

IESO SUMMER BRIEFING

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Agenda

- Winter and Spring Review
- Outlook for Summer 2015 and Beyond

Ontario System Fast Facts







Installed Capacity	34,367 MW
Record Summer Peak	27,005 MW (August 1, 2006)
Record Winter Peak	24,979 MW (December 20, 2004)
Total Annual Energy Consumed	139.8 TWh (2014)
Customers	4.9 million
Transmission Lines	30,000 km
Interconnections	New York, Quebec, Manitoba, Michigan, Minnesota



Winter and Spring Review

Supply Mix

Transmission-connected installed capacity as of March 2015:

	Nuclear:	12,947 MW or 38%
	Gas/Oil:	9,920 MW or 29%
	Hydro:	8,462 MW or 25%
	Wind:	2,543 MW or 7%
	Biofuel:	455 MW or 1%
	Solar:	40 MW or 0.1%

New resources include:

- Silver Creek Solar Park (10 MW)
- Thunder Bay unit converted to burn biomass (153 MW)



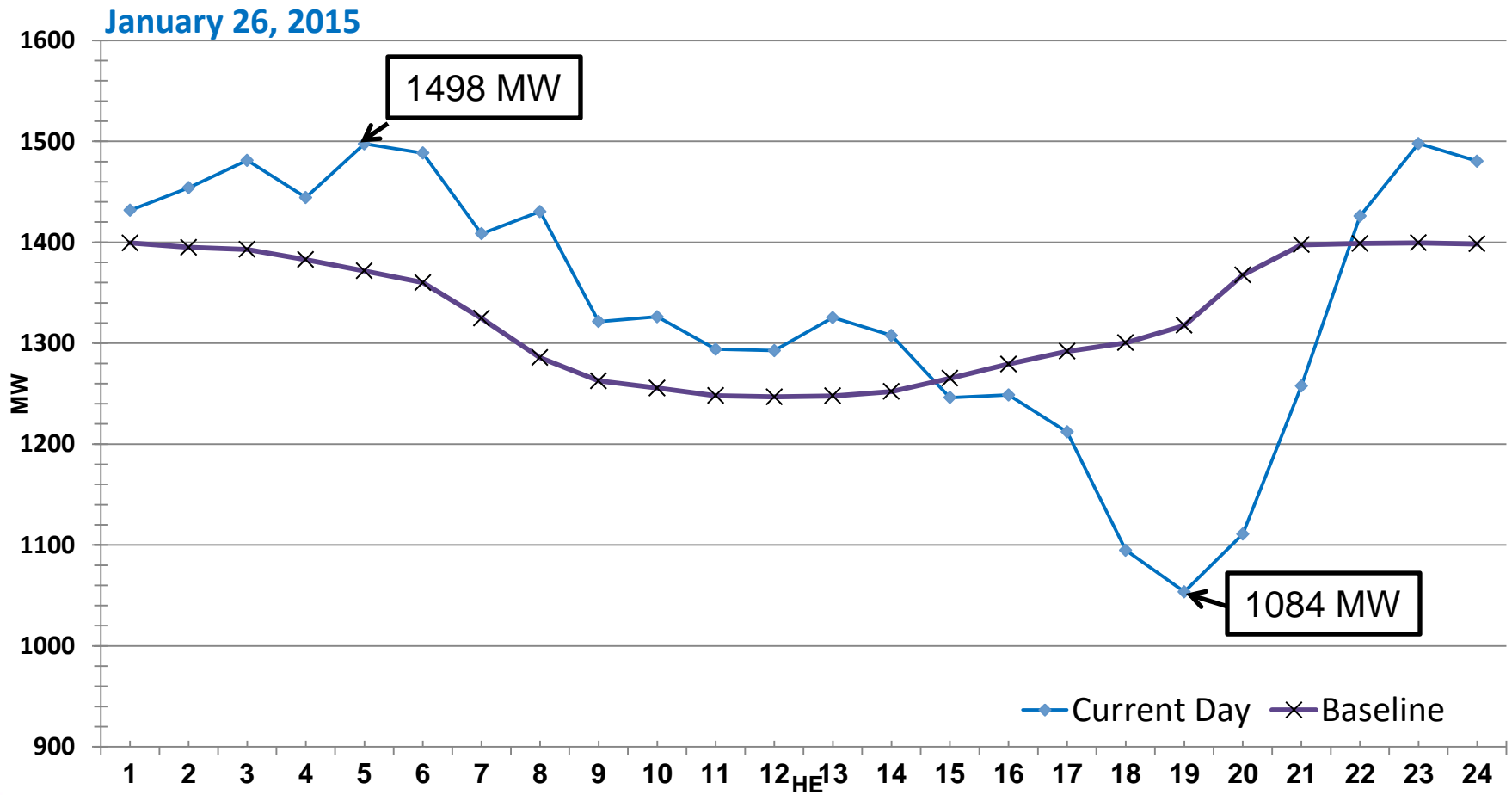
Reliability

- No adequacy issues during the winter and early spring
 - Below normal “freshet” conditions for northern hydro-electric fleet
- Good generator support during cold weather
 - IESO utilized seasonal readiness program
- Large spring nuclear outages resulted in no system issues due to good planning
- Transmission events related to insulator contamination in late February and early March:
 - Western GTA transmission issues from February 28th to March 3rd
 - System wide ‘flicker’ during the evening of March 16, 2015

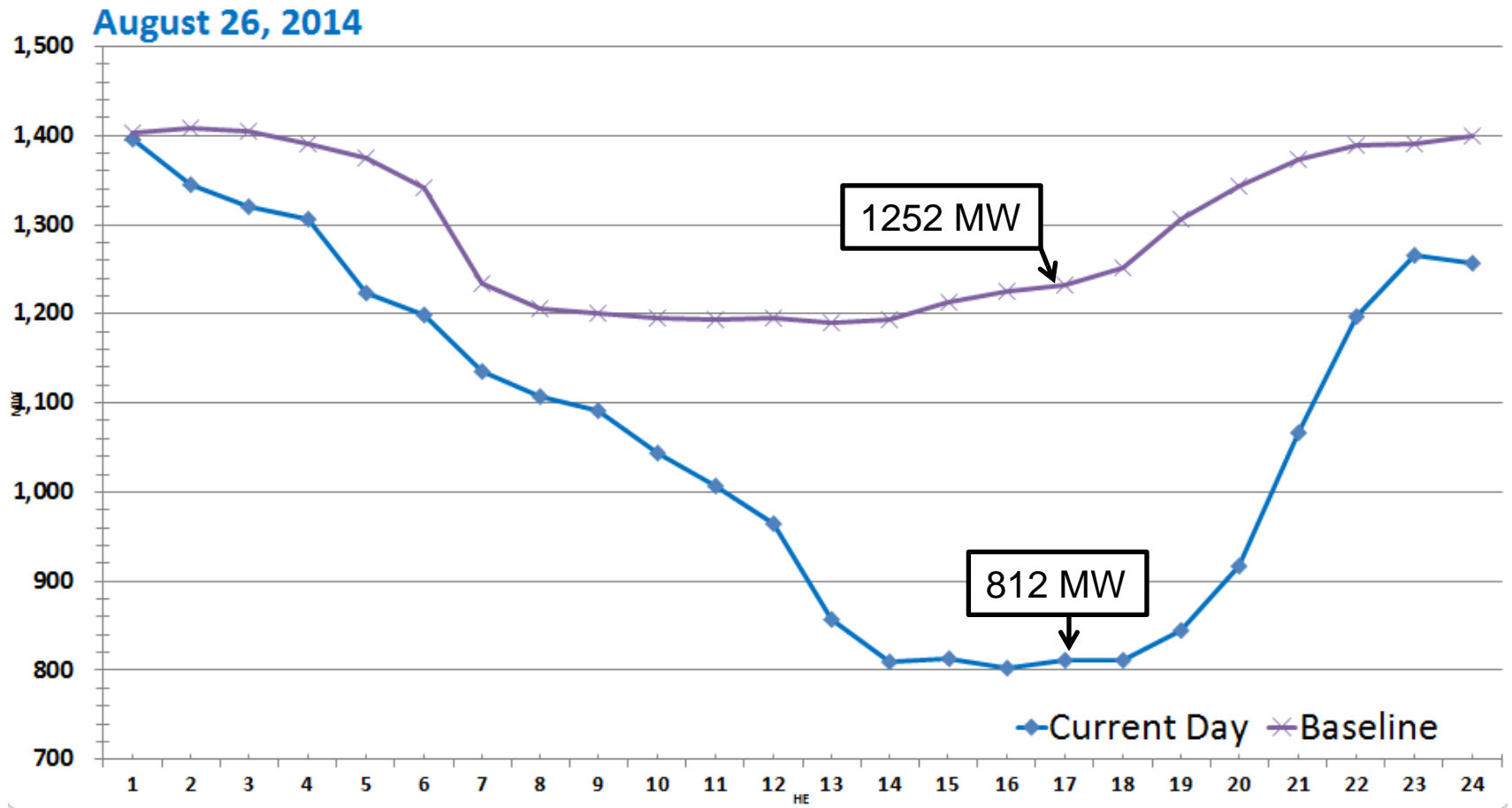
Unique Winter for Ontario Demand

- Ontario was winter peaking in 2014 for the first time in 10 years due largely to milder summer weather and increased embedded solar
- The last base period for Class A customers (from May 1, 2014 to April 30, 2015) included winter peaks in the top five hours of peak demand for the first time since the start of the Industrial Conservation Initiative in 2010
 - Class A customers' contribution to the top five peak hours determines how much they pay in global adjustments costs for a year, starting July 1, 2015
- As a result, there were unprecedented demand reductions from Class A customers during the anticipated winter peaks

Industrial Conservation Initiative: Winter Load Curtailments



Industrial Conservation Initiative: Summer Load Curtailments



Outlook for Summer 2015 and Beyond

Overview

- With adequate supply and reliable transmission service forecasted, the outlook for the reliability of Ontario's electricity system remains positive for the coming summer
- Continuing surplus baseload conditions will be managed through normal market mechanisms including:
 - planned generator outages for maintenance
 - spilling of water
 - increased exports
 - nuclear maneuvering
 - the dispatch and shutdown of grid-connected renewable resources
 - Infrequent nuclear shutdowns
- Demand is expected to gradually decline, demand peaks are expected to gradually flatten and the difference between summer and winter peaks is expected to shrink

Hot Weather Impacts on the Electricity System

- Demand can rise dramatically during a heat wave due to air conditioning load
- Transmission capacity decreases in hot weather, affecting the amount of electricity traveling across the grid
- Transmission infrastructure is also more susceptible to outages due to increased storms, and strain from increased air temperatures
- Water drawn from nearby lakes and rivers for cooling can reduce the efficiency the the cooling processes of nuclear and some natural gas plants
- Extreme air temperatures also reduce the output of natural gas plants



What's Next – Demand

- IESO predicts that energy demand in the province will continue to decline in 2015
- Increased demand for grid-supplied electricity due to economic expansion and population growth will continue to be offset by:
 - Conservation reducing the amount of end-use consumption
 - Increasing embedded generation output offsetting the need for grid-supplied electricity by generating electricity on the distribution system
 - Demand response activities, including the ICI and TOU pricing, reducing system-wide peaks
- IESO will activate demand response resources this summer through the Capacity Based Demand Response program when economical to help reduce system-wide peaks

What's Next – Peaks

- IESO anticipates that the gap between summer and winter peaks will continue to narrow
- Demand response activities are expected to continue to put downward pressure on peaks
- The actions of Class A customers may shift when an anticipated peak occurs

Season	Normal Weather Peak (MW)	Extreme Weather Peak (MW)
Summer 2015	22,991	24,814
Winter 2015-16	22,237	23,029
Summer 2016	22,966	24,541

What's Next – Supply and Transmission

- Supply:
 - About 2,300 MW of new supply is expected to be added over the next 18 months, including 280 MW of solar generation
 - The first storage project of the 34 MW procured last year is also expected to come into service within the next 18 months
- Transmission:
 - Increased system maintenance is expected to be completed in advance of Pan Am games
 - In addition to maintenance and upgrades to existing transmission infrastructure, work will continue on two new transformer stations:
 - Copeland transformer station in downtown Toronto
 - Clarington transformer station in Durham Region

Gas-Electric Coordination

- Coordination of gas and electricity resources is becoming increasingly important for system reliability in the province:
 - Gas represents approx. 30% of Ontario's installed capacity and reliance is expected to grow
 - It assists in managing fluctuations in demand and provides crucial support to meet peak demands
 - Coincident peak demand with gas pipelines and electricity systems could create fuel supply limitations during tight supply days
- IESO launched a stakeholder engagement initiative in May 2015 to gather input on proposed enhancements to the communication and coordination efforts with natural gas generators in Ontario and natural gas pipeline companies
- For more information, see <http://www.ieso.ca/Pages/Participate/Stakeholder-Engagement/Gas-Electric-Coordination-Enhancements.aspx>