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Microgrids Can Play An Important Role In Reducing ERCOT's Fossil Fuel Dependency

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February 10, 2016

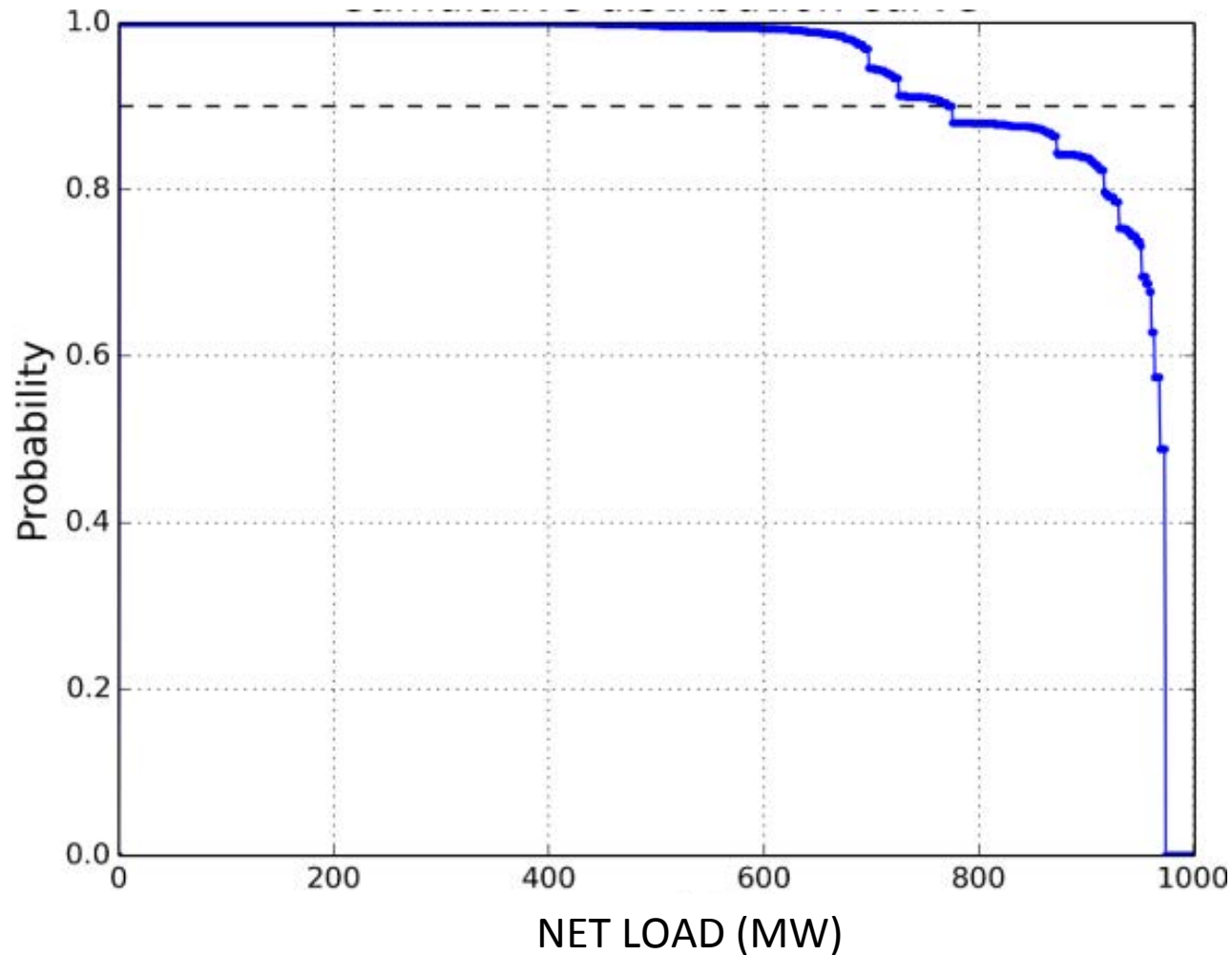
- **The Loss of Load Expectation LOLE Hourly Model**
- **Visualizations of Renewable Power vs Demand**
- **Benefits of Microgrids to Owners and to ERCOT**

The Loss of Load Expectation LOLE Hourly Model

LOLE is a measure of the risk for loss of load due to insufficient generation capacity.

- Two Equivalent Calculations of LOLE (0.1 days/year desired)
 - 1) Direct Solution -> $LOLE = \sum_{365} \text{maxdailyLOLP}$ = the annual sum of each day's maximum Loss of Load Probability.
 - 2) Monte Carlo -> $LOLE = \sum \text{loss of load days} / \text{number of years simulated}$ (example: 500 days out of 5000 years).
- Both methods utilize historical data from years 2010 – 2012
 - Hourly ERCOT Demand; peak is scaled to a future year.
 - Hourly Wind; scaled to future MWs in each of 3 areas, Panhandle wind, West Texas wind, and Coastal wind.
 - Hourly Solar; scaled to future MWs in each of 3 areas Austin area, San Antonio area, and Pecos County area.

- Direct Solution is fast and accurate; uses $F(x)$ <http://egpreston.com/OPDC.txt>
 - Hourly LOLP = $1 - F(\text{net load } x)$ is a 'look-up' where
net load $x = \text{hourly load MW} - \text{hourly renewable MW}$.



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[Islanding the Grid - Getting to 100%](#)

First appeared as part of the conference materials for the
2016 Renewable Energy Law session

"Islanding the Grid - Getting to 100%"