Renewable Integration in ERCOT

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Changing Resource Capacity Mix

In 2016, Renewables increased to 21%
• Texas is #1 in the U.S. in wind capacity.
• If the ERCOT Region was a separate country, we’d be #6 in the world in wind generation capacity (as of end of 2015).

Peak Average Capacity Contribution (Summer):
• Non-Coastal Wind: 14% of installed capacity
• Coastal Wind: 58% of installed capacity
ERCOT’s Long-Term System Assessment (12/16) projects 14,000 to 28,000 MW of solar by 2031

Peak Average Capacity Contribution (Summer): 77% of installed capacity
CREZ Transmission

Competitive Renewable Energy Zones (CREZ)
Docket No. 35665
Attachment A

Source: Oncor

NEW MEXICO
MEXICO
ARKANSAS
LOUISIANA
OKLAHOMA
Integrating and Managing Renewables

- ERCOT’s 7-day wind forecast overall performance has steadily improved
  - Inclement weather preparation, including capability to manually overwrite wind forecast for icing events

**Day Ahead Wind Forecast Performance**

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<th>Year</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
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MAPE = MEAN ABSOLUTE %ERROR
Integrating and Managing Renewables

- Grid-scale solar PV forecasting tool moved into production April 2016
- Performance has steadily improved
Control Performance Standard 1 is a measurement of how well a Balancing Authority (ERCOT) maintains grid frequency within acceptable parameters. It is a metric of the North American Electric Reliability Corporation (NERC).

CPS1 12 Month Rolling Average = 176.31%

('Perfect' score is 200%)
Regulation Service Requirements 2011-2016

- Annual procurements of Regulation Service (MW/h) and year-end Installed Wind Capacity (MW)
  - Reg. requirements have decreased even as wind integration has increased
Questions?