high employment are not items that can be dealt with quickly and will linger on throughout the forecast thereby limiting growth. While our strong fundamentals will help fuel domestic demand, it is the export demand of goods and commodities demand that drives industrial electricity consumption.

The keys to the economic outlook are:

- Spending restraint – Both governments and consumers have high debt loads and will look to keep their spending prudent. Business spending has been strong driven by low borrowing costs. However, consumers are the largest sector of the economy and their behaviour will have a much bigger impact on future growth.
- Consumer confidence – As mentioned in the previous point the consumer is at the heart of any future growth. Consumer confidence has taken a beating throughout 2011 for a variety of reasons. Confidence now stands at the lowest level since May 2009 when the economy was in the midst of recession. Confidence has declined throughout 2011 and is significantly lower than prior to the recession.
- U.S. Economy – Growth prospects remain weak for the U.S. economy. Consumer confidence is at the same level as during the recession as Americans worry about income and jobs. Though the economy has shown recent strength, unemployment will remain high as GDP growth in excess of 2.5% is required to stimulate significant job creation. Meanwhile with low interest rates and a tripling of the money supply

through two rounds of quantitative easing there aren't any significant stimulus moves left for the government.

Economic growth will be modest over the forecast horizon.

Actual Weather and Demand

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

For the first four months of the period demand showed year over year declines compared to the same period a year ago. It has only been the last two months – August and September – where demand has shown any growth. For the whole six months energy demand was down 1.6% (down 1.1% weather corrected).

The overall weather was fairly typical with the exception being July. July was both hotter than normal and very dry. Several communities broke decade old records for temperature and precipitation. In particular, a hot spell from July 16th to the 23rd had daily highs in excess of 30°C. On Thursday, July 21st temperatures reached upwards of 35°C and the Humidex reached 49°C. Peak demand was the highest since 2007 as it topped 25,450 MW. If it wasn't for over 450MW of demand response, the peak would have been the highest since the all-time record set in August 2006.

Minimum demands have shown some year over year increase. Minimums were up year over year for the months of July through October.

Wholesale consumers' load has been virtually flat compared to the 2010. The year started strong but as 2011 unfolded the numbers started to deteriorate much in the same way that the GDP dropped in the second quarter.

Demand Forecast

The 18-Month Outlook's demand forecast includes the impact of additional conservation savings and demand reductions from projected off-grid or embedded generation. The Ontario Power Authority (OPA) and local distribution companies (LDCs) will be the organizations driving these impacts through their program offerings. In the 18-Month Outlook the impacts of conservation and embedded generation are decremented from demand, whereas demand response programs are included in our analysis as a resource under the category of demand measures. Conservation, embedded generation and demand response are discussed in section 4.4 of this document.

Table 1 summarizes the annual peak and energy demand forecast for the period covered in this 18-month forecast. Peak demands will show only small increases over the forecast horizon as conservation, embedded generation and time-of-use prices offset the demand growth attributable to the economic recovery, demographic growth and increases in the number of electric end-use devices.

Energy demand is expected to show a slight decline this year with very modest growth expected in 2012. Since 2012 is a leap year, growth gets a boost from having an additional day.

Table 1: Peak and Energy Demand Forecast

Season	Normal Weather Peak (MW)	Extreme Weather Peak (MW)
Winter 2011-12	22,160	23,424
Summer 2012	23,527	25,972
Winter 2012-13	22,375	23,555
Year	**Normal Weather Energy (TWh)**	**% Growth in Energy**
2006 Energy	152.3	-1.9%
2007 Energy	151.6	-0.5%
2008 Energy	148.9	-1.8%
2009 Energy	140.4	-5.7%
2010 Energy	142.1	1.2%
2011 Energy (Forecast)	141.6	-0.3%
2012 Energy (Forecast)	143.2	1.1%

- End of Section

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1.0 Introduction

1.1 Outlook Documents

The Ontario Electricity Market Rules (Chapter 5 Section 7.1) require that a demand forecast for the next 18 months be produced and published on a quarterly basis. This Ontario Demand Forecast meets this requirement and covers the period from December 2011 to May 2013. It supersedes the previous forecast released August 2011.

1.2 Demand Forecast Document

This document provides an 18-month forecast of electricity demand for Ontario, based on the stated assumptions and using the methodology described in the document "Methodology to Perform Long Term Assessments" (IESO_REP_0266), found on the IESO website at http://www.ieso.ca/imoweb/pubs/marketReports/Methodology_RTAA_2011nov.pdf. Readers may envision other scenarios, recognizing the uncertainties associated with various input assumptions, and are encouraged to use their own judgement in considering possible future scenarios. This forecast provides a base upon which changes in assumptions can be considered.

Ontario demand is the sum of coincident loads plus the losses on the IESO-controlled grid. This demand forecast was based on actual demand, weather and economic data through the end of August 2011. Data for September and October have been incorporated into the tables and figures of this document. This document is divided into the following sections:

- Section 2.0 summarizes the forecast results
- Section 3.0 looks at historical demand
- Section 4.0 describes the assumptions used in this forecast of electricity demand
- All the tables in this report are contained in the 18-Month Outlook Tables (http://www.ieso.ca/imoweb/pubs/marketReports/18MonthOutlookTables_2011nov.xls) spreadsheet posted alongside the Outlook documents. The spreadsheet's historical tables contain data right back to market opening which would not be practical in a printed document.

Readers are invited to provide comments or suggestions regarding the content of this or future reports. To do so, please call the IESO Customer Relations at 905-403-6900 or 1-888-448-7777 or send an email to customer.relations@ieso.ca.

Electronic copies of the forecast and weather scenarios are available upon request.

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2.0 Demand Forecast

This section presents the demand forecast for the Outlook period. Additional tables are included in the 18-Month Outlook Tables spreadsheet.

Table 2.1 contains the forecast of system weekly peak and energy demand. It also includes the load forecast uncertainty (LFU) for the weekly peak. The LFU is a measure of variability in load due to the volatility of weather.

Table 2.1: Weekly Peak and Energy Demand Forecast

Week Ending	Normal Peak (MW)	Extreme Peak (MW)	Load Forecast Uncertainty (MW)	Normal Energy Demand (GWh)	Week Ending	Normal Peak (MW)	Extreme Peak (MW)	Load Forecast Uncertainty (MW)	Normal Energy Demand (GWh)
04-Dec-11	20,755	21,849	536	2,839	02-Sep-12	21,856	24,875	1,260	2,802
11-Dec-11	21,668	22,609	528	2,923	09-Sep-12	21,059	23,640	1,618	2,680
18-Dec-11	21,669	22,701	622	2,949	16-Sep-12	19,509	23,084	1,515	2,605
25-Dec-11	21,942	22,959	519	2,966	23-Sep-12	19,561	21,716	828	2,551
01-Jan-12	21,052	22,310	515	2,767	30-Sep-12	19,227	20,484	537	2,568
08-Jan-12	21,726	22,869	614	2,933	07-Oct-12	18,154	18,819	753	2,538
15-Jan-12	22,160	23,142	654	3,049	14-Oct-12	17,821	18,810	722	2,506
22-Jan-12	22,145	23,424	656	3,051	21-Oct-12	17,972	18,521	630	2,562
29-Jan-12	22,043	23,011	694	3,043	28-Oct-12	18,614	19,054	703	2,589
05-Feb-12	21,814	22,682	597	3,005	04-Nov-12	18,594	19,830	774	2,595
12-Feb-12	21,368	22,627	520	3,011	11-Nov-12	19,694	20,085	572	2,685
19-Feb-12	21,500	22,571	498	2,979	18-Nov-12	20,004	20,748	434	2,749
26-Feb-12	20,768	22,284	417	2,863	25-Nov-12	20,463	21,083	487	2,807
04-Mar-12	20,642	21,916	595	2,907	02-Dec-12	20,884	21,627	503	2,851
11-Mar-12	20,813	21,660	440	2,900	09-Dec-12	21,649	22,597	497	2,935
18-Mar-12	19,744	20,588	756	2,811	16-Dec-12	21,668	22,716	681	2,956
25-Mar-12	19,388	20,230	718	2,772	23-Dec-12	21,978	22,954	473	2,999
01-Apr-12	19,079	20,011	820	2,675	30-Dec-12	20,068	21,748	435	2,725
08-Apr-12	18,839	19,902	652	2,647	06-Jan-13	21,556	23,200	700	2,912
15-Apr-12	18,242	19,161	380	2,596	13-Jan-13	22,375	23,418	740	3,067
22-Apr-12	17,844	18,853	401	2,532	20-Jan-13	22,254	23,555	638	3,080
29-Apr-12	17,459	18,797	424	2,532	27-Jan-13	22,122	23,098	634	3,041
06-May-12	17,466	20,362	600	2,501	03-Feb-13	22,022	23,092	649	3,034
13-May-12	17,952	20,922	633	2,504	10-Feb-13	22,161	22,913	588	3,059
20-May-12	17,945	20,561	671	2,482	17-Feb-13	21,572	22,787	653	3,014
27-May-12	19,110	22,748	1,086	2,461	24-Feb-13	21,179	22,569	549	2,906
03-Jun-12	19,134	23,521	1,585	2,559	03-Mar-13	20,997	22,480	492	2,947
10-Jun-12	19,876	23,582	1,401	2,631	10-Mar-13	21,089	21,961	464	2,923
17-Jun-12	20,704	24,640	1,600	2,713	17-Mar-13	20,078	20,929	495	2,859
24-Jun-12	22,317	25,143	879	2,723	24-Mar-13	19,768	20,717	658	2,815
01-Jul-12	22,884	25,088	994	2,834	31-Mar-13	19,127	20,210	512	2,660
08-Jul-12	22,823	24,749	880	2,793	07-Apr-13	19,043	20,209	512	2,698
15-Jul-12	23,527	25,972	942	2,874	14-Apr-13	18,483	19,407	480	2,641
22-Jul-12	23,524	25,192	1,051	2,897	21-Apr-13	18,086	19,072	484	2,576
29-Jul-12	23,123	25,356	780	2,777	28-Apr-13	17,699	18,933	538	2,560
05-Aug-12	23,236	25,394	1,178	2,887	05-May-13	17,587	20,508	588	2,506
12-Aug-12	22,646	25,433	1,261	2,830	12-May-13	17,960	21,135	834	2,521
19-Aug-12	22,500	24,657	997	2,834	19-May-13	18,143	20,772	787	2,490
26-Aug-12	22,084	24,760	1,012	2,791	26-May-13	19,516	22,968	887	2,478

Compared to the previous forecast, weekly peak and energy demand are lower for most weeks. Figures 2.1 and 2.2 show the projected energy and peak demand for the outlook period.

Figure 2.1: Weekly Energy Demand – History and Forecast

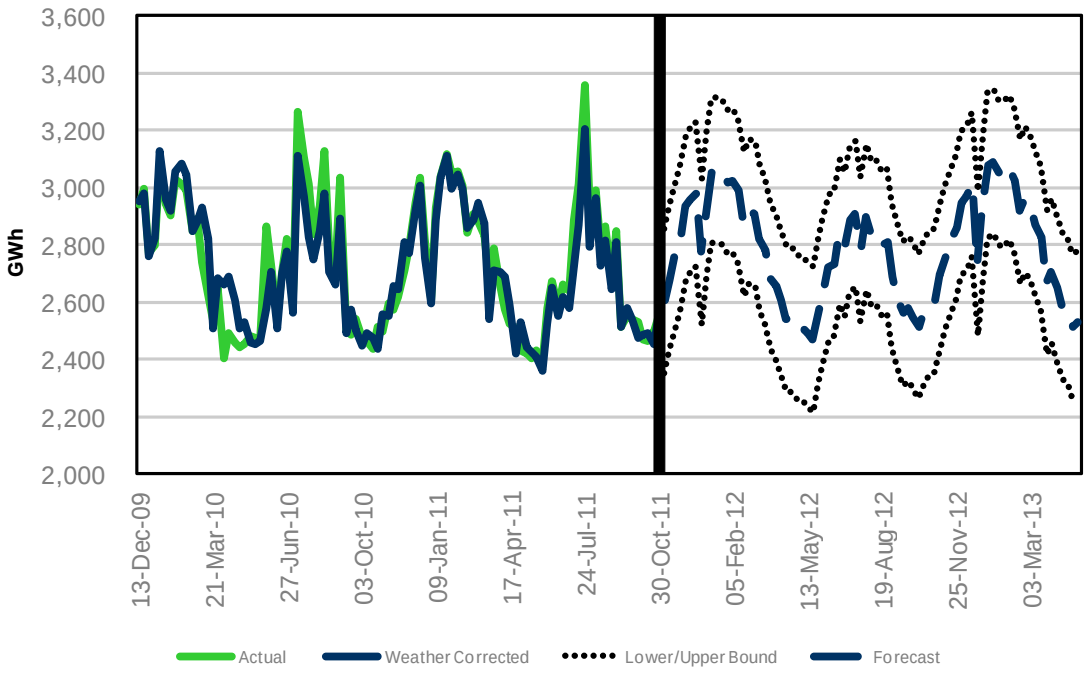
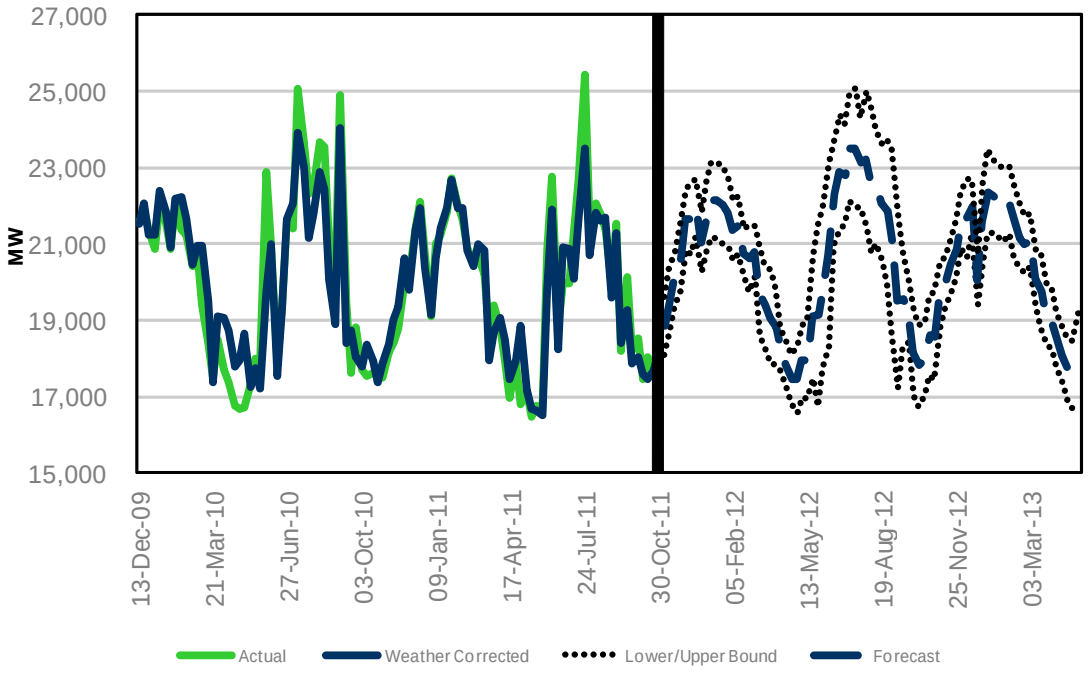


Figure 2.2: Weekly Peak Demand – History and Forecast



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3.0 Historical Review

This section discusses historical electricity demand. The weather-corrected numbers are generated based on Normal weather.

3.1 Six Month Review - May to October

The most significant portion of this period was the summer months of June, July and August. Generally, it was warmer than normal over the period but for most of the months demand was lower than the previous year. Table 3.1 contains a summary of the weather and demand for the past six months.

May

- May was warmer than normal both in terms of average and peak temperature though lower than the previous May.
- Both the peak (20,847 MW) and energy demand (10.8 TWh) were lower than the previous May, reflecting the weather's impact. Weather corrected energy demand declined by 3.2% compared to the previous May.
- Minimum demand (10,799 MW) was lower than the previous May's. It occurred in the early hours of the Victoria Day holiday.
- Wholesale industrial energy demand was 1.6% lower than May 2010. This was the first year over year decline in 2011.

June

- June's average temperature was slightly cooler than normal, but the peak temperature was higher than normal. June 2011 had a higher average and peak temperature than the previous June.
- The actual peak and energy demand were higher than the previous June, reflecting the weather's impact. Weather corrected energy demand was 2.8% lower compared to a year earlier.
- Minimum demand (10,890 MW) was lower than the previous June's (11,506 MW).
- Wholesale industrial energy demand was 8.6% lower than June 2010 and only 1.6% above the recessionary June 2009.

July

- July was hot and dry and broke decades old records for a number of Ontario's communities. Both the average and peak temperatures were significantly higher than the previous July.
- The July peak was the highest summer peak since 2007. As well, at the time of the peak there was nearly 450 MW of demand response activated. Despite the high temperatures energy demand was actually lower than the previous July. Weather corrected energy demand was 0.7% lower compared to a year earlier.
- Minimum demand (11,529 MW) was higher than July 2010 (11,400 MW).

- Wholesale industrial energy demand was 3.0% lower than July 2010, but 9.0% above the recessionary July 2009.

August

- August was slightly warmer than normal but cooler than the previous August.
- The actual peak and energy demand were lower than the previous year's. Weather corrected energy demand was 1.4% lower compared to a year earlier.
- Minimum demand (12,205 MW) was the highest since August 2008.
- Wholesale industrial energy demand was down slightly (-0.2%) compared to the previous year and 5.8% higher than August 2009.

September

- September was near normal - both in terms of average and peak temperature. The peak temperature was much lower than the previous September.
- Though the peak (21,552 MW) was lower than the previous September, energy demand was higher. Weather corrected energy demand increased by 1.8% over the previous year and was the first increase since March.
- Minimum demand (11,300 MW) was also higher than the previous year's.
- Wholesale industrial energy demand was 0.9% higher than September 2010.

October

- October was slightly warmer than normal and similar to last year's weather. Unlike last October, the peak was cold weather driven. Weather is less of a factor in October than the other months reported here.
- The actual peak and energy demand were higher than the previous October. Weather corrected energy demand was 0.4% higher than a year earlier but 1.6% lower than October 2009.
- Much like energy demand, minimum demand (11,124 MW) was higher than the previous year but lower than 2009 (11,295 MW).
- Wholesale industrial energy demand was 3.1% lower than October 2010, a reversal of the previous two months but consistent with the manufacturing job losses in the month.

Table 3.3.2 of the 18-Month Outlook Tables spreadsheet contains monthly demand information going back to market opening. Table 3.1 contains a summary of the weather and demand for the past six months.

Table 3.1: Historical 2010 Weather and Demand Summary

Historical Analysis		May	June	July	August	September	October
Actual	Average Temperature (°C)	17.7	23.5	29.4	26.5	21.6	14.4
	Minimum Temperature (°C)	7.0	17.3	23.5	21.9	15.4	4.7
	Maximum Temperature (°C)	29.3	33.3	37.5	31.3	30.0	27.1
Monthly Normal	Normal Average Temperature (°C)	16.4	23.6	26.4	24.4	21.0	13.1
	Normal Minimum Temperature (°C)	8.6	13.4	20.0	18.2	12.8	4.0
	Normal Maximum Temperature (°C)	27.2	31.3	30.9	30.8	29.8	23.3
Actual	Peak Demand (MW)	20,870	22,765	25,450	22,051	21,552	18,234
	Average Hour (MW)	14,491	15,608	17,874	16,844	15,479	14,800
	Minimum Hour (MW)	10,799	10,890	11,529	12,205	11,300	11,124
	90th Percentile (MW)	16,552	18,749	21,828	20,167	18,072	16,971
	Percent above 20,000 (MW)	1.2%	2.5%	25.6%	11.3%	3.3%	0.0%
	# of Hours Above 20,000 (MW)	9	18	190	84	24	0
	Energy Demand (GWh)	10,782	11,238	13,298	12,532	11,145	11,011
Weather Corrected	Peak Demand (MW)	18,708	21,900	23,501	21,833	21,284	18,603
	Energy Demand (GWh)	10,718	11,157	12,621	12,314	11,120	11,010
Forecast	Peak Demand (MW)	18,515	23,107	23,539	23,197	21,239	18,437
	Energy Demand (GWh)	10,935	11,593	12,518	12,538	10,965	11,155

Notes for Table 3.1 – Weather is for Toronto. Temperature is the daily high. Forecast is the most recent for that period.

3.2 Historical Energy Demand

The fourth quarter of 2010 had energy demand decreasing over the previous year. For 2011, that pattern of decline has held for seven of the ten months so far. Only recently, in September and October, did energy demand show growth. Actual demand is projected to show growth of 0.4% over 2010 but a slight decline of 0.3% on a weather corrected basis.

The wholesale customers' consumption has mirrored the economic conditions. Consumption was strong to start the year but began to deteriorate at the end of the second quarter and fell further in the third quarter. For the first ten months of 2011 industrial demand is down 0.1% compared to the same time frame in 2010, up 4.5% above the recessionary levels of 2009, but 22.2% below the same period in 2008.

Figure 3.1 shows the year-over-year change in wholesale customers' average hourly consumption. Consumption had been on a downward trend since the spring of 2005, a result of the appreciating Canadian dollar. Demand had started to increase just prior to the financial crisis of late 2008.

Figure 3.2 shows the wholesale customers' average hourly load by industry segment for for the first ten months of 2008-2011. The graph shows that those industries with the highest load levels have seen the greatest reduction in their load. Additionally, none of the segments have surpassed their pre-recessionary levels.

Figure 3.1: Wholesale Customers' Year-over-Year Change in Consumption

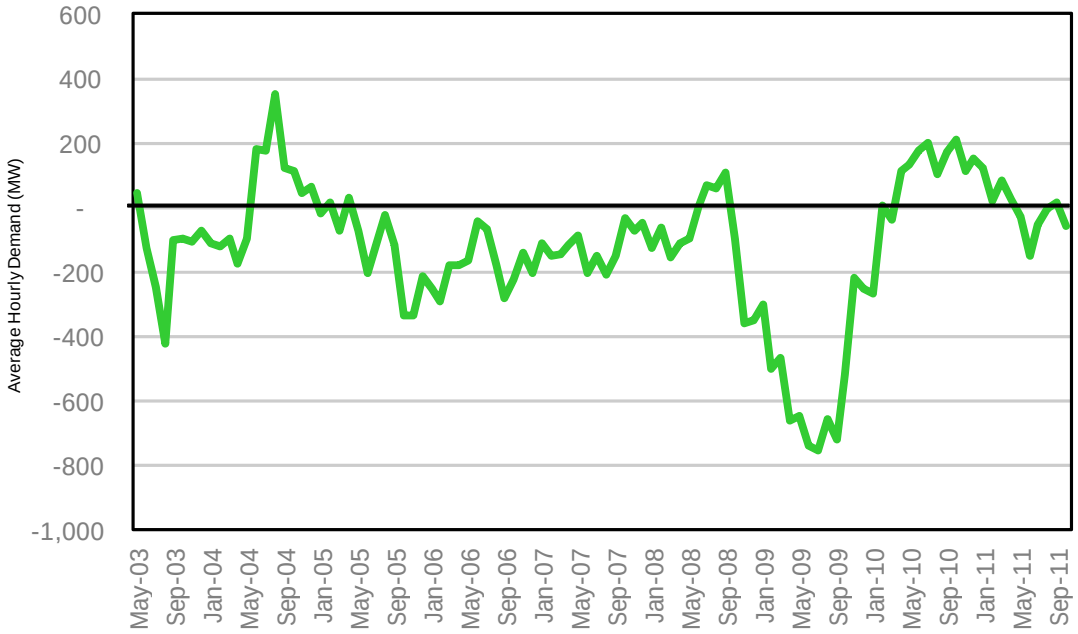
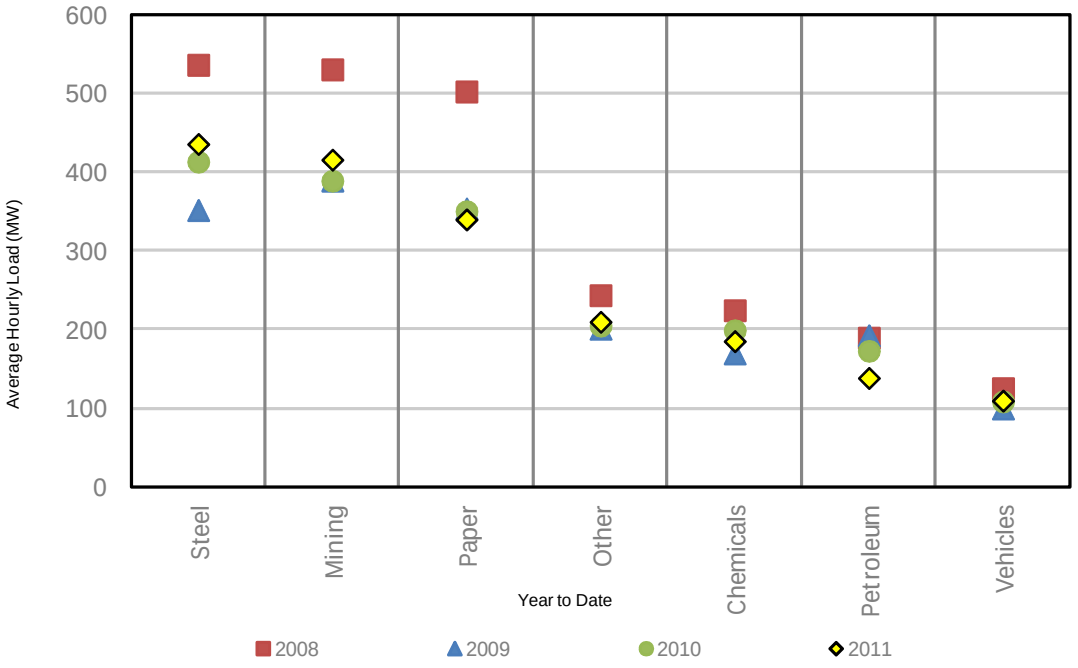


Figure 3.2: Wholesale Customers' Average Hourly Consumption by Industry Segment



Overall energy demand has followed a similar path to that of the industrial sector. Though not as volatile, energy demand growth has been flat or negative since 2005. Part of this is due to

economic factors but the growth in conservation and embedded generation has further eroded the demand for electricity on the IESO-controlled grid.

Figure 3.3 shows quarterly energy demand and embedded generation. Though embedded generation is fairly volatile, the underlying upward trend is quite evident in the graph. Moving forward the embedded generation component will continue to grow as more FIT and Micro-FIT contracts come into commercial operation.

Figure 3.3: Quarterly Energy Demand and Embedded Generation

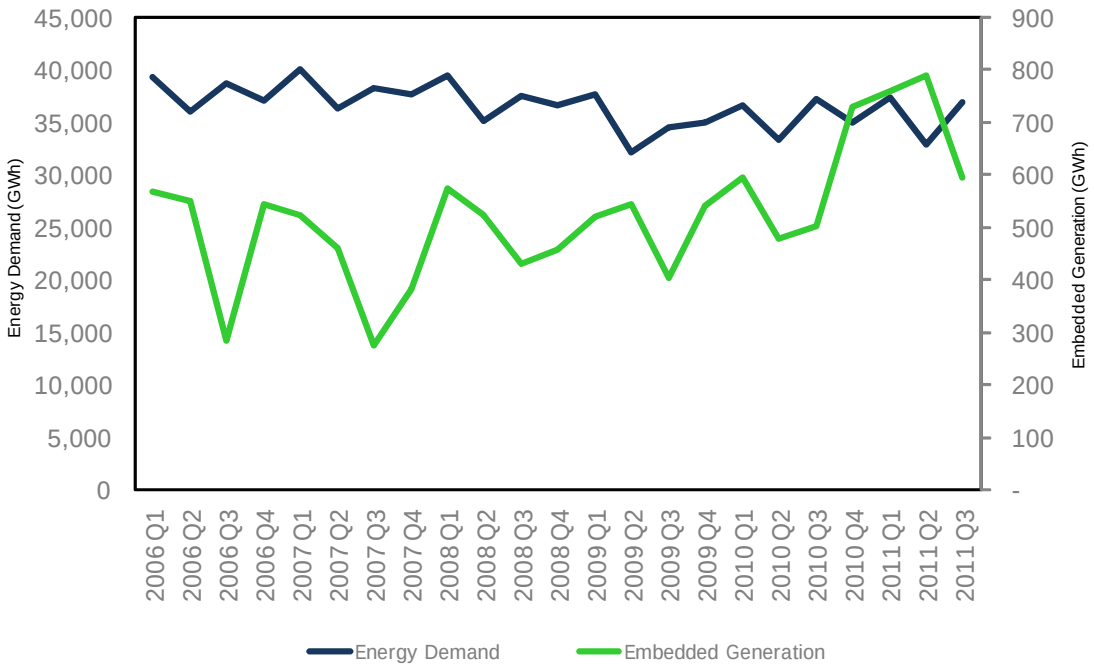


Table 3.2 contains the weekly energy demand for the past six months. The table has the actual and weather-corrected demand for each week and notes any item of significance for the week. If the weather-corrected demand is greater than the actual demand, it means that the actual weather was milder than normal. Additional history is available in the 18-Month Outlook Tables spreadsheet in Table 3.3.1.

Table 3.2: Historical Weekly Energy Demand

Week Number	Week Ending	Peak Day	Actual Energy (GWh)	Corrected Energy (GWh)	Notes
18	08-May-11	03-May-11	2,422	2,444	
19	15-May-11	13-May-11	2,407	2,426	
20	22-May-11	16-May-11	2,435	2,413	
21	29-May-11	26-May-11	2,389	2,362	Victoria Day
22	05-Jun-11	31-May-11	2,578	2,527	
23	12-Jun-11	08-Jun-11	2,673	2,649	
24	19-Jun-11	16-Jun-11	2,578	2,553	
25	26-Jun-11	21-Jun-11	2,663	2,622	
26	03-Jul-11	28-Jun-11	2,642	2,579	Canada Day
27	10-Jul-11	06-Jul-11	2,886	2,725	
28	17-Jul-11	12-Jul-11	3,016	2,871	
29	24-Jul-11	21-Jul-11	3,358	3,206	Summer Peak
30	31-Jul-11	29-Jul-11	2,952	2,797	
31	07-Aug-11	02-Aug-11	2,992	2,965	Civic Holiday
32	14-Aug-11	08-Aug-11	2,794	2,731	
33	21-Aug-11	18-Aug-11	2,868	2,818	
34	28-Aug-11	24-Aug-11	2,688	2,647	
35	04-Sep-11	02-Sep-11	2,848	2,808	
36	11-Sep-11	09-Sep-11	2,516	2,516	Labour Day
37	18-Sep-11	12-Sep-11	2,553	2,579	
38	25-Sep-11	21-Sep-11	2,541	2,541	
39	02-Oct-11	26-Sep-11	2,532	2,477	
40	09-Oct-11	03-Oct-11	2,470	2,489	
41	16-Oct-11	12-Oct-11	2,464	2,491	Thanksgiving Day
42	23-Oct-11	19-Oct-11	2,497	2,453	
43	30-Oct-11	27-Oct-11	2,555	2,554	

3.3 Historical Peak Demand

Peak demands are weather-driven, weekday events. Peak demands have been facing downward pressure due to a number of factors. Conservation, time of use rates, embedded generation, demand response and lower levels of economic activity have all contributed to lower peak demands.

July 2011 was notably hot and humid, breaking decades old records across many communities. From July 16th to July 23rd daily highs were consistently above of 30°C. This heat wave led to the summer peak demand of 25,450 MW, which was the highest peak since the summer of 2007. However, the actual peak demand would have been much higher had it not been for a number of demand measures that reduced demand by roughly 450 MW. These reductions were the result of actions by the OPA's demand response programs, Peaksaver and the IESO's dispatchable loads program.

Figure 3.4 shows the wholesale customers' consumption at the time of the monthly peak and the average hourly consumption for the month. The graph clearly shows the economic impact on peak demands. It also illustrates that average and peak demands are highly correlated. The interesting aspect of this graph is the big gap between the average hour and peak hour consumption for July. In essence, this deviation is another form of demand response. In January 2011 Regulation 398/10 was implemented. The Regulation allows Class A customers to reduce

their Global Adjustment charges by reducing their consumption during the five peak hours of a specified base period. (For more information follow this link Global Adjustment). This provided significant financial incentive for these customers to reduce their consumption during this heat wave as it was clearly leading to peak demand conditions.

Figure 3.4: Wholesale Customers' Coincident Peak and Average Hourly Consumption

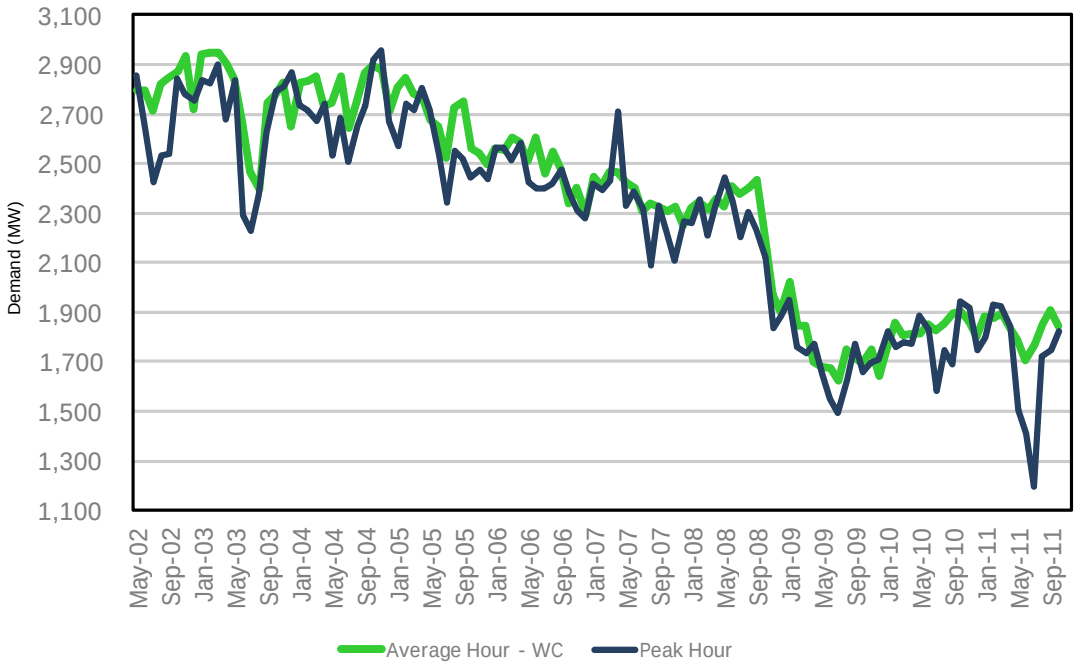


Figure 3.5 shows the average hourly consumption by wholesale customers for the week before the heat wave, the week of the heat wave and the week following. Additionally, a line is added for the actual peak day (July 21st). This graph gives a sense of the response from grid connected Class A customers as a result of the change in the Global Adjustment. The impact during the week of the heat wave appears to be in the range of 200-300 MW and the impact for the peak day is higher still at roughly 400-500 MW. Roughly two-thirds of the Class A load is directly connected, so there would be additional response from the third who are served by LDC's.

Table 3.3 shows the actual and weather-corrected weekly peak demand for the past six months.

Figure 3.5: Wholesale Consumers' Consumption – July 2011

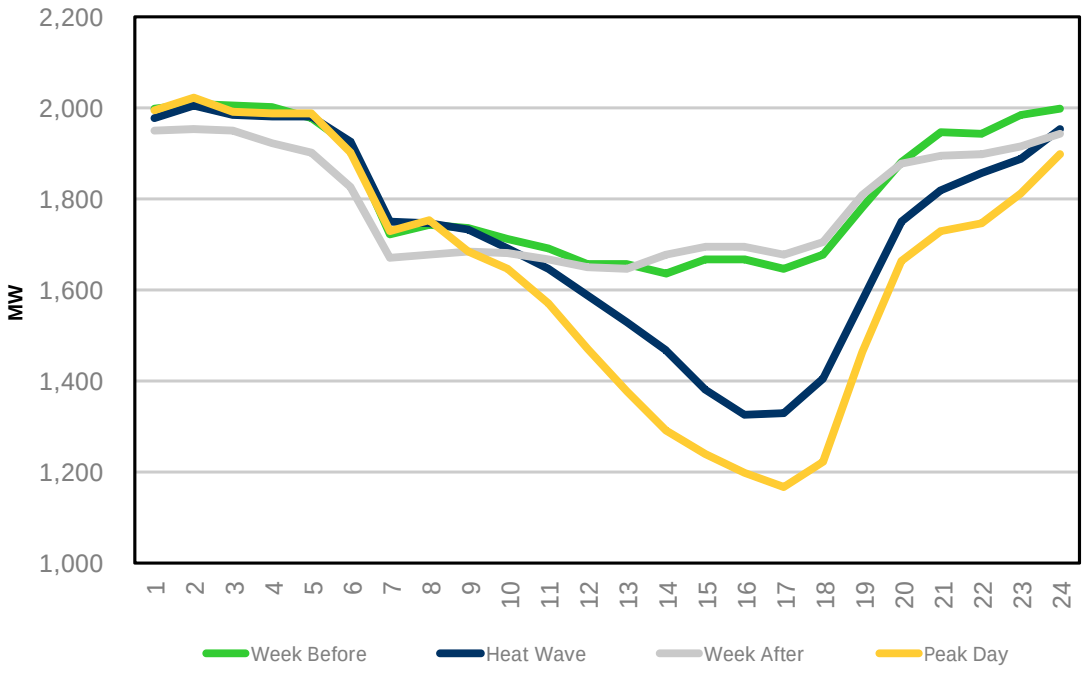


Table 3.3: Weekly Peak Demand

Week Number	Week Ending	Peak Day	Actual Peak (MW)	Weather Corrected Peak (MW)	Peak Day Temperature
18	08-May-11	Tue-May-3	17,128	17,187	7.0
19	15-May-11	Fri-May-13	16,480	16,675	25.8
20	22-May-11	Mon-May-16	16,782	16,639	10.2
21	29-May-11	Thu-May-26	16,733	16,538	20.2
22	05-Jun-11	Tue-May-31	20,847	19,815	29.3
23	12-Jun-11	Wed-Jun-8	22,765	21,900	33.3
24	19-Jun-11	Thu-Jun-16	18,807	18,228	24.7
25	26-Jun-11	Tue-Jun-21	19,985	20,924	25.6
26	03-Jul-11	Tue-Jun-28	19,977	20,869	26.3
27	10-Jul-11	Wed-Jul-6	21,326	20,086	29.2
28	17-Jul-11	Tue-Jul-12	22,739	21,698	31.7
29	24-Jul-11	Thu-Jul-21	25,450	23,501	37.5
30	31-Jul-11	Fri-Jul-29	21,567	20,699	31.4
31	07-Aug-11	Tue-Aug-2	22,051	21,833	31.3
32	14-Aug-11	Mon-Aug-8	21,794	21,623	26.2
33	21-Aug-11	Thu-Aug-18	21,420	21,698	29.9
34	28-Aug-11	Wed-Aug-24	19,979	19,614	27.9
35	04-Sep-11	Fri-Sep-2	21,552	21,284	28.3
36	11-Sep-11	Fri-Sep-9	18,205	18,423	25.2
37	18-Sep-11	Mon-Sep-12	20,157	19,274	28.5
38	25-Sep-11	Wed-Sep-21	18,217	17,863	21.7
39	02-Oct-11	Mon-Sep-26	18,537	18,023	24.1
40	09-Oct-11	Mon-Oct-3	17,481	17,569	14.0
41	16-Oct-11	Wed-Oct-12	18,048	17,478	18.1
42	23-Oct-11	Wed-Oct-19	17,726	17,702	11.7
43	30-Oct-11	Thu-Oct-27	18,234	18,189	4.7

3.4 Load Duration Curves

Previous demand reports included monthly load duration curves. In this report the switch has been made to seasonal duration curves to present a different view. The seasons are fall (September, October and November), winter (December, January and February), spring (March, April and May) and summer (June, July and August). The following graphs are presented in reverse order with the most recent data (summer) first. The figures are not weather-corrected so the weather will influence the shape of each of the graphs (Figures 3.6 to 3.9).

What is interesting to note in these load duration curves is that for all the seasons where weather's impact is smaller, the curve for the most recent season is invariably at the bottom of the range experienced since market opening. This is a combination of the effects acting to reduce demand – time of use, conservation, demand measures, embedded generation and the economy. The only season where the most recent season is not near the bottom of the range is this past summer. This may be due to the fact that summer is the season where energy demand is most directly impacted by weather. The very hot weather of July helped to push up the load duration curve for the summer of 2011.

Figure 3.6: Summer Load Duration Curve

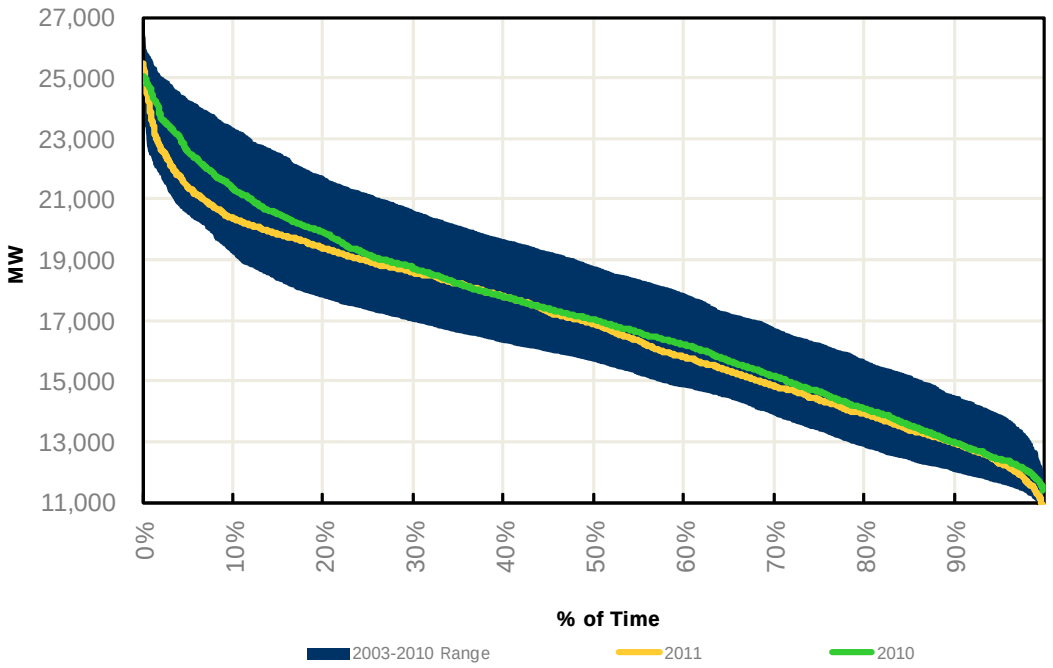


Figure 3.7: Spring Load Duration Curve

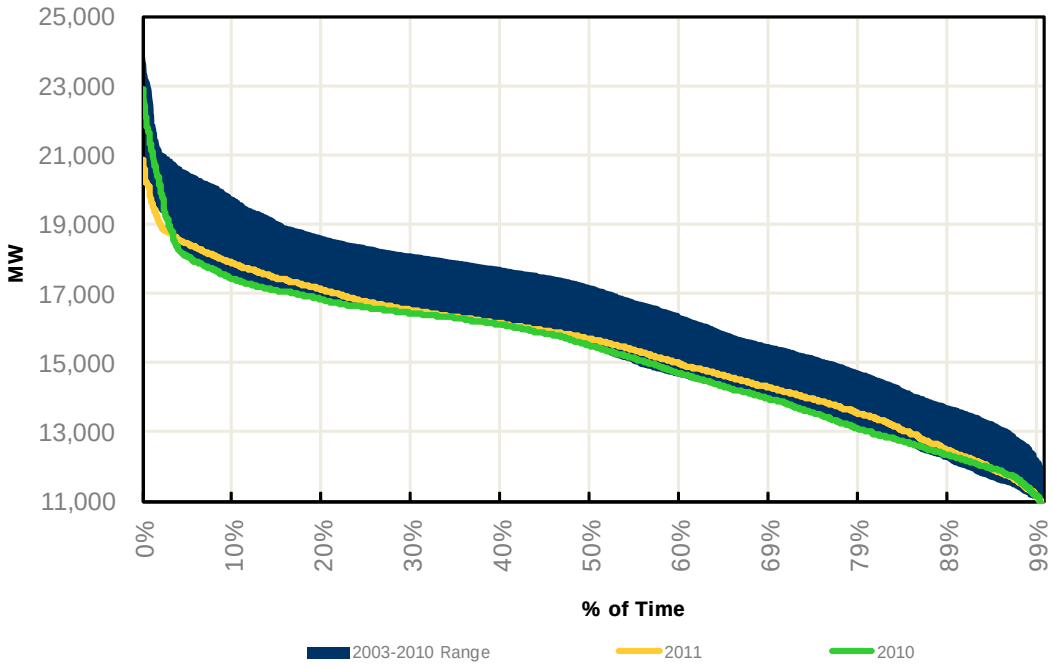


Figure 3.8: Winter Load Duration Curve

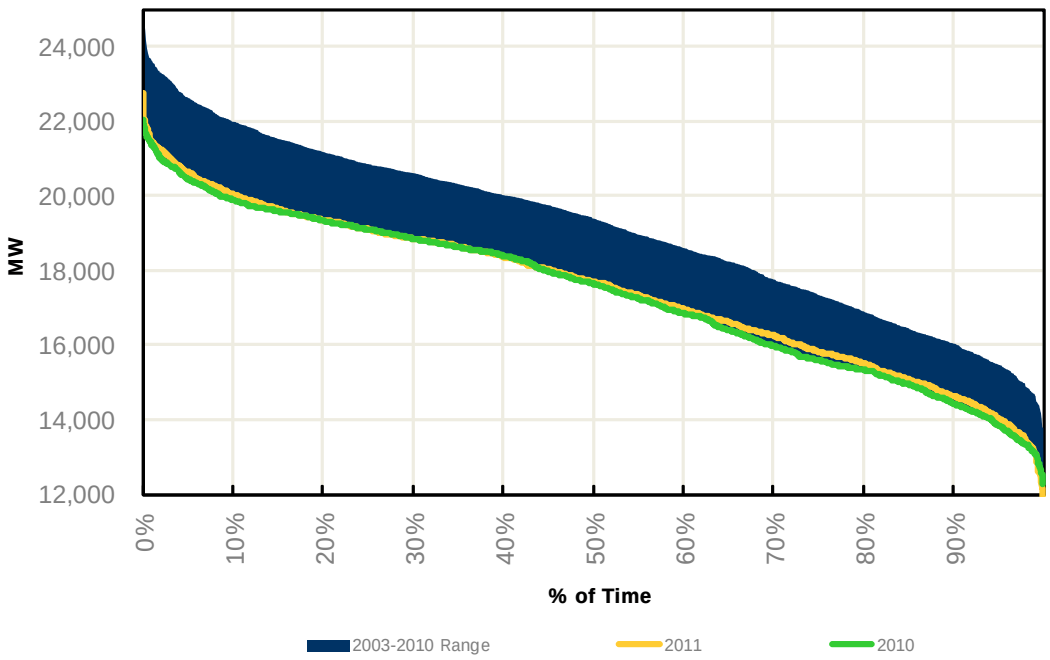
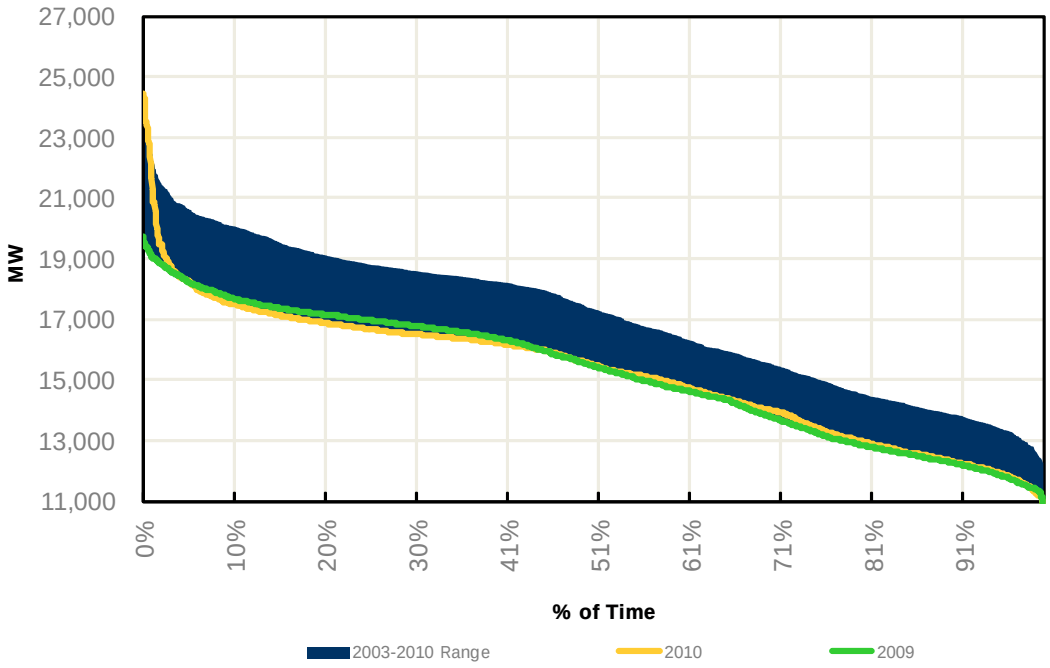


Figure 3.9: Fall Load Duration Curve

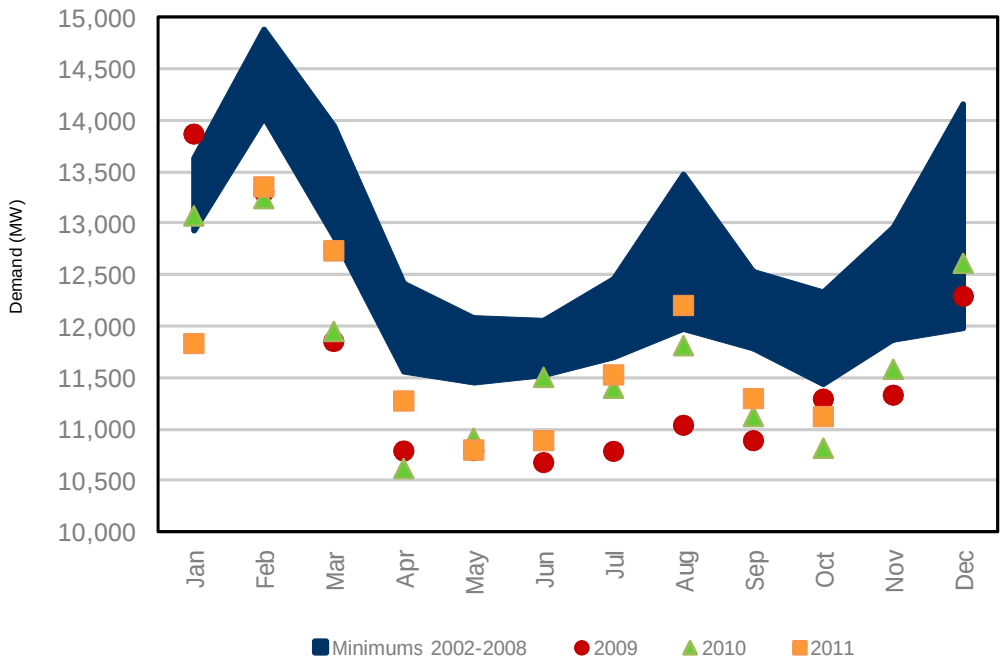


3.5 Historical Minimum Demand

Lower demand levels – once again the results of a combination of factors – have given rise to operational concerns regarding surplus baseload generation. The monthly minimums have dropped over the 2009-2011 timeframe. Except for the winter period when minimum demands are higher, minimums are not driven by weather impacts. Minimums usually occur on weekends or holidays (and, in many cases, holiday weekends) during the early hours of the morning. Figure 3.10 shows the minimum demands for each month since market opening. The band represents the range of values for the years 2002-2008. The individual values are shown for 2009, 2010 and 2011 to date. All of the all-time lows have been set since the onset of the 2009 recession. The all-time low for December was set in 2008 which occurred after the financial crisis triggering the recession. The fall and spring are most representative of true baseload demand as they have minimal weather impact. For 2011, the minimums have been higher than the previous years, the exceptions being January and May. January's minimum was the result of record mild weather on New Year's Day and May's minimum occurred early in the morning of Victoria Day.

The spring and summer are the most challenging times for surplus baseload generation. Spring is challenging in that minimums are low due to the absence of weather drivers and generation gets a boost of production due to melting snow. Summer is challenging as once again minimums are low but most generators are online due to the need for capacity during daytime highs.

Figure 3.10: Monthly Minimum Demands



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4.0 Forecasting Process and Assumptions

A detailed description of the forecasting methodology can be found in the document entitled "Methodology to Perform Long Term Assessments" (IESO_REP_0266) (found on the IESO web site at http://www.ieso.ca/imoweb/pubs/marketReports/Methodology_RTAA_2011nov.pdf).

The form and structure of the model have been modified to enhance and strengthen the explanatory powers of the economic drivers, conservation and embedded generation. The most recent demand, weather and economic data were incorporated into the model, which was re-estimated based on this information.

The forecast of demand requires inputs and this section covers each class of drivers.

4.1 Calendar Drivers for Forecast

Calendar variables are addressed in the Methodology document. Essentially, forecasting demand for electricity according to the calendar – days of the week, holidays, sunrise and sunset – is pretty straightforward.

4.2 Economic Drivers for Forecast

To produce an energy and peak demand forecast, an economic forecast of various drivers is required. The IESO uses both a consensus of publicly available provincial forecasts and purchases forecasts of economic data in order to generate economic drivers for the demand forecast and to provide additional insight and analysis. Table 4.1 summarizes the key economic drivers for the demand forecast. The Ontario growth index is a weighting of the economic drivers as they relate to demand.

Throughout 2011 a number of events - some man-made and some natural - has sent shock waves through the global economy. Though not directly impacted by these events, Ontario has not been immune to the repercussions. The European sovereign debt crisis and sluggish U.S. growth have impacted Ontario's export-oriented economy. In the U.S., high personal and public debt levels, high unemployment levels and slow job growth have led to deteriorating consumer confidence. Low confidence and high debt has translated into lower consumer spending and with the consumer representing nearly two-thirds of the economy leads to slow economic growth. Unfortunately, slow growth is not going to alleviate the high levels of unemployment and governments have very few stimulus options as debt levels limit spending, interest rates cannot be lowered further and currency devaluation (printing money) can only take you so far. The net result is that growth is going to remain low for the foreseeable future as governments and people make up for past spending.

Although none of Ontario's industries have rebounded to pre-recession levels some have shown growth over the 2010-11 timeframe. However, from an electricity demand perspective the industries that are lagging are the electrically intense ones. This means that electricity growth will lag economic growth.

Despite the rather somber tone, much of the risk to the economic forecast remains on the downside as the debt issues present many challenges. Table 4.1 contains the summary of key economic drivers.

Table 4.1: Forecast of Ontario Economic Drivers

Year	Ontario Employment		Ontario Housing Starts		Ontario Growth Index	
	Thousands	Annual Growth (%)	Thousands	Annual Growth (%)	Index	Annual Growth (%)
1995	5,098	2.0	31.9	-23.3	1.025	1.42
1996	5,161	1.2	39.5	23.9	1.036	1.05
1997	5,277	2.3	50.0	26.5	1.054	1.69
1998	5,440	3.1	50.1	0.2	1.077	2.18
1999	5,621	3.3	62.9	25.6	1.102	2.34
2000	5,801	3.2	67.4	7.1	1.128	2.39
2001	5,924	2.1	70.3	4.2	1.150	1.88
2002	6,014	1.5	79.6	13.3	1.169	1.65
2003	6,203	3.1	80.9	1.7	1.198	2.49
2004	6,310	1.7	79.9	-1.3	1.219	1.78
2005	6,390	1.3	73.2	-8.4	1.237	1.49
2006	6,485	1.5	67.8	-7.4	1.256	1.53
2007	6,585	1.6	62.8	-7.4	1.275	1.47
2008	6,686	1.5	71.9	14.6	1.294	1.50
2009	6,535	-2.3	47.9	-33.3	1.286	-0.63
2010	6,632	1.5	57.5	20.0	1.303	1.34
2011 (f)	6,753	1.8	62.7	8.9	1.323	1.56
2012 (f)	6,824	1.1	57.9	-7.5	1.338	1.12
2013 (f)	6,919	1.4	49.6	-14.4	1.354	1.20

4.3 Weather Drivers for Forecast

Since forecasting long-term weather is not possible, weather scenarios are generated using historical data. The analytical studies that the IESO produces serve a variety of purposes and needs. As such, a variety of inputs are required. Therefore the IESO produces demand forecasts based on a number of different weather scenarios. The most commonly utilized scenarios are Normal and Extreme.

The weather scenarios are generated using the following steps:

- For each day over the past 31 years a "weather factor" is calculated based on the weather conditions of that day (temperature, wind speed, cloud cover and humidity). This weather factor represents the MW impact on demand if those weather conditions were observed in the forecast horizon.
- The daily weather factors are sorted from highest to lowest for each month.
- Normal weather is based on the median value of the sorted weather factors across the 31 years of history. For example, the median value of the maximum weather factor from each January from 1980 to 2010 would be the first value for the normal January. The median value of the second highest weather factor from each January from 1980 to 2010 would be the second day in the normal January. This is repeated until all days in the month are generated. Once the normal months are created they are mapped to the calendar based on the weekly average

distribution of weather. The weekly peak eliciting weather is always mapped to Wednesday to ensure that peaks do not occur on weekends or holidays.

- Extreme weather is generated in a similar manner except that we use the maximum, rather than the median value from the sorted data.

Load Forecast Uncertainty (LFU) - a measure of demand fluctuations due to weather variability - is a critical part of the analysis. In conjunction with the Normal weather forecast, LFU is valuable in determining a distribution of potential outcomes under various weather conditions. The resource adequacy assessments use the Normal weather forecast in combination with LFU to consider a full range of peak demands that can occur under various weather conditions with varying probability of occurrence.

The Extreme weather scenario is valuable for studying situations where the system is under duress. The Extreme weather scenario is useful when examining peak conditions but is unrealistic from an energy demand standpoint, as severe weather conditions do not persist over a long time period.

The 18-Month Outlook Tables spreadsheet includes Table 3.3.5, which has the Normal and Extreme weather scenarios. For each week, the table shows the historical weather used for the peak day of that week. The table shows the daily high (temperature) and wind speed. Not shown but used in forecasting demand are humidity and cloud cover. The IESO uses six weather stations in the demand models – the data in the table is for Toronto. The weather scenarios were updated for data through the end of December 2010.

4.4 Conservation and Demand Management

Conservation and demand management within the Outlook are broken into three categories: conservation, embedded generation and demand management. Conservation includes energy efficiency programs, conservation behaviour, fuel switching and the impacts of smart meters. Embedded generation refers to load-displacing generation that is located on the Market Participants' side of the meter. This would include all generation under the Renewable Energy Standard Offer Program (RESOP) and some generation under the Green Energy Act's Feed-in Tariff (FIT). Demand management includes the OPA's demand response programs and the IESO's dispatchable loads. These groups will impact demand throughout the forecast.

Projected conservation numbers are provided to the IESO by the Ontario Power Authority (OPA). These projections are based on existing and future programs. Projected conservation impacts are decremented from demand.

Information on embedded generation is factored into the forecast. Embedded generation will displace demand that would normally have been met through the grid. Although the actual demand for electricity is unaltered, the source of supply will not be from the grid. Therefore the impacts of embedded generation are decremented from the forecast.

Demand response capacity projections are also provided by the OPA. Demand management programs represent a demand reduction that will be dispatched like a resource or generator. Conceptually, these programs represent capacity that can be called on when needed. Therefore, demand management is treated as a resource with a capacity value in MW. Adjustments are made based on historical data for the amount of demand management that is deemed to be reliably available.

Over the course of the forecast, the amount of conservation and demand management are expected to increase. Conservation - at the time of the winter peak - is expected to grow by 85 MW. Embedded generation's available capacity at the time of winter peak is expected to grow by 70 MW over the outlook timeframe. Lastly, demand management programs are projected to increase their reliably available capacity from 1,168 MW to 1,330 MW over the course of the forecast horizon.

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