

Report on Operations

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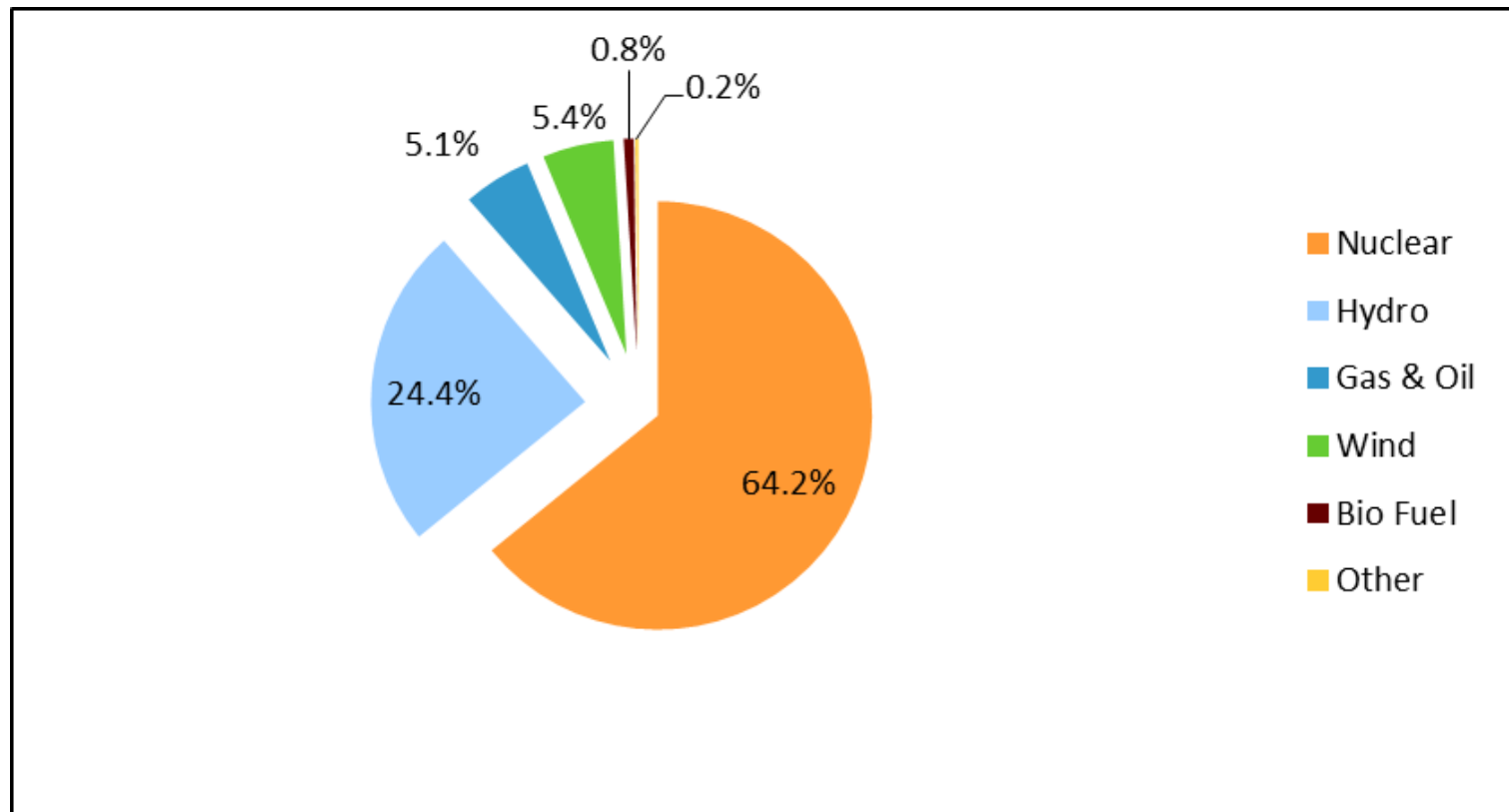
May 11, 2016

Power System Operability

- System Operators across North America are facing new challenges as their supply mix evolves
- For over a decade, the IESO has spoken to operability, and our efforts to ensure that the power system can be operated reliably and efficiently
- This presentation will speak to the operating challenges that the IESO is presently facing and expects to continue to manage in the next few years

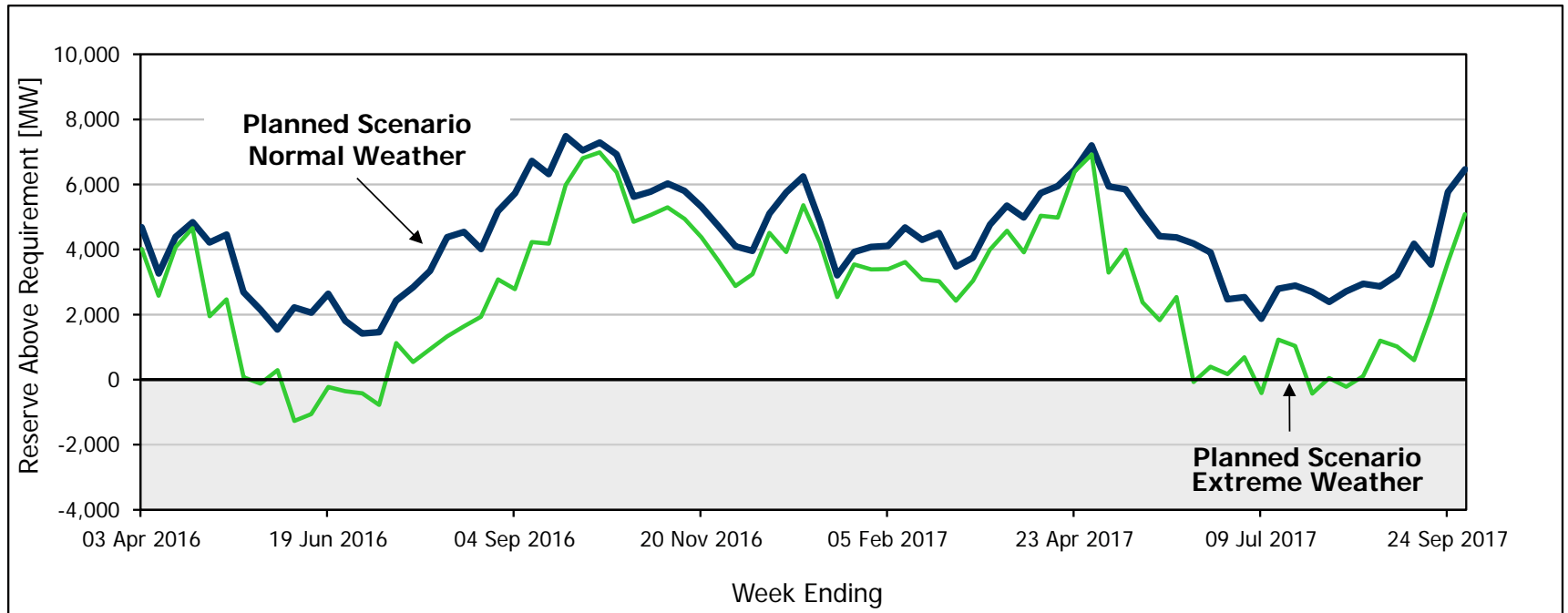
Production by Fuel Type

April 1, 2016 to September 30, 2017



Reserve Above Requirement

Planned Scenario: Normal and Extreme Weather



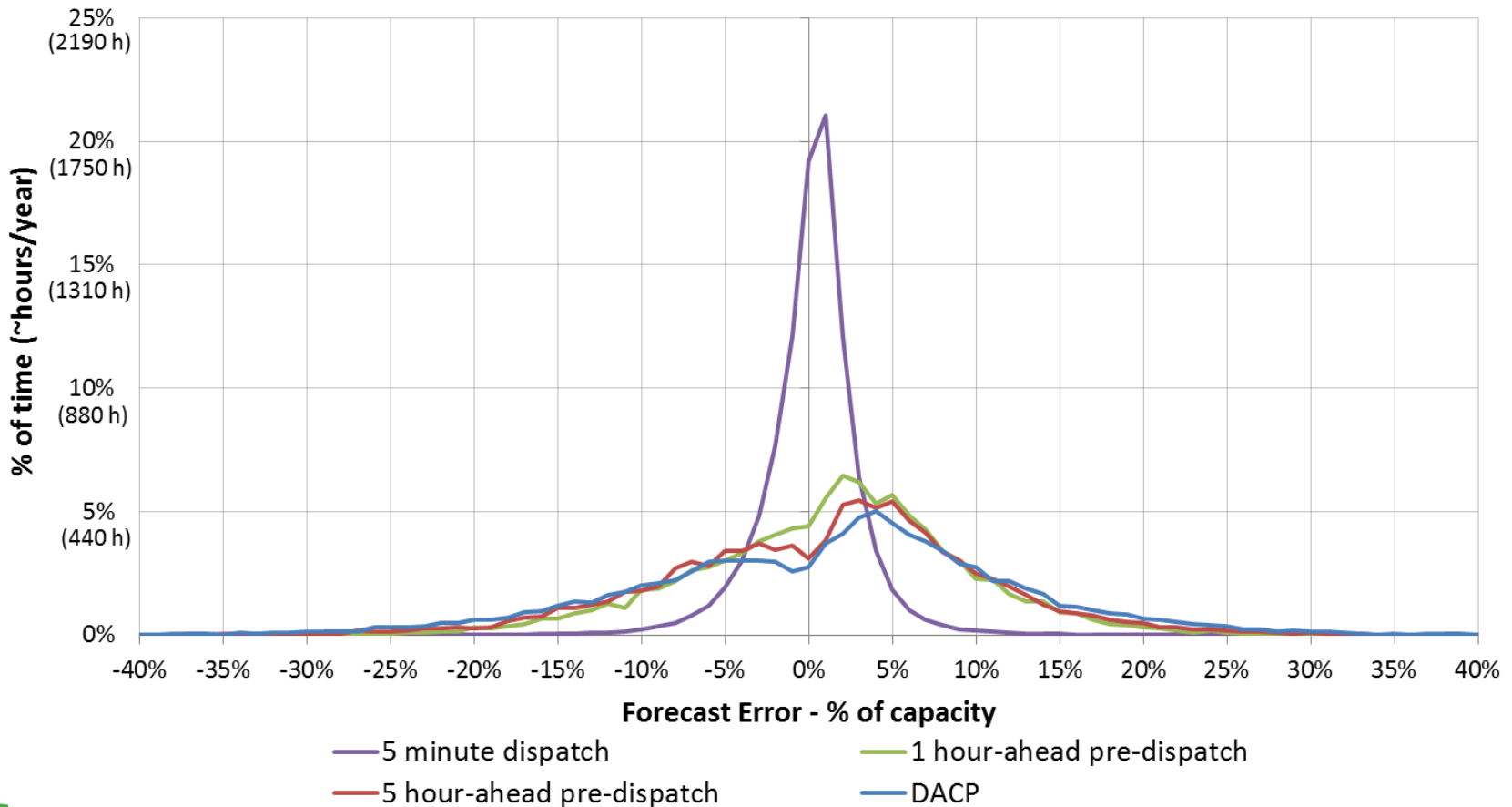
Reserve Above Requirement = Available Resources – (Demand + Required Reserve)

IESO Operability Assessment

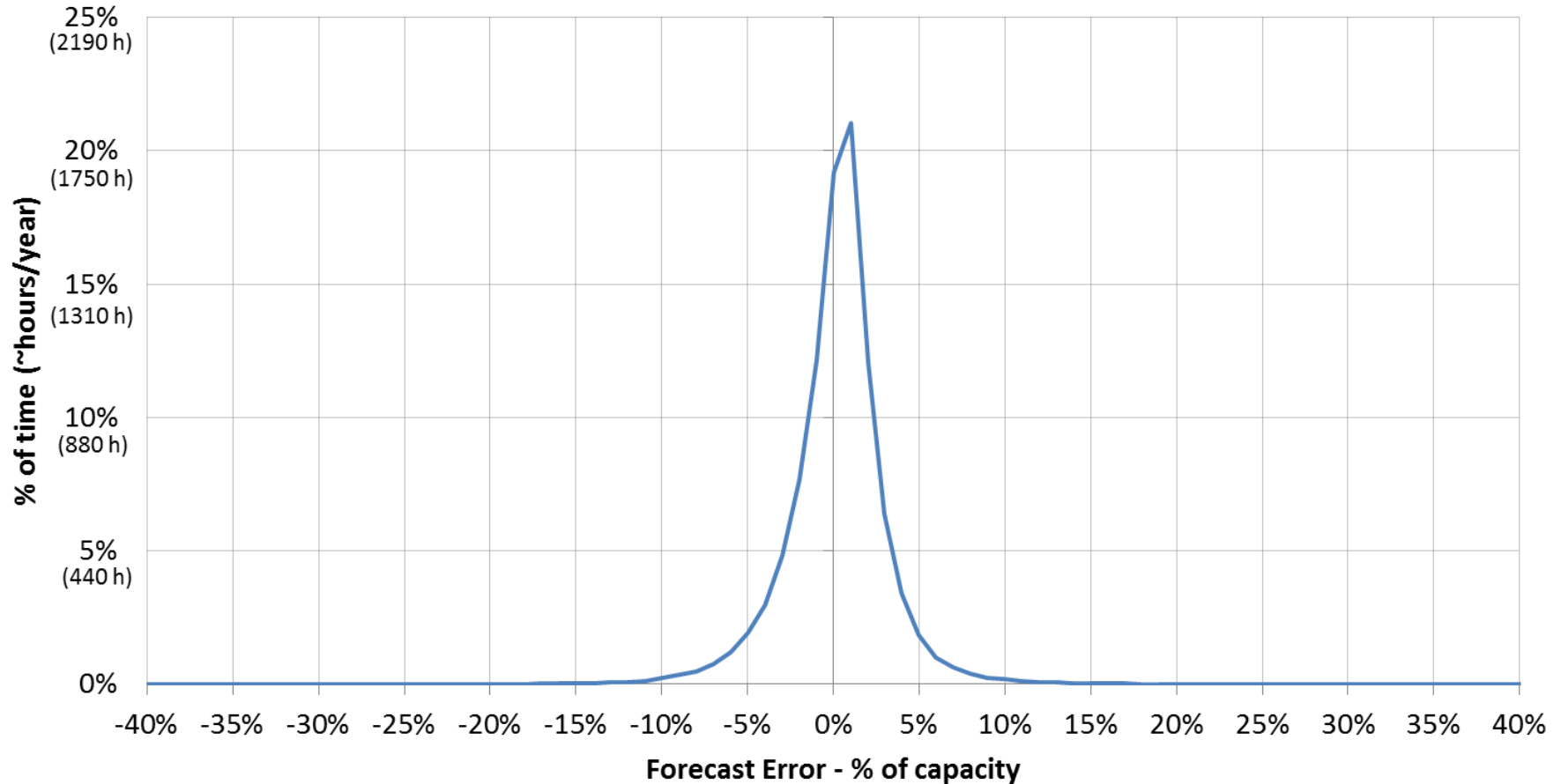
- The IESO recently completed an operability assessment for the period 2016 to 2020
- Areas of focus:
 1. Scheduling of resources to balance supply and demand
 2. Frequency regulation
 3. Grid voltage control
- The high penetration of wind and solar generation in Ontario is one of the reasons that we are presently facing a few operating challenges which the IESO expects to continue to manage in the next few years

1) Scheduling of resources – need additional response capability to manage potential over-forecast of wind/solar output

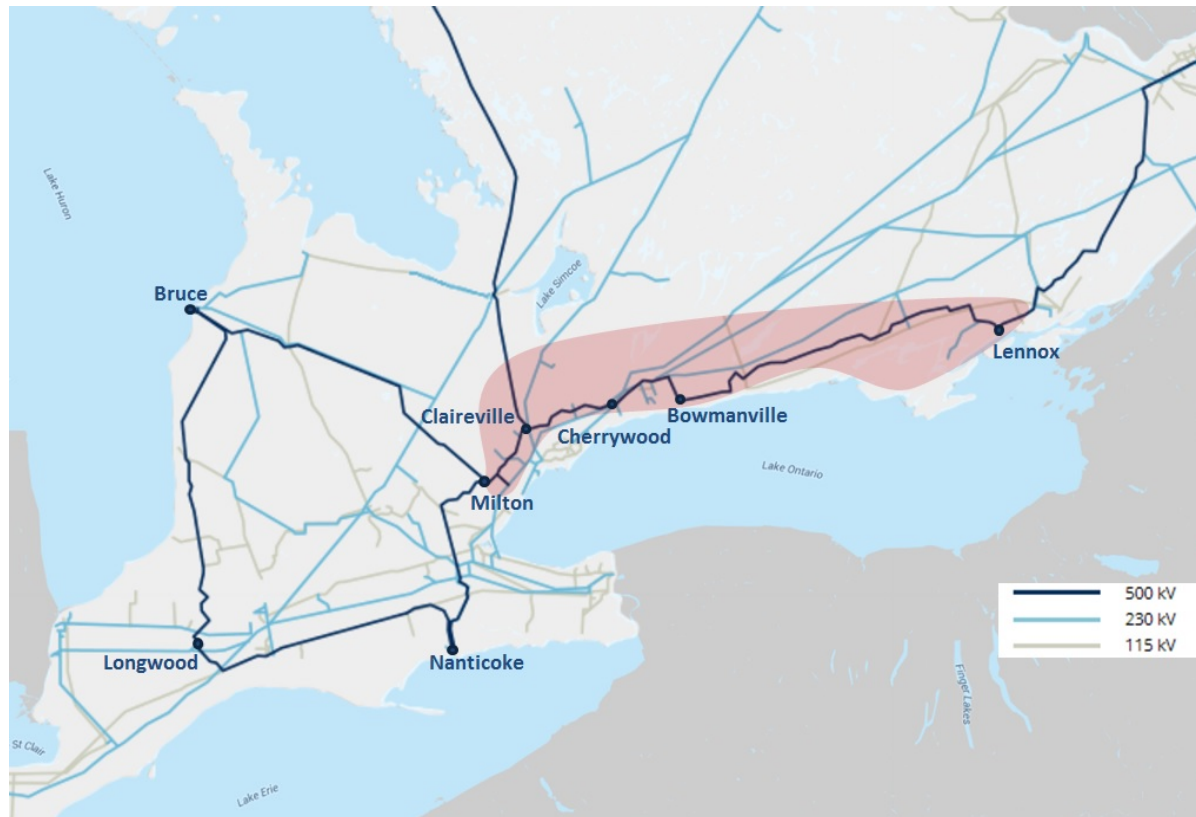
Variable Generation Forecast Error Distributions



2) Frequency Regulation – need additional regulation capability to manage the 5-minute wind/solar forecast error



3) Grid Voltage Control – need more dynamic and static reactive control devices to better manage voltages



Other topics that were investigated, with no concerns identified

- Variability of wind/solar generation and its impact on:
 - Operating reserve requirements
 - Ramping requirements
- Surplus baseload generation (SBG)

Next Steps

- In 2016, the IESO will issue an RFI and RFP for regulation services
- IESO will launch a stakeholder initiative to determine the best approach for acquiring additional response capability in Ontario
- The IESO is working with transmitters to improve the IESO's ability to manage transmission system voltages