



## **Item 4.5.2: Grid Impacts of Natural Gas Price**

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Board of Directors Meeting

ERCOT Public

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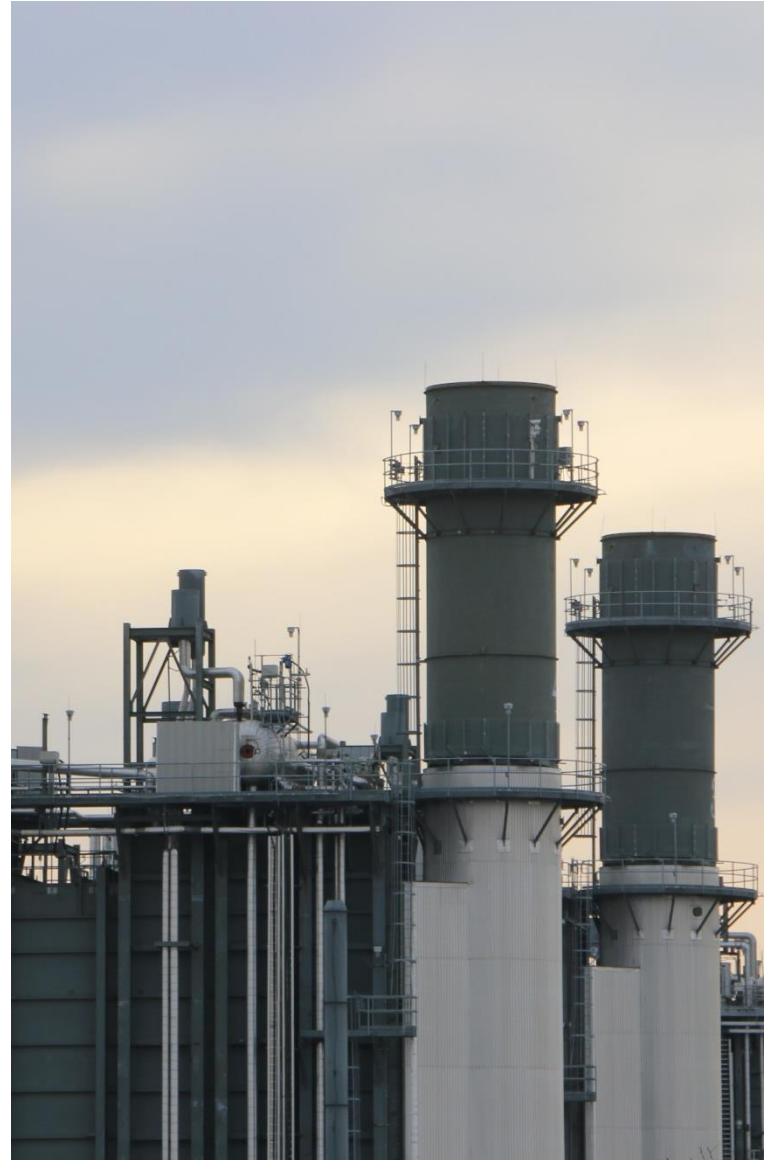
## Background

The ERCOT Grid is experiencing significant change

Primary causes are:

- Open, competitive market
- Integration of new technologies
- Sustained low natural gas prices

This discussion will focus on changes due to natural gas prices and markets

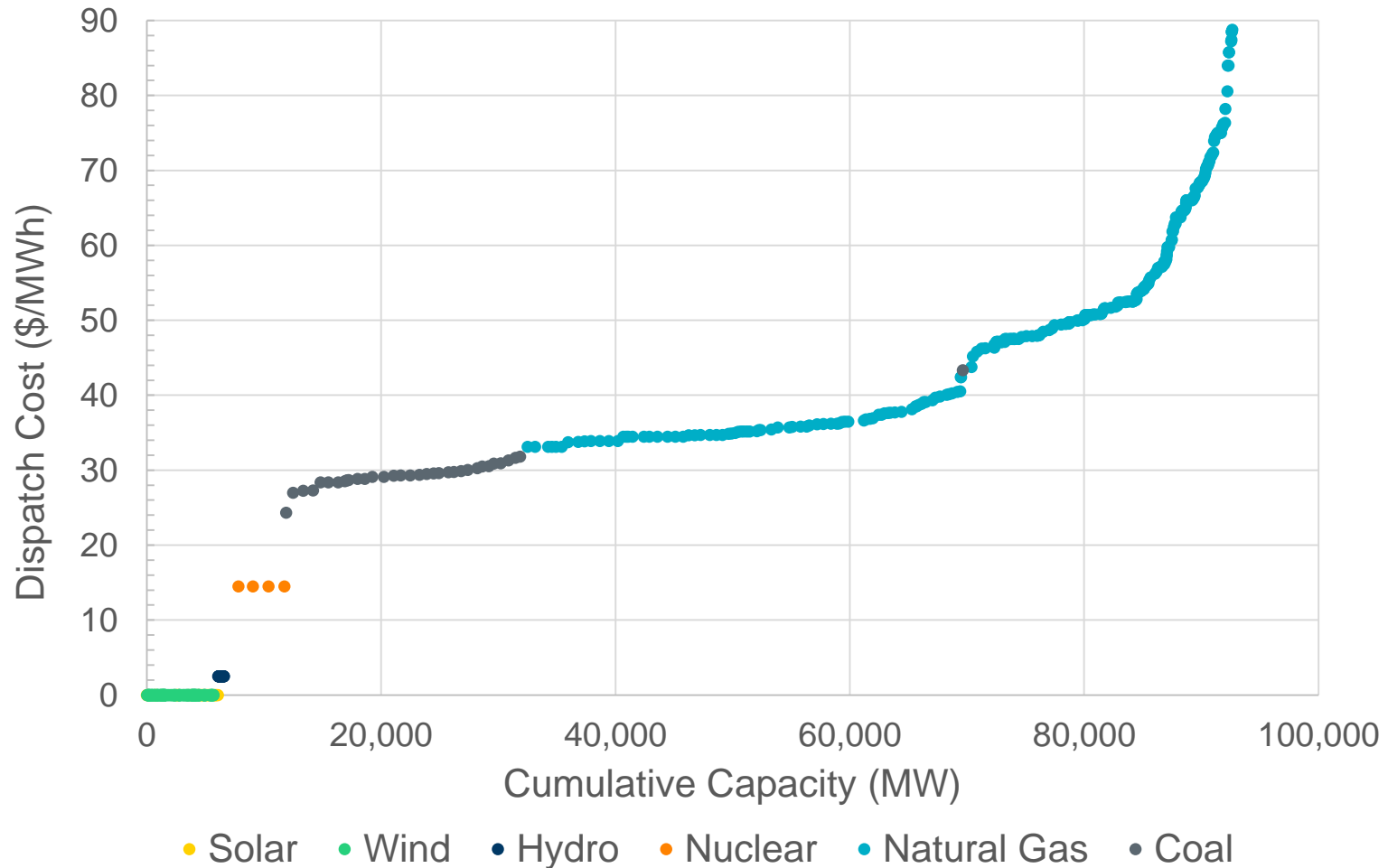


## Natural Gas Price Impacts in ERCOT

- Natural Gas accounted for 35% of electricity generation for the first half of 2017 (58,441 GWh) and 44% for all of 2016.
- Natural gas markets are causing localized growth in customer demand for electricity
  - Natural Gas extraction in the Permian Basin
  - Industrial demand near Houston
  - LNG Facilities

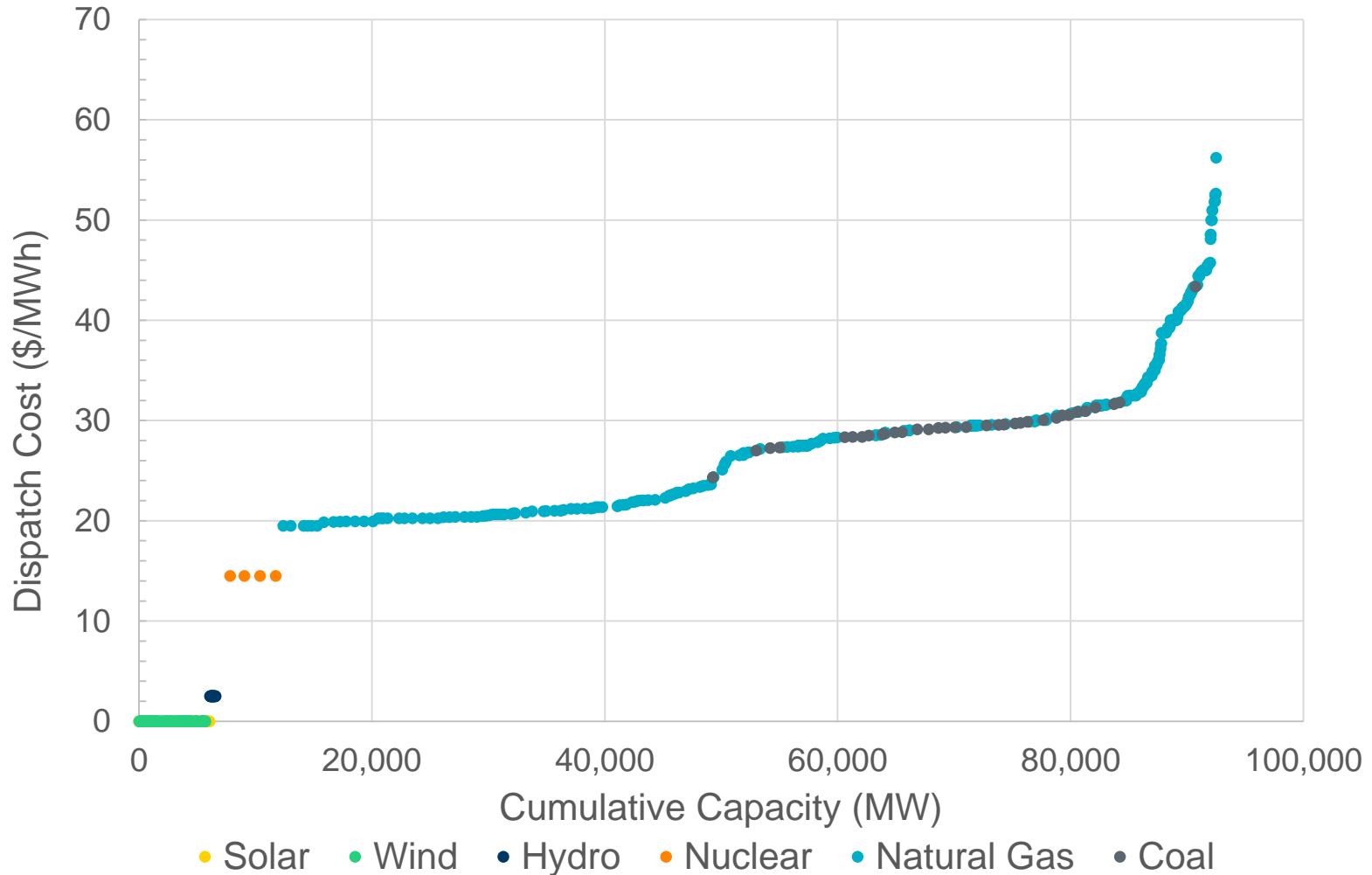
# Changes in the Resource Price Stack

ERCOT Bid Stack with Natural Gas Price = \$4.50/MMBTu



# Changes in the Resource Price Stack

ERCOT Bid Stack with Natural Gas Price = \$2.50/MMBTu



# Grid Operations and Planning Adjustments

- ERCOT worked with Black and Veatch to conduct several assessments of natural gas infrastructure impacts in 2012.
  - These studies indicated that existing pipeline capacity in the ERCOT region was sufficient to meet natural gas demand even with expected growth of natural gas generation capacity.
- ERCOT is starting a new study to look at this issue in light of changes to both natural gas system and the electric grid.
- Recent ERCOT planning studies have not identified any single points of disruption on the natural gas system that would have a significant impact on ERCOT generation capacity.
- NERC is scheduled to issue a Special Reliability Assessment on gas infrastructure disruptions this month
  - ERCOT will continue to work with NERC on this issue.

## Grid Operations and Planning Adjustments

- Enhanced communication with gas pipelines operators provides improved situational awareness of gas pipeline restrictions.
- Black Start Coordination:
  - Major intra-state gas pipelines provide the Black Start Gas Coordination Group (BSGCG) with a list of priority loads that would need off-site power during a black start event to maintain gas flows to Black Start and Next Start Resources.
  - Transmission Operators incorporate this information into their Black Start Plans designating these pipeline loads as priority loads.