18-MONTH OUTLOOK

From June 2010 to November 2011

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Power to Ontario. On Demand.

Ontario Demand Forecast

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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 demand forecast for the period from June 2010 to November 2011 and supersedes the previous forecast released in February 2010.

Economic Outlook

Though the global credit crisis and ensuing recession are behind us, the current recovery period presents a number of challenges. High national debt loads and the prospect of higher interest rates have acted as a damper on growth during this recovery period. Here are the key economic issues for the 18-Month Outlook:

- Exchange Rate – Canada's healthy financial sector and relatively small debt load has led to a higher dollar. Unfortunately, a high dollar works against Ontario's export oriented manufacturing sector. On the plus side, a strong dollar affords the Bank of Canada leeway in setting interest rates perhaps allowing them to remain lower, longer.
- Fragile Recovery – High national debt loads have raised concerns about higher interest rates and the prospect of defaults. These concerns undermine confidence and act to slow global growth.
- Changing Economy – Ontario's economy has undergone both cyclical and structural change. As Ontario approaches its pre-recession GDP peak, the composition of the economy will have changed as the relative size and share of certain industries or economic segments will have changed.

Actual Weather and Demand

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

<u>February</u>

- The weather for February was milder than normal. The average temperature ranked February as the 28th coldest in the last 41 years. However, the coldest day was the warmest in the past 41 years as the peak day afternoon high was -6.5°C, well above the median of -12.3°C and all-time low of -19.3°C.
- Actual peak demand for February was 21,367 MW and occurred on February 1st the coldest day of the month. The weather was mild so the weather corrected peak was higher (22,277 MW). These peaks are comparable to those in February 1999.
- Actual energy demand for the month was 11.8 TWh and the weather-corrected energy demand was 11.9 TWh. Both these figures are slightly higher than last February.

- Wholesale industrial energy demand was 0.4% higher than the previous February. This was the first year over year growth since September 2008.

March

- March's weather was the mildest in 40 years. The peak occurred on the second coldest day which had an afternoon high of 2.6°C. Only one day in March had a daily high less than zero (-0.5°C). The March median peak day has a temperature of -7.5°C.
- The peak for March was 19,393 MW the lowest March value since March 1985. The weather-corrected peak was 20,977 MW a slight increase on March 2009.
- Actual energy demand for the month was 11.7 TWh (12.2 TWh weather corrected). The actual was the lowest March since 1987 but the weather corrected value was a slight improvement over March 2009.
- Wholesale industrial customers' consumption dropped 2.1% compared to the previous March.

April

- April's weather was extremely mild, setting records for temperatures and lack of precipitation. The monthly peak occurred on the coldest day of the month which had a daytime high of 4.8°C – well above the normal peak day temperature of 0.7°C.
- The peak for April was 17,398 MW the lowest value since April 1986. The weather corrected value of 19,462 MW was the lowest April value since 1995.
- Actual energy demand for the month was 10.5 TWh (11.2 TWh weather corrected). This is the lowest demand since April 1994 and the lowest weather corrected energy since April 1998.
- On the positive side, wholesale industrial customers' consumption grew by 6.6% on a year over year basis. This is the largest increase since July 2004.

Overall, the weather experienced so far this year has been significantly milder than normal. Combined with lower demand levels due to the economy, monthly demands are at levels not seen in twenty years. After adjusting for weather, the demand levels are roughly similar to those experienced ten years ago.

Demand for the first four months is 2.7% lower than the same period for 2009. However after correcting for the unseasonal weather, demand showed a slight increase of 0.5% for the four month period. For wholesale customers electricity demand is down 2.6% from 2009. However, if we exclude January – which was down 13.1% on a year over year basis – demand for the last three months has increased by 1.5% over the same period in 2009. The figures could have been better as a large wholesale customer is involved in a protracted labour dispute which has significantly lowered their consumption.

Demand Forecast

The 18-Month Outlook contains a forecast of demand which includes the impact of additional conservation savings and demand reductions from projected off-grid generation.

The Ontario Power Authority (OPA) and local distribution companies (LDC) continue to take actions that reduce demand. In the 18-Month Outlook the impacts of conservation and off-grid generation are decremented from demand, whereas the OPA's demand response programs are included in our analysis as a resource. Conservation, off-grid 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 are expected to remain fairly flat over the forecast horizon as conservation, embedded generation and time of use prices offset the demand growth attributable to the economic recovery and an increasing stock of buildings.

Energy demand is expected to show slight increases over the next two years. Demographic and economic growth will drive demand higher despite increased conservation and embedded generation.

Table 1: Peak and Energy Demand Forecast

Season	Normal Weather Peak (MW)	Extreme Weather Peak (MW)
Summer 2010	23,498	25,998
Winter 2010-11	22,473	23,782
Summer 2011	23,464	25,938
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 (Forecast)	142.2	1.3%
2011 Energy (Forecast)	143.6	1.0%

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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 June 2010 to November 2011. It supersedes the previous forecast released February 2010.

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 web site at http://www.ieso.ca/imoweb/pubs/marketReports/Methodology_RTAA_2010may.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 February 2010. Data for March and April 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_2010may.xls) spreadsheet posted alongside the Outlook documents. Additional tables are also included in the spreadsheet. Having a separate spreadsheet allows for historical data right back to market opening. That 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 or to forecasts.demand@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 has 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)
06-Jun-10	19,627	24,549	1,570	2,563	06-Mar-11	21,084	21,911	345	2,892
13-Jun-10	19,984	23,359	1,645	2,554	13-Mar-11	20,497	22,169	721	2,845
20-Jun-10	21,663	24,520	1,042	2,678	20-Mar-11	19,981	21,395	803	2,821
27-Jun-10	22,551	25,435	1,507	2,727	27-Mar-11	19,461	21,050	916	2,757
04-Jul-10	21,907	24,680	1,376	2,680	03-Apr-11	19,071	20,499	742	2,626
11-Jul-10	22,493	24,383	1,227	2,800	10-Apr-11	18,661	20,422	952	2,615
18-Jul-10	23,114	24,985	973	2,791	17-Apr-11	18,203	19,678	830	2,567
25-Jul-10	23,498	25,998	1,354	2,907	24-Apr-11	17,977	21,981	813	2,483
01-Aug-10	23,091	25,069	932	2,845	01-May-11	17,497	21,805	838	2,485
08-Aug-10	22,106	25,005	1,068	2,773	08-May-11	17,486	21,114	902	2,483
15-Aug-10	22,973	25,931	1,095	2,827	15-May-11	18,044	22,180	312	2,451
22-Aug-10	22,913	25,201	949	2,806	22-May-11	18,262	21,769	895	2,497
29-Aug-10	21,716	24,707	1,072	2,744	29-May-11	18,692	22,826	1,347	2,447
05-Sep-10	21,583	24,667	1,241	2,720	05-Jun-11	19,660	24,529	1,545	2,564
12-Sep-10	20,696	24,756	1,616	2,592	12-Jun-11	19,708	23,002	1,305	2,535
19-Sep-10	19,982	25,032	1,540	2,574	19-Jun-11	21,420	24,221	1,022	2,645
26-Sep-10	19,240	24,084	1,520	2,564	26-Jun-11	22,254	25,077	1,475	2,686
03-Oct-10	18,644	22,616	476	2,523	03-Jul-11	21,794	24,516	1,351	2,673
10-Oct-10	18,062	22,741	719	2,541	10-Jul-11	22,318	24,176	1,207	2,792
17-Oct-10	18,251	19,330	519	2,515	17-Jul-11	22,987	24,833	960	2,779
24-Oct-10	18,552	19,648	552	2,587	24-Jul-11	23,464	25,938	1,438	2,885
31-Oct-10	18,913	19,841	566	2,633	31-Jul-11	23,073	25,035	927	2,834
07-Nov-10	19,123	20,061	824	2,633	07-Aug-11	21,873	24,725	1,047	2,730
14-Nov-10	19,796	20,807	683	2,681	14-Aug-11	22,765	25,870	1,077	2,775
21-Nov-10	20,449	21,581	495	2,744	21-Aug-11	22,864	25,133	943	2,747
28-Nov-10	20,713	22,110	833	2,786	28-Aug-11	21,467	24,402	1,052	2,706
05-Dec-10	20,801	22,655	761	2,822	04-Sep-11	21,504	24,372	1,216	2,747
12-Dec-10	21,708	22,936	554	2,904	11-Sep-11	20,453	24,449	1,588	2,591
19-Dec-10	21,971	22,997	261	2,910	18-Sep-11	19,713	24,604	1,448	2,548
26-Dec-10	21,090	22,258	505	2,858	25-Sep-11	19,048	23,742	1,423	2,528
02-Jan-11	21,007	22,417	516	2,768	02-Oct-11	18,608	22,324	803	2,485
09-Jan-11	21,779	22,947	661	2,951	09-Oct-11	17,817	22,306	636	2,538
16-Jan-11	22,150	23,468	565	2,977	16-Oct-11	18,249	19,298	495	2,531
23-Jan-11	22,473	23,565	581	3,040	23-Oct-11	18,442	19,653	645	2,614
30-Jan-11	22,373	23,782	395	3,008	30-Oct-11	18,876	19,718	741	2,667
06-Feb-11	22,243	23,296	336	3,025	06-Nov-11	19,105	19,984	765	2,663
13-Feb-11	21,741	22,873	433	2,976	13-Nov-11	19,523	20,679	821	2,680
20-Feb-11	21,588	22,642	486	2,955	20-Nov-11	20,159	21,443	734	2,736
27-Feb-11	21,126	22,590	507	2,925	27-Nov-11	20,586	21,971	808	2,780

Compared to the previous forecast, peak demands are lower in the front half of the forecast but the same or higher later on. Energy demand is higher for both 2010 and 2011. 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

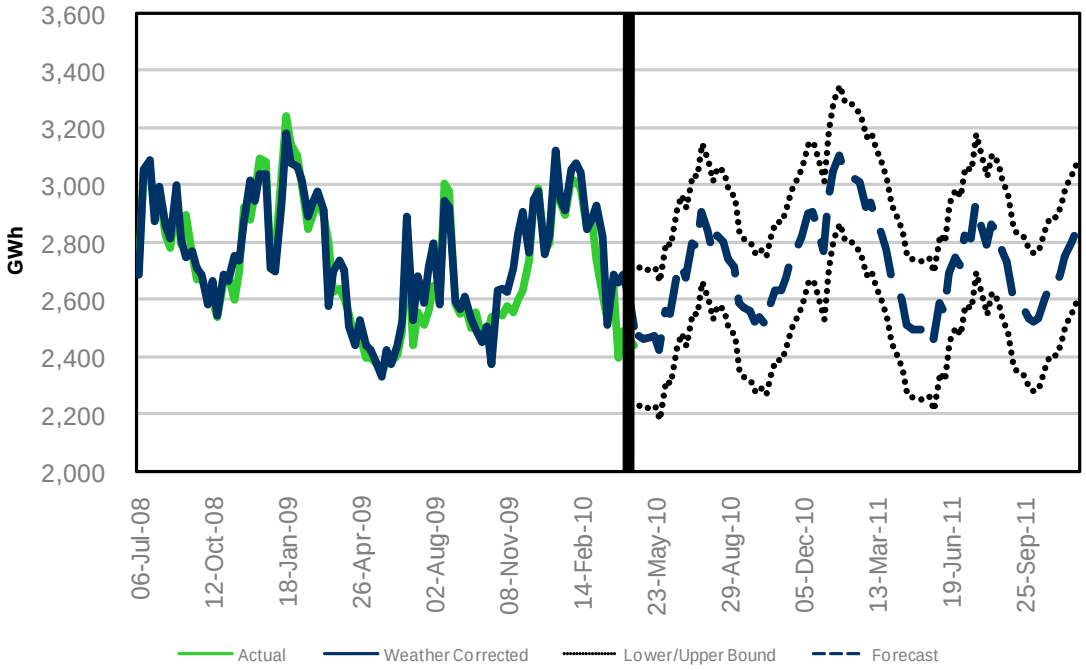
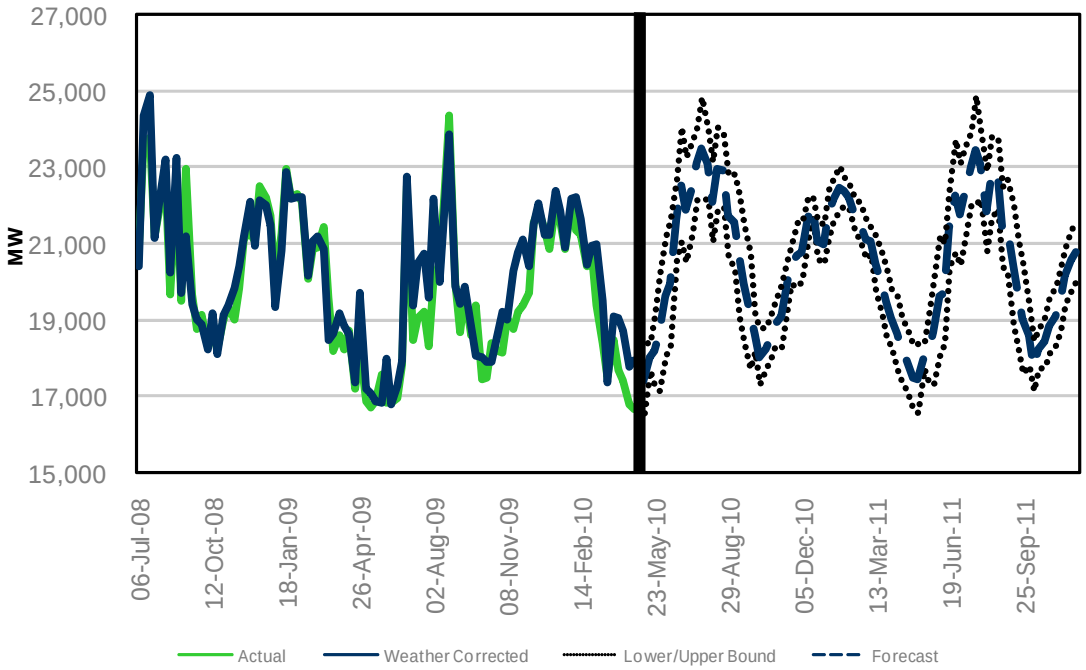


Figure 2.2: Weekly Peak Demand – History and Forecast



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3.0 Historical Review

This section covers historical energy and peak demand. The weather-corrected numbers are generated based on Normal weather.

3.1 January to April Review

The weather was milder than normal throughout the start of 2010. Demand has been low due to the combination of weather and the economy. Most of the actual monthly peaks and energy demand were lower than expected. Weather-correction eliminates much of the difference. Table 3.1 contains a summary of the weather and demand for the past four months. Table 3.3.2 of the 18-Month Outlook Tables spreadsheet contains similar information going back to market opening.

Table 3.1: Historical 2010 Weather and Demand Summary

Historical Analysis		January	February	March	April
Actual	Average Temperature (°C)	-2.6	-0.7	8.7	15.4
	Minimum Temperature (°C)	-10.8	-6.2	0.6	3.6
	Maximum Temperature (°C)	6.1	4.3	18.7	23.0
Monthly Normal	Normal Average Temperature (°C)	-3.3	-1.5	3.6	10.7
	Normal Minimum Temperature (°C)	-13.5	-13.5	-5.5	2.8
	Normal Maximum Temperature (°C)	6.7	8.2	16.7	25.0
Actual	Peak Demand (MW)	22,045	21,367	19,393	17,398
	Average Hour (MW)	17,669	17,488	15,707	14,548
	Minimum Hour (MW)	13,075	13,243	11,951	10,618
	90th Percentile (MW)	20,120	19,688	17,745	16,557
	Percent above 20,000 (MW)	11.3%	6.8%	0.0%	0.0%
	# of Hours Above 20,000 (MW)	84	46	0	0
	Energy Demand (GWh)	13,146	11,752	11,686	10,475
Weather Corrected	Peak Demand (MW)	22,378	22,216	20,977	19,074
	Energy Demand (GWh)	13,286	11,864	12,187	11,156
Forecast	Peak Demand (MW)	22,717	22,460	21,309	18,771
	Energy Demand (GWh)	13,098	11,804	12,431	10,858

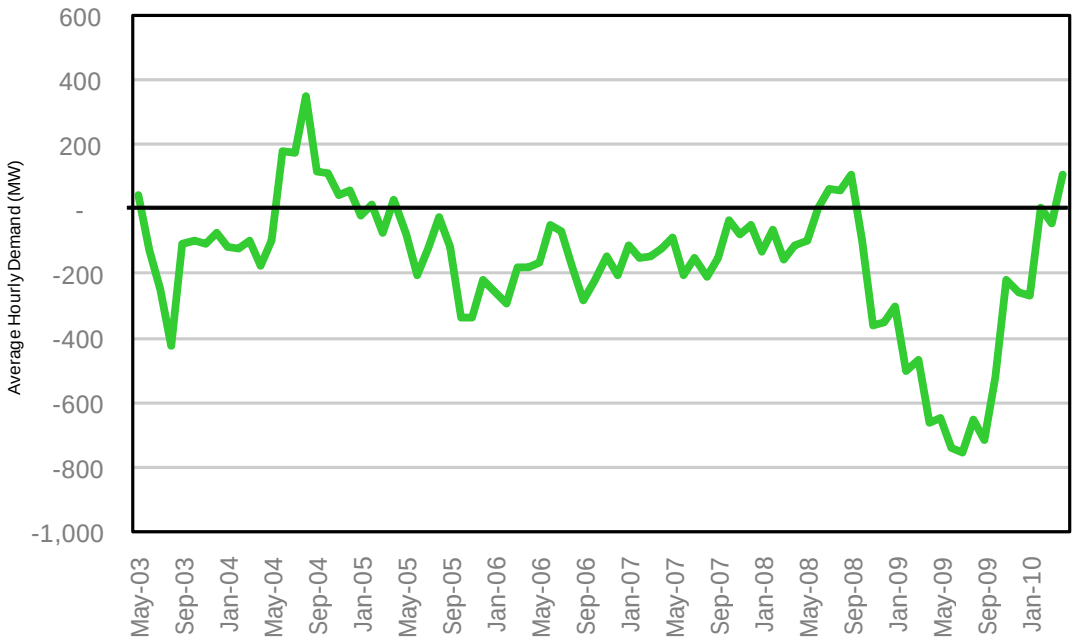
Notes for Table 2.1 – Weather is for Toronto. Temperature is the daily high. Forecast is the most recent for that period.

3.2 Historical Energy Demand

Actual energy demand was 2.7% lower for the first four months compared to a year earlier. After adjusting for the very mild weather demand was 0.5% higher than the same months of 2009. The unseasonable weather has masked the beginnings of a recovery in electricity demand. Electricity demand had been virtually flat since the first quarter of 2009.

Figure 3.1 shows the year over year change in wholesale customers' consumption. Consumption has been on a downward trend since the spring of 2005, a result of the appreciating Canadian dollar. The financial crisis and ensuing recession are clearly evident in the graph. During the latter half of 2009 consumption stabilized, and as of February wholesale consumption has started to show year over year increases. Wholesale customers' average hourly consumption is still roughly 600 MW lower than prior to the recession but it is back up about 150 MW from the lows of 2009. Wholesale consumption for the first four months was down 2.6% over the previous year – however if we look at just the past three months consumption has increased 1.5%.

Figure 3.1: Wholesale Customer's Year over Year Change in Consumption



Overall energy demand has followed a similar path to that of the industrial sector. Though not as volatile, energy demand has been declining or flat 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 grid.

Figure 3.2 displays a moving average of weekly demand. The graph depicts the general decline in energy demand since the summer of 2005 and the steep decline due to the recession. The tail end has the actual and weather corrected lines diverging due to the extremely mild March and April of 2010. The weather has hidden the beginnings of a reversal in demand.

Table 3.2 contains the weekly energy demand for the past three 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.

Figure 3.2: Energy Demand – 52 Week Moving Average

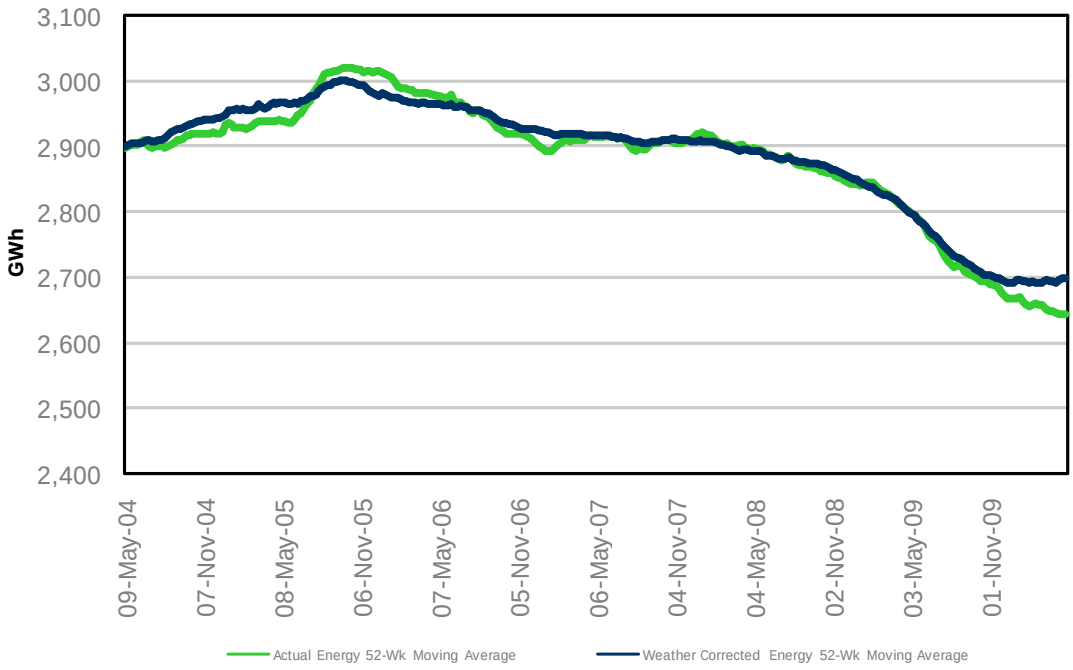


Table 3.2: Historical Weekly Energy Demand

Week Number	Week Ending	Peak Day	Actual Energy (GWh)	Corrected Energy (GWh)	Notes
5	07-Feb-10	01-Feb-10	3,016	3,083	
6	14-Feb-10	09-Feb-10	2,992	3,049	
7	21-Feb-10	17-Feb-10	2,851	2,851	Family Day
8	28-Feb-10	25-Feb-10	2,893	2,881	
9	07-Mar-10	01-Mar-10	2,740	2,930	
10	14-Mar-10	10-Mar-10	2,623	2,822	
11	21-Mar-10	15-Mar-10	2,536	2,511	
12	28-Mar-10	25-Mar-10	2,654	2,688	
13	04-Apr-10	29-Mar-10	2,405	2,664	Good Friday
14	11-Apr-10	09-Apr-10	2,494	2,691	Easter Monday
15	18-Apr-10	16-Apr-10	2,460	2,608	
16	25-Apr-10	22-Apr-10	2,446	2,510	

3.3 Historical Peak Demand

Peak demands are generally weather driven events. Peak demands have been eroded by declining baseload demand as a result of the recession. In much the same way that weekends and holidays will blunt the impact of extreme weather events the recession has had a dampening impact on peak demands. Figure 2.4 shows the wholesale customers consumption at the time of

the monthly peak. The graph clearly shows the significant drop experienced during the recession but also the slight increase over the past few months. Since the onset of the financial crisis and ensuing recession it would appear that wholesale customers' hourly average consumption had fallen by nearly 750 MW. Since the summer, hourly loads appear to have risen by roughly 150 MW.

Figure 3.3: Wholesale Customers Coincident Peak and Average Hourly Consumption

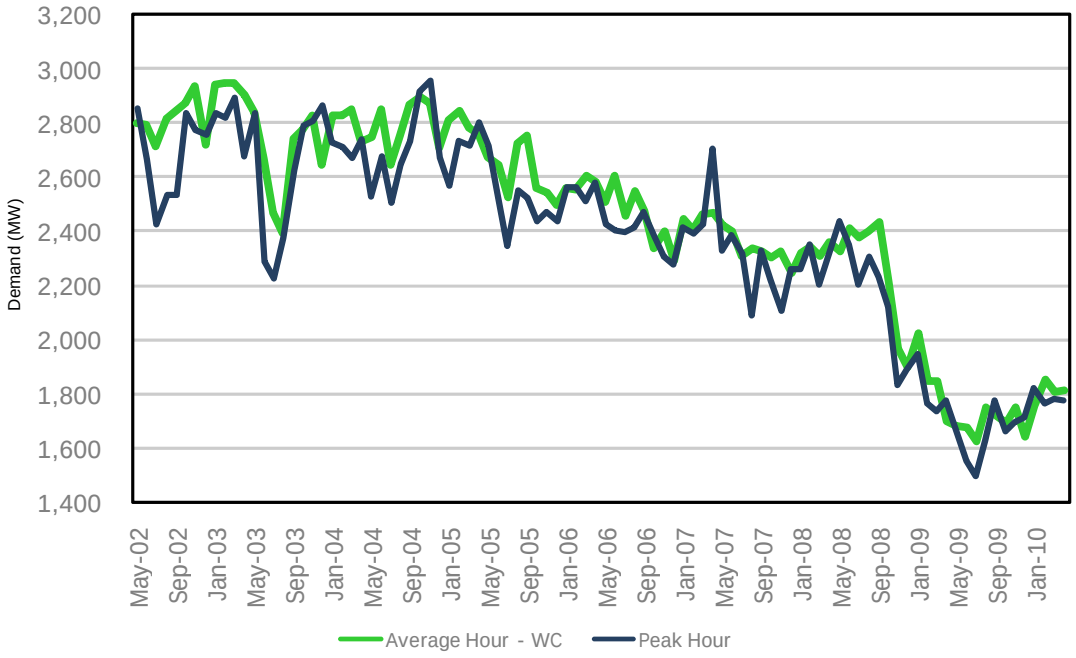
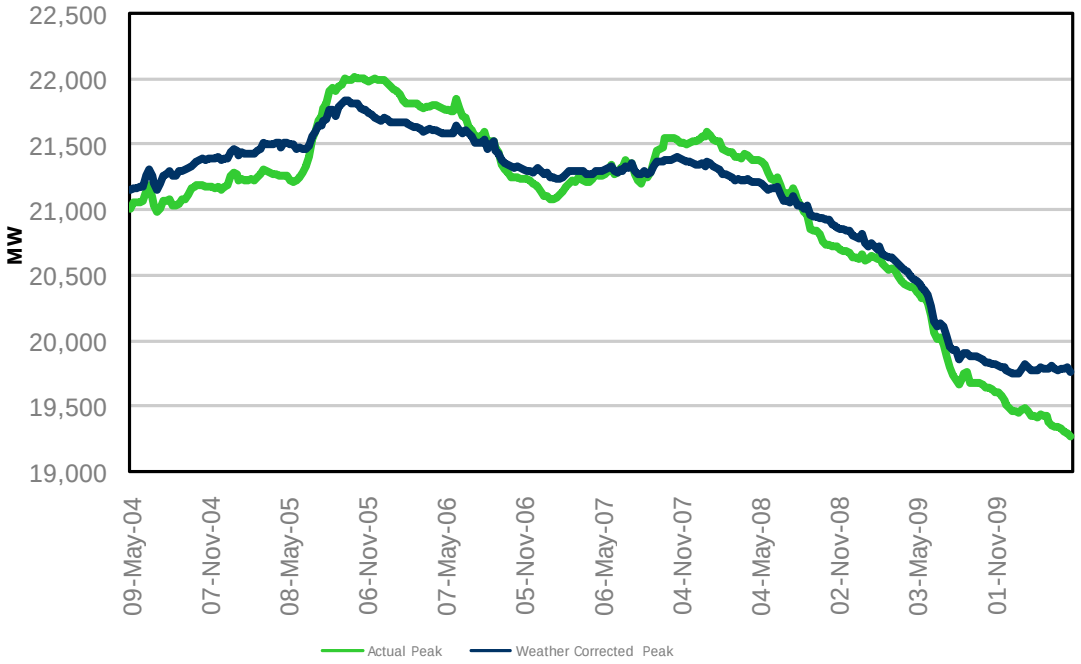


Figure 3.4: Peak Demand – 52 Week Moving Average



The same decline can be seen at the system level. Figure 3.4 shows the 52-week moving-average of peak demand. A similar drop of roughly 1,000 MW is evident. Demand at the tail end has been relatively flat.

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

Table 3.3: Weekly Peak Demand

Week Number	Week Ending	Peak Day	Actual Peak (MW)	Weather Corrected Peak (MW)	Peak Day Temperature
5	07-Feb-10	Mon-Feb-1	21,367	22,216	-3.6
6	14-Feb-10	Tue-Feb-9	21,240	21,657	-3.9
7	21-Feb-10	Wed-Feb-17	20,431	20,467	0.4
8	28-Feb-10	Thu-Feb-25	20,748	20,963	-5.8
9	07-Mar-10	Mon-Mar-1	19,393	20,977	2.0
10	14-Mar-10	Wed-Mar-10	18,396	19,506	8.8
11	21-Mar-10	Mon-Mar-15	17,480	17,370	12.1
12	28-Mar-10	Thu-Mar-25	18,490	19,101	8.6
13	04-Apr-10	Mon-Mar-29	17,717	19,075	8.4
14	11-Apr-10	Fri-Apr-9	17,398	18,721	3.6
15	18-Apr-10	Fri-Apr-16	16,784	17,774	20.6
16	25-Apr-10	Thu-Apr-22	16,674	17,943	12.3

3.4 Load Duration Curves

The following graphs illustrate the load duration curves for February, March and April for the past three years. The weather and economic influences are evident in each of the graphs.

Figure 3.5: February Load Duration Curve

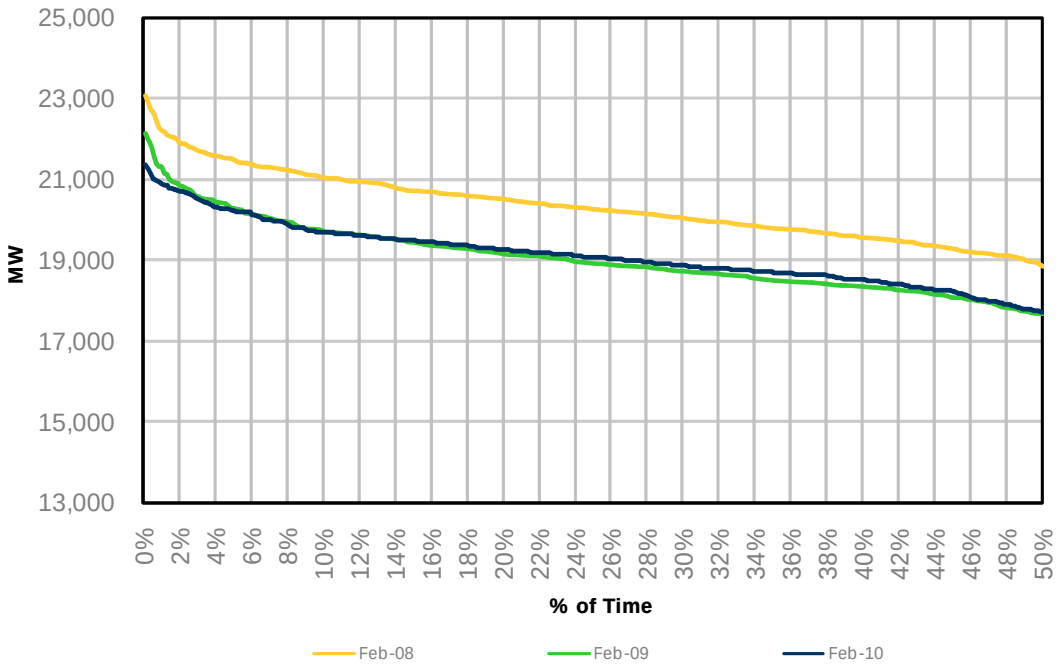


Figure 3.6: March Load Duration Curve

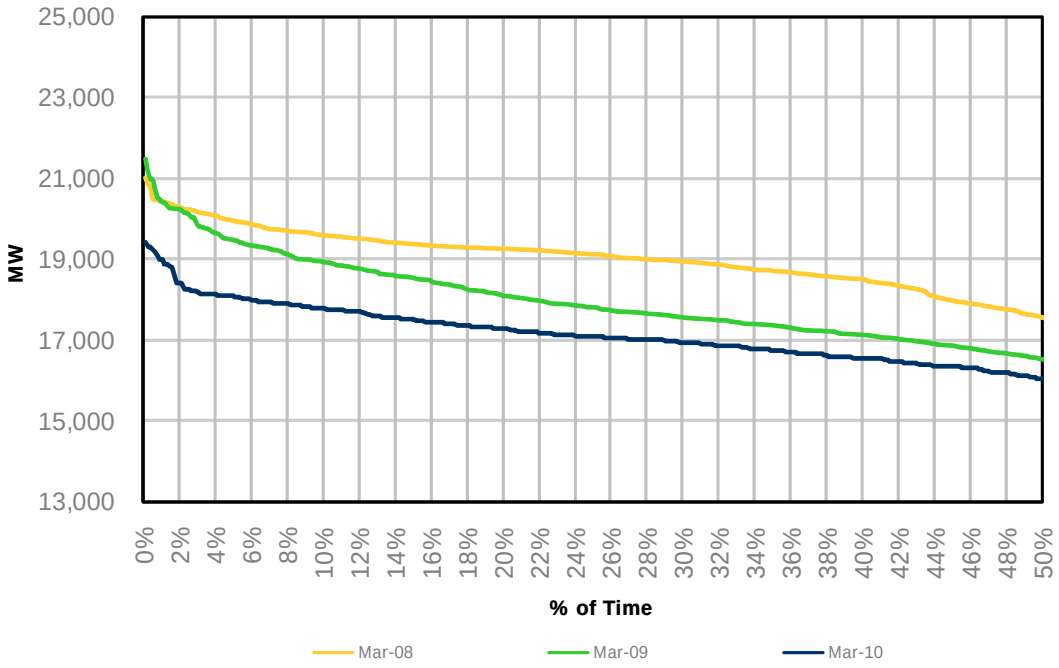
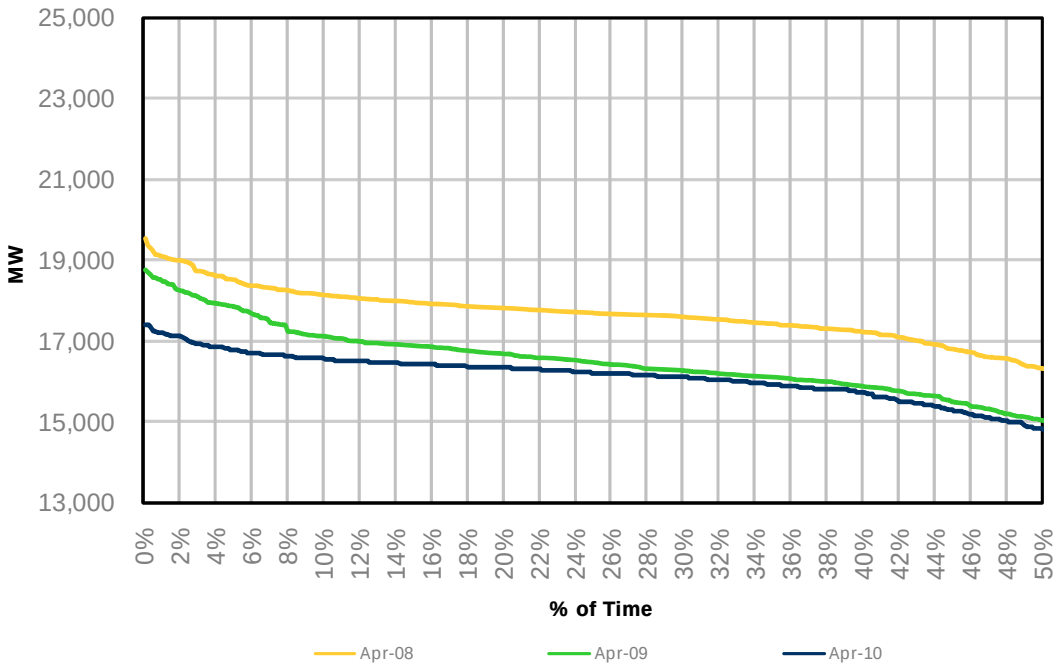


Figure 3.7: April Load Duration Curve



The February load duration curves show the economic impacts as 2009 and 2010 are well below the curve for 2008. March and April 2010 were significantly warmer than normal and that can be seen in the curves. However, at the lower load levels the curves seem to run parallel to but lower than the curves for 2008, highlighting the lower load as a result of the recession.

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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_2010may.pdf..

The form and structure of the model has not changed since the last Outlook. 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 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 a consensus of four publicly available provincial forecasts to generate the economic drivers used in the forecast. The IESO also purchases economic forecasts for 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.

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 (f)	6,602	1.0	55.0	14.7	1.300	1.09
2011 (f)	6,720	1.8	61.1	11.1	1.319	1.52

Over the latter half of 2009 both economic growth and demand remained quite flat. With the start of 2010, it would appear that both have started to pick up. Ontario's export-oriented electricity intense sectors still face two major challenges. With the Canadian dollar at or near parity, Ontario's producers and exporters face stiffer price competition from foreign companies. Secondly, the global recovery remains fragile as high national debt levels in numerous countries undermine confidence and bring the prospect of higher interest rates. Combined this means more competition and potentially lower demand. Stronger global growth will mean greater growth here in Ontario.

The high dollar should allow the Bank of Canada, barring any inflationary pressures, to lag or delay future interest rates hikes. This would allow Canadian companies access to cheaper capital and drive the dollar down at the same time. The Bank of Canada's interest rate policy is largely driven by inflation measures and this will be something to watch over the remainder of the year.

The recession was quite deep in its descent compared to previous recessions. Part of this has been due to very tight inventory control as inventories have declined consistently since October 2008. Although this led to a greater economic decline over the recession it will mean that production will ramp up quicker as demand strengthens since there will not be a surplus of inventory to work off. New orders have only recently – as of November 2009 - started to show some strength and this is reflective of the overall global recovery. As demand strengthens, economic output will increase and electricity consumption will grow.

The fragile nature of the recovery will mean that growth will be slower leading to modest increases in electricity demand for 2010 and 2011. Some of this is due to the return of production in the automotive and steel industries, which experienced periods of shut downs or low production in 2009. Ultimately, this forecast still faces considerable downside risk due to the debt concerns of a number of nations.

4.3 Weather Drivers for Forecast

Since forecasting long-term weather is not possible, weather scenarios are generated based on 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 1978 to 2008 would be the first value for the normal January. The median value of the second highest weather factor from each January from 1978 to 2008 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 2007.

4.4 Conservation and Demand Management

Conservation and demand management within the Outlook are broken into three groups; 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 program. Each of 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 have been met through the grid. Although the 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 peak - is expected to grow by 150 MW. Embedded generation's available capacity at the time peak is expected to grow by 128 MW over the outlook time frame. Lastly, demand management programs are projected to increase their capacity from 699 MW to 1,114 MW.

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