

# Variable Generation Dispatch Study

Dispatch Technical Working Group  
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- Variable generators registered as market participants will be subject to a security constrained economic dispatch. As previously discussed, the IESO dispatch algorithm produces and publishes the dispatch solution every 5 minutes.
- Concerns have been raised at previous Dispatch Technical Working Group (DTWG) meetings regarding the number of dispatch instructions a variable generator would receive after becoming dispatchable.

- In order to address these concerns, the IESO gathered and analyzed data in a dispatch simulation.
- A historical analysis was performed utilizing nodal pricing data for each 5-minute interval from July 1, 2011 to December 31, 2011. This simulation timeframe comprised of 52,938 5-minute intervals.

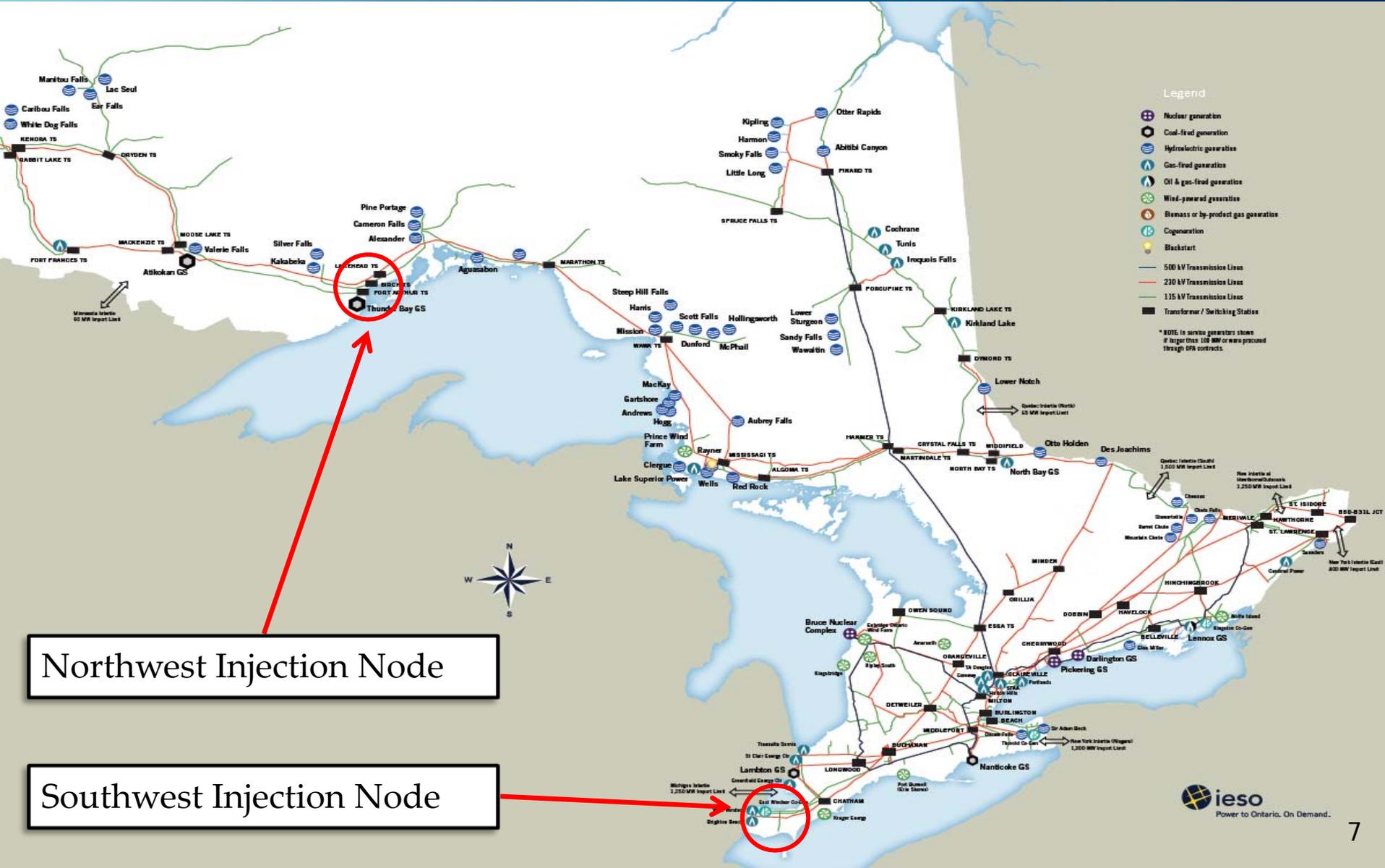
**Note:** There were 54 intervals that were not included in the study timeframe due to planned and unplanned market tool outages.

- The results of the study are only an approximation and do not take into account the reason for the simulated dispatch.
- Future dispatch results will differ materially from the historical results.
- The analysis performed did not calculate the magnitude (MW amount) of dispatches that would have been issued in each instance.

- The historical results do not represent the effects of the normal Resource Dispatch filtering process that takes place prior to dispatches being published.
- The filter threshold is any change from the previous dispatch instruction that is the lesser of 2% of the unit capability or 10 MW.

- In order to illustrate the effect of dispatch on geographic location, two injection nodes were chosen. Representative reference nodes were chosen to reflect nodal prices in northwestern Ontario as well as southwestern Ontario.

**Note:** The IESO market models hundreds of injections and withdrawal nodes. Data was analyzed using only two nodes for illustrative purposes. This analysis does not represent the effects of price on any other geographical or electrical location.

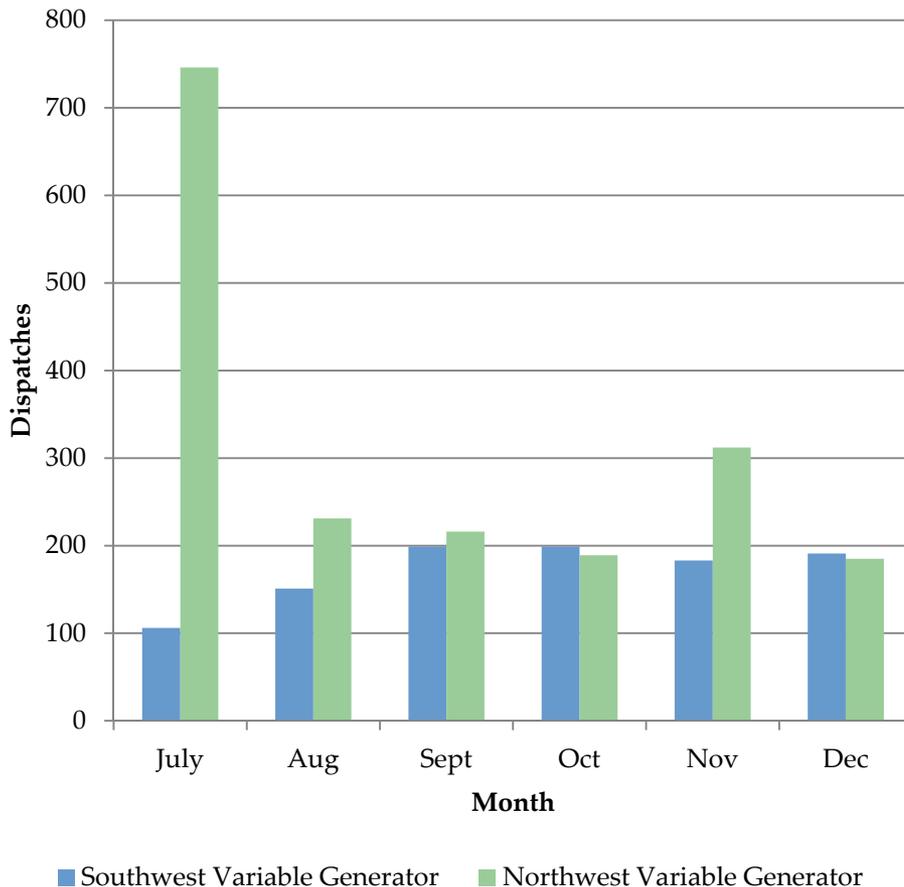


- The nodal prices for each interval were compared to a simulated variable generator offer price of -\$1.00 at the respective nodal bus.
- The simulation results demonstrate the number of mandatory dispatch instructions sent to the variable generator. For the purpose of the simulation, if the historical price at the node was below the -\$1.00 offer price, the hypothetical generator at this connection point would have been dispatched down.

Factors that can influence nodal prices include:

- Primary demand;
- Amount of existing and new generation in the area;
- Interchange transactions;
- Security constraints;
- Economic constraints; and/or
- Line losses.

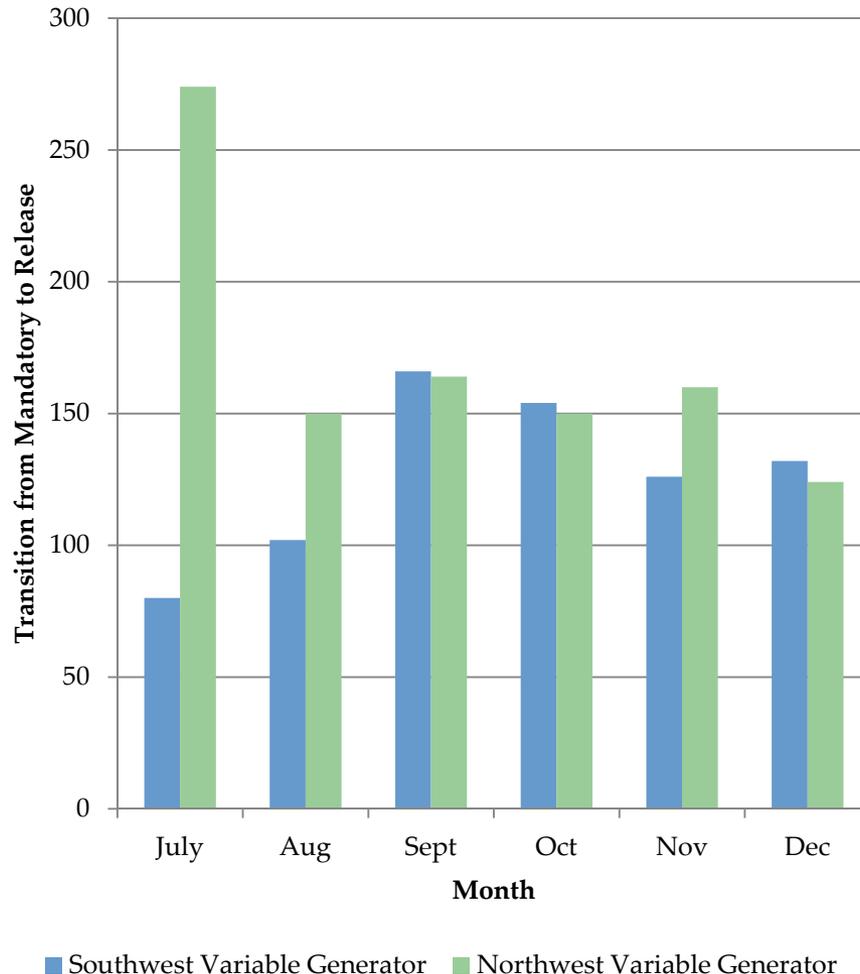
**Note:** The sensitivity of these factors on the study was not determined. The effect of these factors in the future is unknown, therefore, these results should not be viewed as a forecast.



- 52,938 5-minute intervals during the study period from July to Dec 2011
- A generator at the northwest injection node would have received a dispatch for 3.5% of the total intervals (1,879 intervals)
- A generator connected at the southwest injection node would have received a dispatch for 1.9% of the total intervals (1,029 intervals)

- The longest consecutive mandatory dispatch in the historical analysis occurred in July 2011 on the northwest node with 90 consecutive mandatory dispatches.
- The average length of a mandatory dispatch lasted 3 intervals in the northwest and 4 intervals in the southwest.

# Transitions in Dispatch



- This graph represents the transitions of dispatch obligation, i.e., Informational-Mandatory and Mandatory-Informational (Release)
- Each transition would have required VG operator acknowledgement to accept or reject the dispatch

- Study results show that in northwestern Ontario 3.5% of the total dispatches would have been Mandatory and 1.9 % in southwestern Ontario.
- Study results do not differentiate between security, economic, or locational constraints.
- This is not a forward looking analysis, it is a historical study of 2 injection nodes in Ontario.

# Questions?

An aerial photograph of a wind farm. In the foreground, a large, white, curved blade of a wind turbine dominates the lower-left and center of the frame. In the background, several other wind turbines are visible, standing on a green, forested landscape under a bright blue sky with scattered white clouds.