



An overview of COVID-19 impacts on electricity system operations

April 23, 2020
Webinar

Today's Webinar Presenters

- **Terry Young**, Vice President of Policy, Engagement and Innovation
- **Leonard Kula**, Vice President of Planning, Acquisition and Operations
- **Chuck Farmer**, Sr. Director of Power System Planning
- **Kausar Ashraf**, Manager, Demand & Conservation Planning
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- **Tam Wagner**, Sr. Manager, Operational Effectiveness
- **Jordan Penic**, Sr. Manager, Engagement and Indigenous Relations

Overview

- Ontario's electricity system is reliable, with enough supply available to meet demand under a variety of risk scenarios
- IESO and stakeholders have been limiting staff on-site, deferring non-essential work, and focusing on core operations
- COVID-19 has disrupted many businesses, resulting in reduced provincial demand and creating significant uncertainty in supply and demand forecasts
 - Demand reductions in all hours ranging from 800 – 3,000 MW, which is 6 -18% of typical demand for this time of year

Overview (Continued)

- Ongoing dialogue is especially important during periods of uncertainty to ensure we can maintain the reliable operation of the grid



PANDEMIC OPERATIONS PREPAREDNESS

System Operations During Pandemic



- The health and safety of staff remains the sector's top priority during the pandemic
- The need to maintain reliability under these circumstances has required the sector to re-evaluate its normal operations
- IESO initiated a number of stakeholder forums to ensure coordination across the sector, even prior to a state of emergency being declared across the province
- Managing workforce attendance risks and demand uncertainty changed the day-to-day operations of energy

System Operations During Pandemic (Continued)



- sector organizations, as well as power system operations
- The IESO is in continuous contact with other reliability coordinators to discuss pandemic planning tactics and strategies

Pandemic Preparations at IESO

- The IESO's internal pandemic plans were executed to safeguard essential staff and maintain reliability, all other IESO staff are working from home
- Control room operator teams are physically separated with day shifts operating at the IESO's primary control centre, and the night shifts operating from the back-up control centre
 - A third control room was built and successfully deployed in 10 days, which can be used to further maintain physical separation of control room operators

Pandemic Preparations at IESO (Continued)

- All individuals that come on site at the IESO's control centres are monitored with temperature and health screenings
- IESO is prepared to have control room operators and other essential staff remain at the primary control centre 24/7 should the need arise

Pandemic Preparations with Stakeholders

- Emergency Preparedness Task Force (EPTF) began regular meetings to discuss preparations for the emerging pandemic on February 19
- The Crisis Management Support Team (CMST) was activated on March 26 as the situation continued to escalate with indications of community spread, and the EPTF was stood down
- The activation of CMST transitioned the focus from crisis planning to crisis response, with a focus on potential risks to grid operations

EPTF: A stakeholder-represented group for emergency planning initiatives, chaired by the IESO

CMST: Forum for key Ontario electricity industry representatives to provide early warnings of events that may affect the reliability of the electricity

Pandemic Preparations with Stakeholders (Continued)

- The CMST continues to meet twice weekly to gather, communicate and analyze information related to the situation and to monitor for potential impacts on the power system, public health and safety, and the environment
- IESO will continue to issue regular communications to stakeholders through the Bulletin, social media channels, and ieso.ca

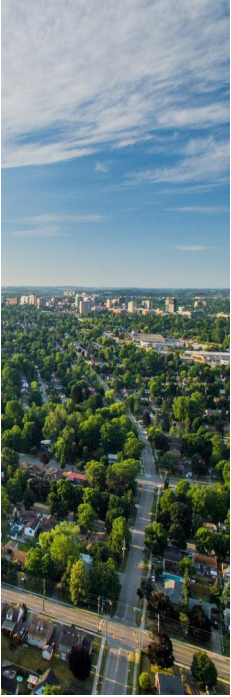
Early Operational Response to Pandemic

- Uncertainty in demand patterns and the need to respond to unanticipated events caused by potential workforce limitations, led to close coordination with market participants to develop revised operational plans to maintain system resilience
- This resulted in:
 - returning of critical power system elements to service that were on outage
 - enabling outages to proceed to reduce the risk of potential forced outages in the near future

Early Operational Response to Pandemic (Continued)

- allowing outages to proceed that did not have significant impact on the power system
- As system conditions normalize, the IESO will be working with market participants to transition back to regular outage planning and operational practices

Increase in Surplus Baseload Generation



- High surplus baseload generation (SBG) conditions are often observed in the spring when demand is low and there are large amounts of energy from hydroelectric resources caused by higher water levels
- As COVID-19 measures were put in place, it was anticipated that demand would decrease and SBG this spring would be exacerbated
- The IESO continues to update its assessment of SBG conditions and SBG management options through spring/early summer

Increase in Surplus Baseload Generation (Continued)



- Neighbouring jurisdictions do not typically experience the same levels of SBG as Ontario – however, this is being closely monitored as demands continue to trend lower



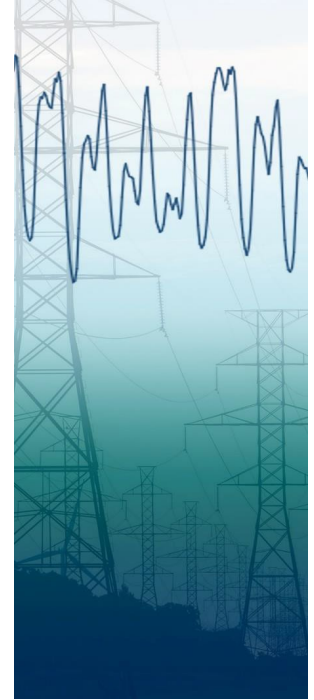
Questions?



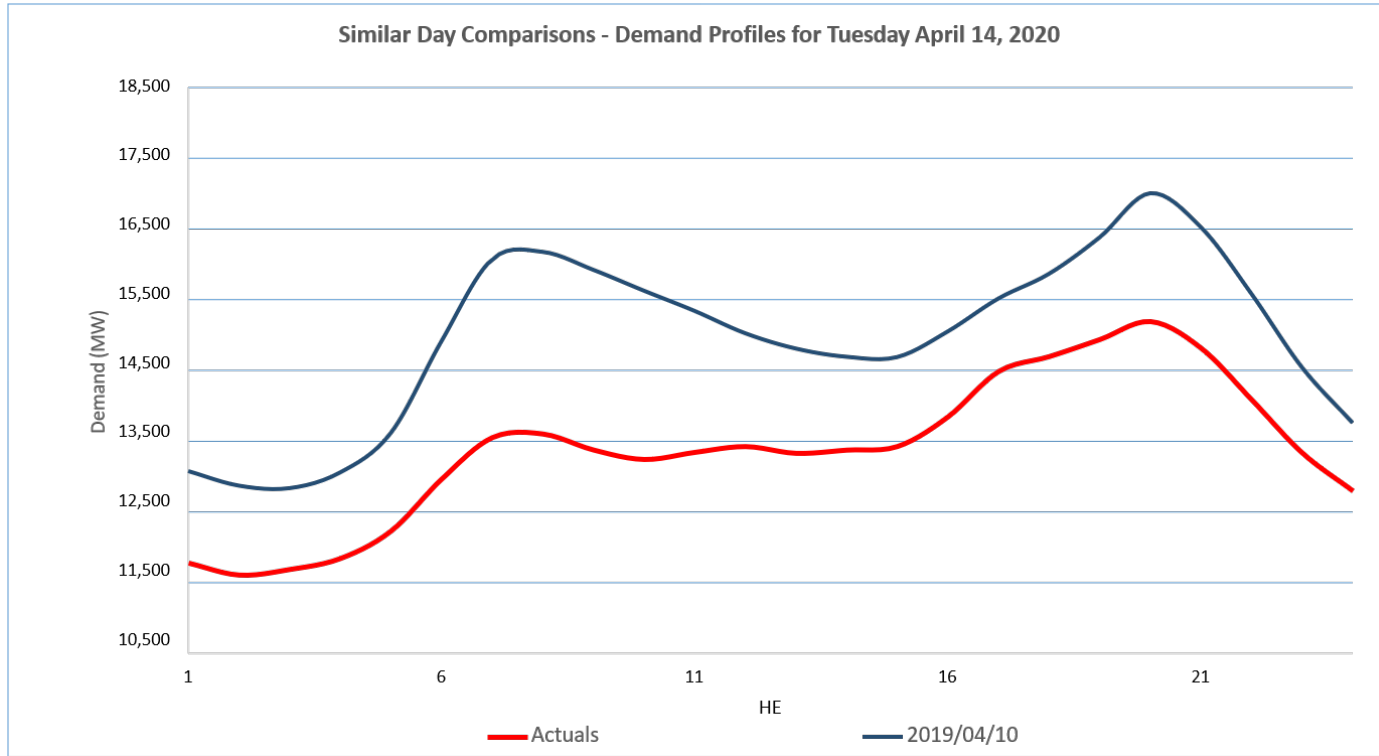
SYSTEM IMPACTS

Overall Impact on Demand for Electricity

- System demand reductions in all hours ranging from 800 – 3,000 MW, which is 6 -18% of typical demand for this time of year
- System peak demand has been reduced by approximately 10-15%
- Overall energy consumption to date continues to be approximately 10-12% lower than normal
- Demand is expected to continue to decrease through April and May when warmer weather materializes



System Snapshot: April 14, 2020



Demand Observations By Consumer Group

Residential demand:

- Peak demand has increased by 2%
- Energy consumption has increased by 4%

Small Commercial (<50kW)

- Peak demand reduced by 17% (weekdays) 14% (weekends)
- Energy has reduced by 12% (weekdays) and 8% (weekends)



Demand Observations By Consumer Group (Continued)

Distribution Connected Industrial/Commercial Customers

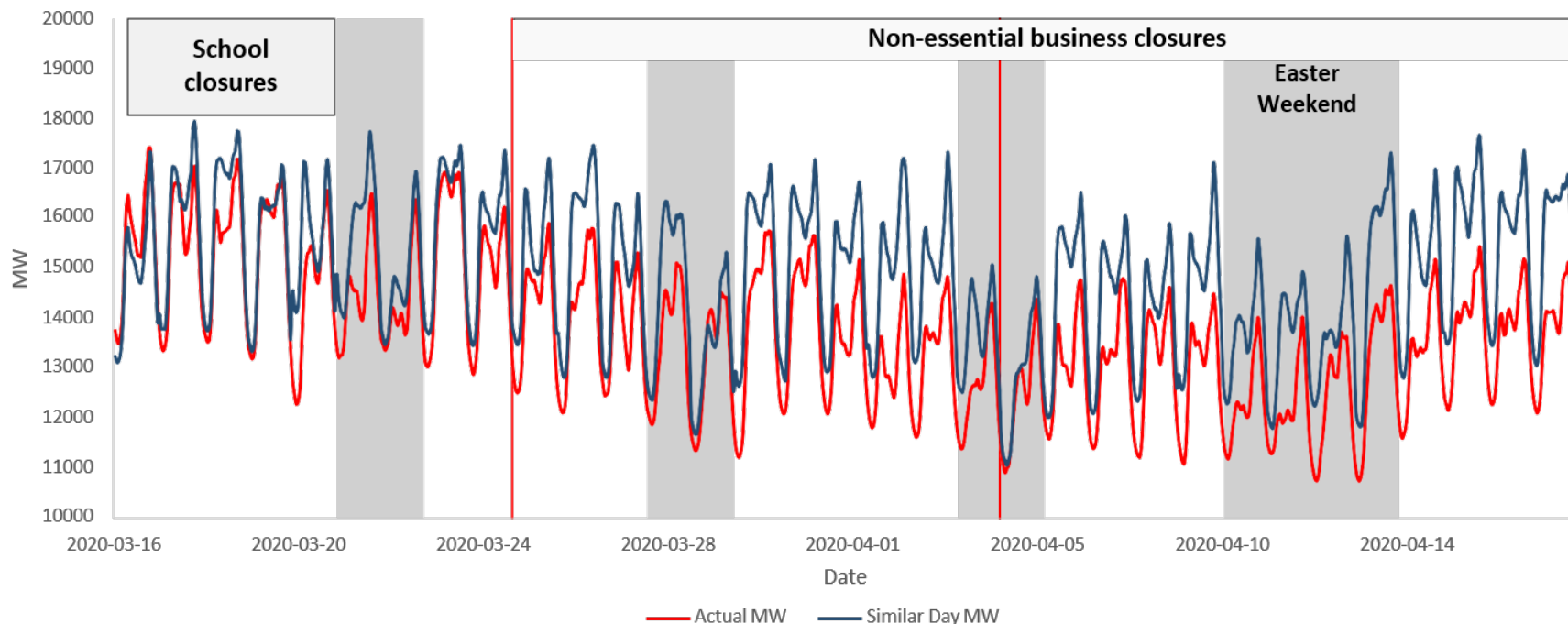
- Peak demand average reductions 17% (inclusive of holidays impacts)
- Energy has reduced by 17% (inclusive of holidays impacts)

Transmission Connected Wholesale Customer Demand

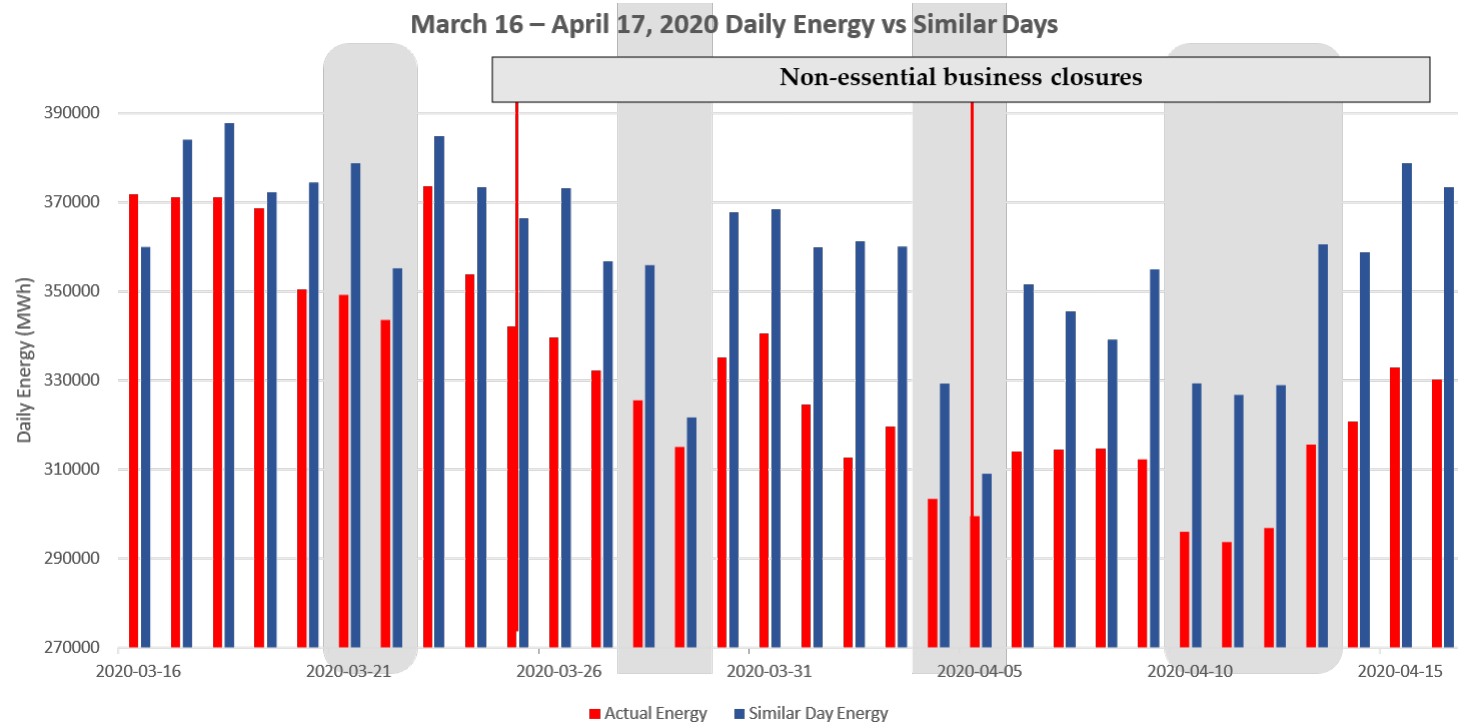
- Peak demand average reduction 16% (inclusive of holidays impacts)
- Energy has decreased on average 16% (inclusive of holidays)

Ontario Demand March 16- April 17, 2020

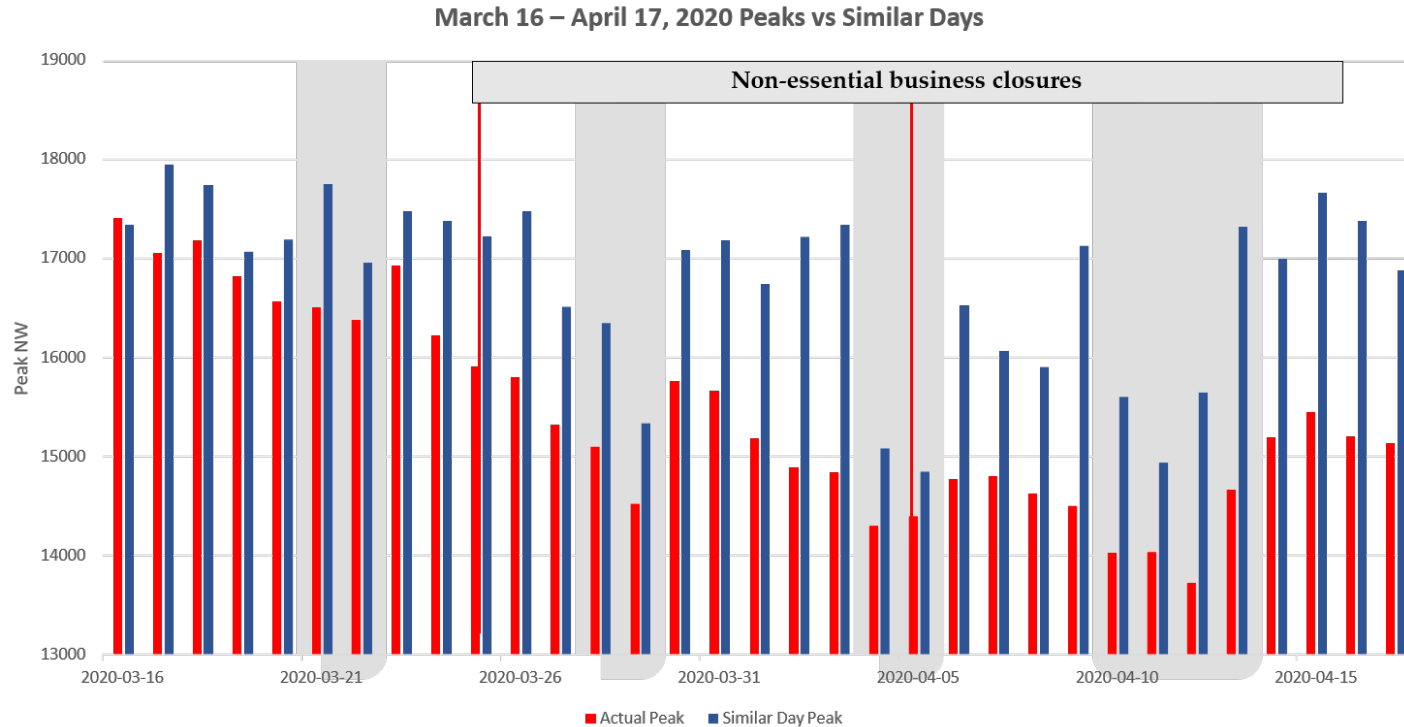
March 16-April 17 2020 Hourly Demand vs. Similar Days



Ontario Daily Energy Use is Down 10-12%



Peak Demand is Down by 10-15 %



Residential Consumer Behavior

- Shifted to working from home, coupled with province-wide school closures, resulting in a 1-3 % increase in load
- Morning peak ramping up slower as residents gradually shift into their new routine
- If a warm spring, there may be additional air conditioning load to consider

Residential Consumer Behavior (Continued)

Detached	Multi Residential	Seasonal
<ul style="list-style-type: none">• Overall – 2-8% increase in daily peaks• Weekdays – 4-8% increase in energy• Weekend – 1-5% increase in energy	<ul style="list-style-type: none">• Overall – 1-5% increase in daily peaks• Weekdays 1-7% increase in energy• Weekend – 1-4% increase in energy	<ul style="list-style-type: none">• Overall – 5-24% increase in daily peaks• Weekdays – 10-24% increase in energy• Weekends – 8-15% increase in energy• Daily min – 7-28% increase

Commercial Consumer Behavior

- Impacted by the mandatory closures of non-essential business, and many shut down or initiated 'care & maintenance' procedures
- Nearly 80% of commercial load will be impacted by measures taken to combat COVID-19
- Specifically the small commercial sector (<50kW) impacts are:
 - Weekday peaks reduced by 15-21%, weekend 8-15%
 - Weekday energy reduced by 10-16%, weekend 3-13%

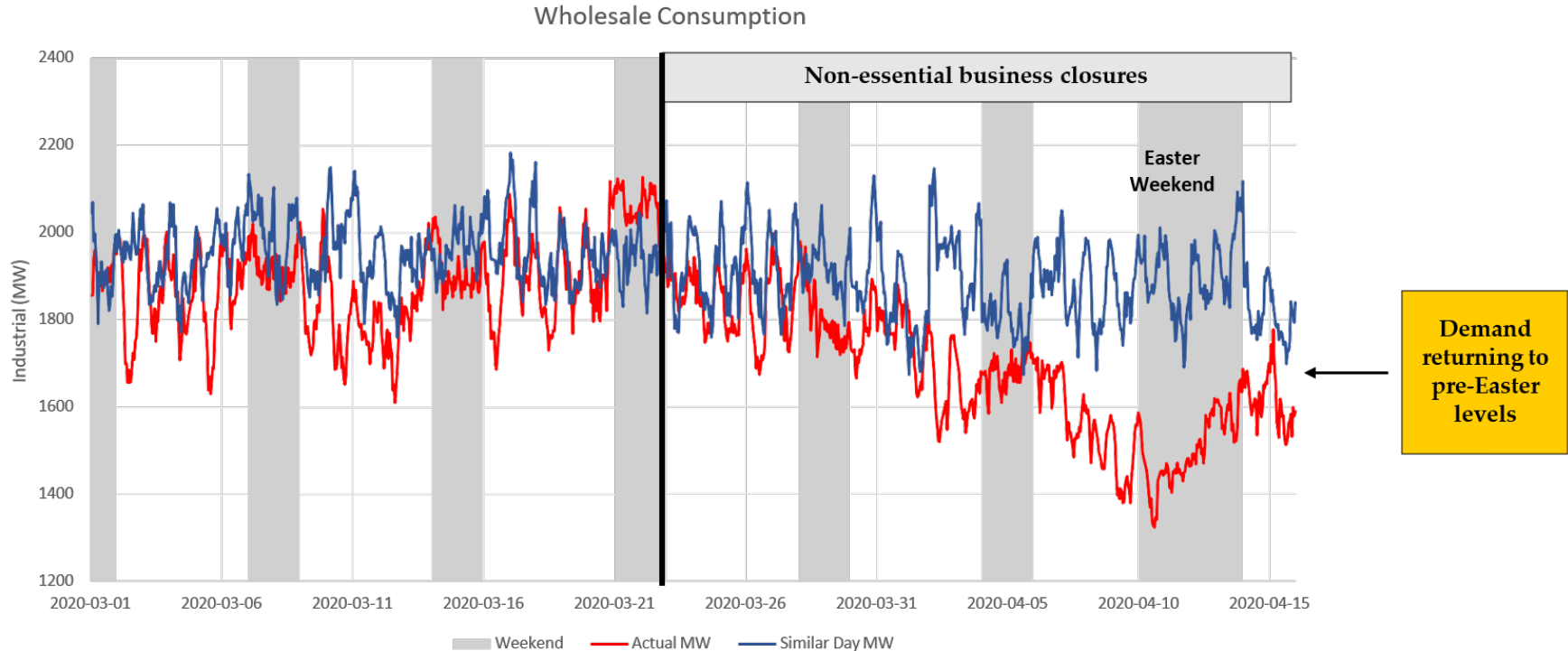
Commercial Consumer Behavior (Continued)

- Distribution connected industrial/commercial (malls, community, retail, office, small industrial) has seen the greatest reductions
 - Overall peak reductions ranging 10-23%
 - Overall energy reduction ranging 14-22%

Wholesale Consumer Behavior

- IESO has visibility into approx. 1,500-2,000 MW of customers that are directly connected to the transmission system
- Current reductions in this consumer segment are on average between 250-300MW
- Government has urged manufacturing to consider producing essential goods to help combat COVID-19, this may result in a marginal bounce-back in load, however this may take time to materialize

Wholesale Consumers Demand Down 13-26%





Questions?



LOOKING FORWARD

Significant Uncertainty to Both Supply and Demand

- COVID-19 impacts have created significant uncertainty in forecasts:
- Demand has declined significantly (both daily peaks and energy)
- Demand forecasts for the next 5 years are very uncertain depending on the length and depth of the downturn and the nature of the recovery
- The nuclear refurbishment schedule has been delayed with further changes expected



Significant Uncertainty to Both Supply and Demand (Continued)

- Other generation facilities may experience difficulty performing regular maintenance, which may in the future lead to higher forced-outage rates
- Transmission development (new projects) is delayed

Demand Uncertainties

- As a result of pandemic response measures, daily peak demands are down by as much as 18%, energy use is down by about 15%
- The outlook for demand over the next 5 years will be driven by the depth and duration of the pandemic response measures
 - A shorter event has a higher probability of a recovery of economic activity in 2021 leading to a return to normal demand trends over the next 18 months

Demand Uncertainties (Continued)

- A longer event or a second wave with a second set of business closures may cause significant economic restructuring and a lengthy recession
- Economic forecasts are mixed, but there is increasing sentiment that a global recession is likely
- Historically, following major recessions there has been a lag in economic recovery versus system impacts

Supply Uncertainties

- COVID-19 has the potential to impact major investments currently underway in supply
- Nuclear refurbishment is the biggest source of new supply over the next 10 years
 - Refurbishment schedules are likely to be impacted and delays are expected
 - Other generators may experience difficulty completing routine maintenance, this may lead to high forced outage rates in the future

Supply Uncertainties (Continued)

- Access to capital, debt and to supply chains could limit the entry of new resources to the system and potentially cause existing resources requiring sustaining capital to shut down

System Costs

- It is too early to assess any impacts on system costs resulting from measures put in place to manage COVID-19
- However, total system costs are unlikely to change materially in the near-term
- Most system costs are fixed – if demand declines, then average unit rates (cents per kWh) may increase
- The IESO will continue to assess any short and long-term system cost impacts once further data is available

Planning Outlook

- The next Annual Planning Outlook will be ready for Q4, 2020 and will incorporate the most up to date information available
 - Market Participants are urged to provide updated outage plans to the IESO to support the assessment process
- In the near-term, IESO will release updated information through the next [Reliability Outlook](#) in June to inform system operations and outage management
- IESO is also exploring other means to keep the sector informed as we manage through the COVID-19 situation

Questions?



ENGAGING WITH STAKEHOLDERS

Understanding Customers and Stakeholders

- Adjusting to customer needs:
 - Seeking to identify early impacts and information needed to adapt system and market operations
 - Listening to understand business continuity outlook across all major sectors – clearly focused on immediate priorities
 - Measuring stakeholder capacity and prioritizing IESO activities accordingly

Understanding Customers and Stakeholders (Continued)

- Adapting stakeholder engagement activities
 - Engagement activities moved to webinar and are being recorded
 - Feedback periods extended to a minimum of three weeks
 - Prioritizing active engagement



Looking Ahead

- Energy Sector [online survey](#) closes April 24
 - Feedback will guide the IESO as it prioritizes activities, conducts outreach and works to better understand how it can continue to support the sector
- Peak Tracker enhancements go live on May 1
 - Two additional data points, earlier, to help Class A participants make business decisions earlier

Looking Ahead (Continued)

- Monthly Stakeholder Engagement Days on May 20-22
 - Monthly, more predictable and efficient
 - Open to all stakeholders
 - Will include next update on sector impact of COVID-19

A Final Question

- What information would you like to see in the next IESO update on the impacts of COVID-19 pandemic?

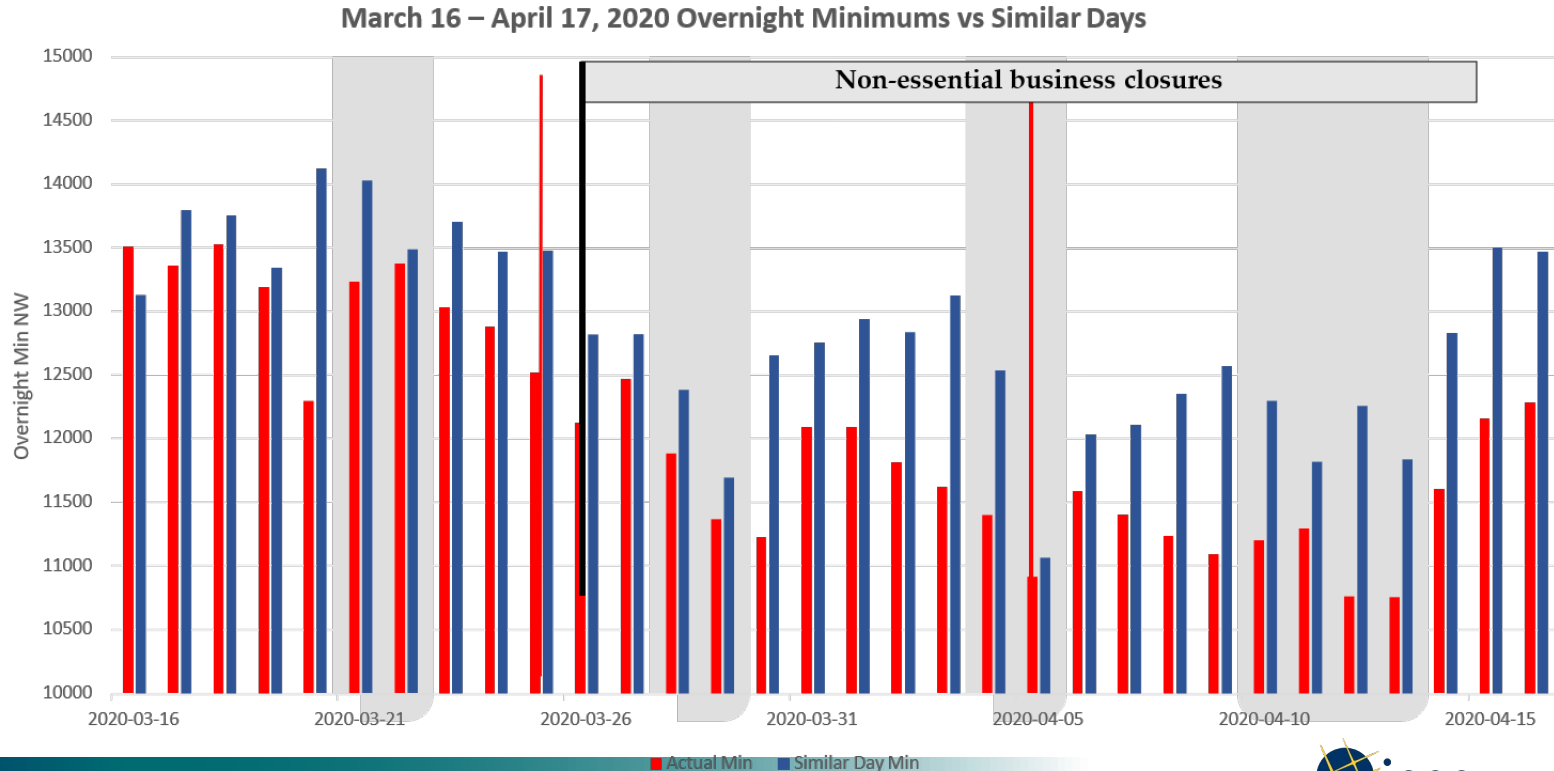
Please submit your response using the 'Ask a Question' feature.

Appendix

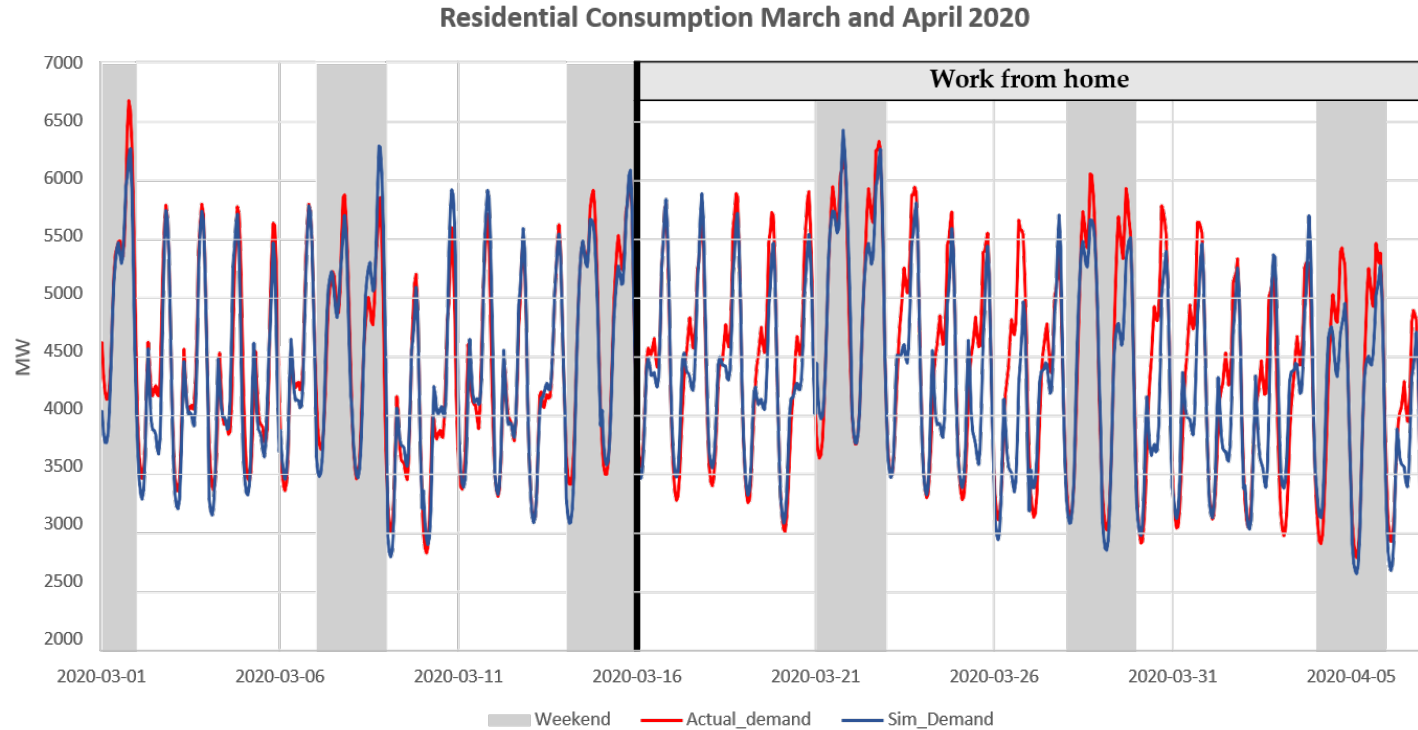
Key Dates in the Pandemic Response

Date	Changes
March 11, 2020	COVID-19 was declared as a pandemic by WHO
March 16, 2020	Start of March Break and first day of mandatory work-from-home
March 17, 2020	Ontario declared a state of emergency
March 22, 2020	End of March Break, but schools remained closed with the possibility of further extensions
March 24, 2020	Mandatory closures of non-essential businesses in Ontario as of 11:59pm.
April 4, 2020	Additional non-essential businesses were asked to close as of 11:59pm.

Overnight Lows are Reduced by 9-13%

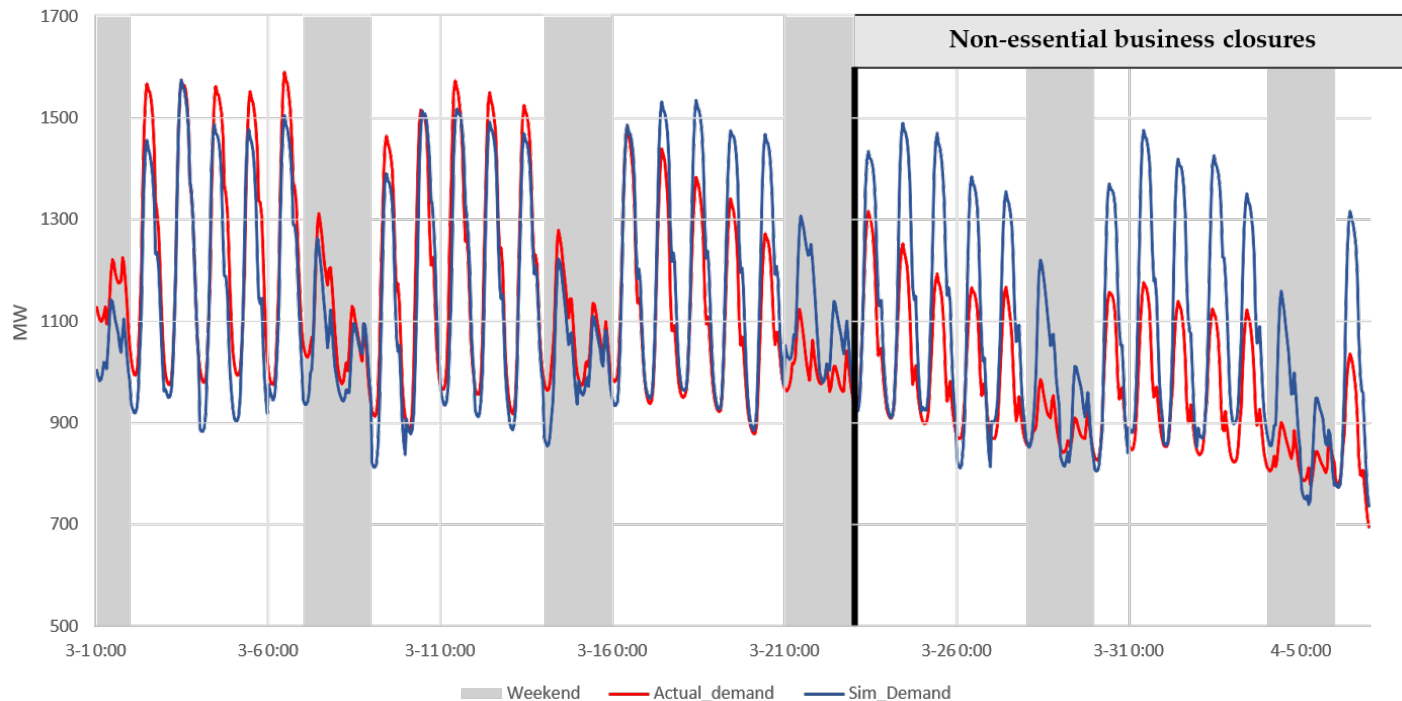


Residential Consumption Shows Slight Increase



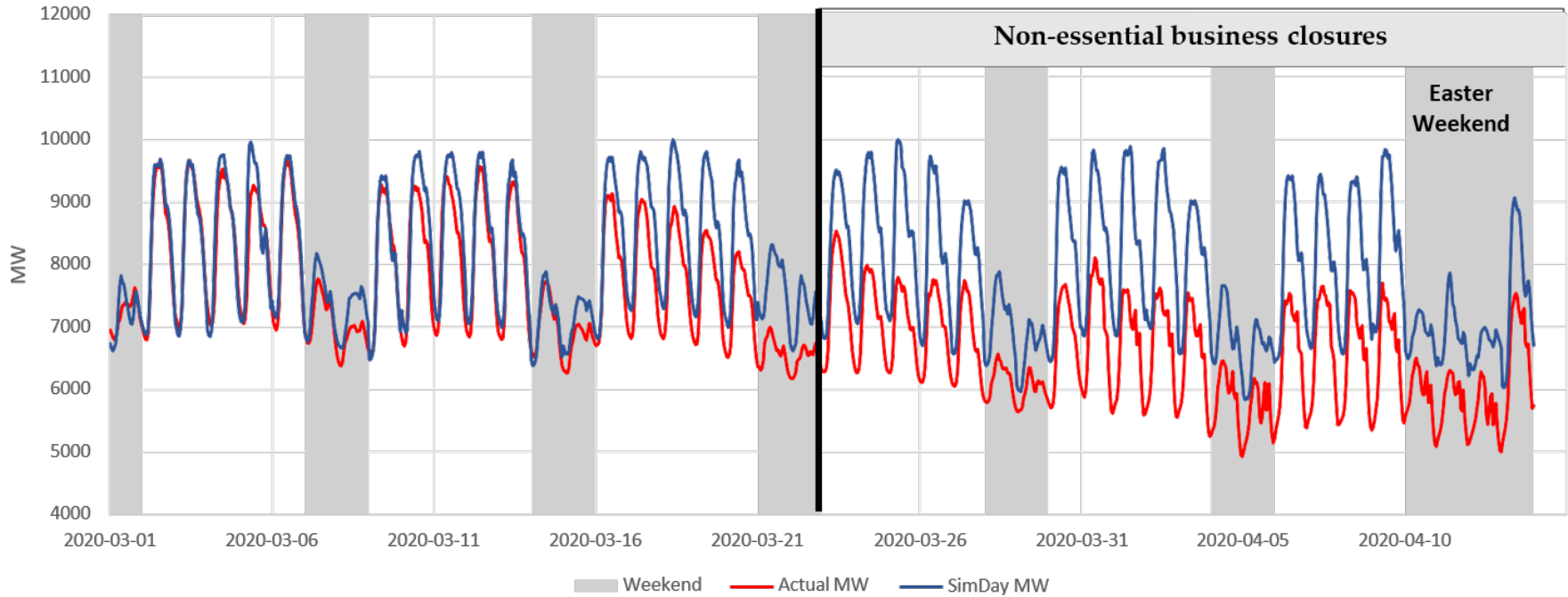
Small Commercial Peaks Down 14-17%

Small Commercial - March and April 2020



Distribution Connected Industrial/Commercial Peaks Down 10-23%

Dx Industrial and Commercial Consumption



Thank You

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