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## **Item 7.3: Loss of Load Study Results**

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Board of Directors Meeting

ERCOT Public

July 16, 2013



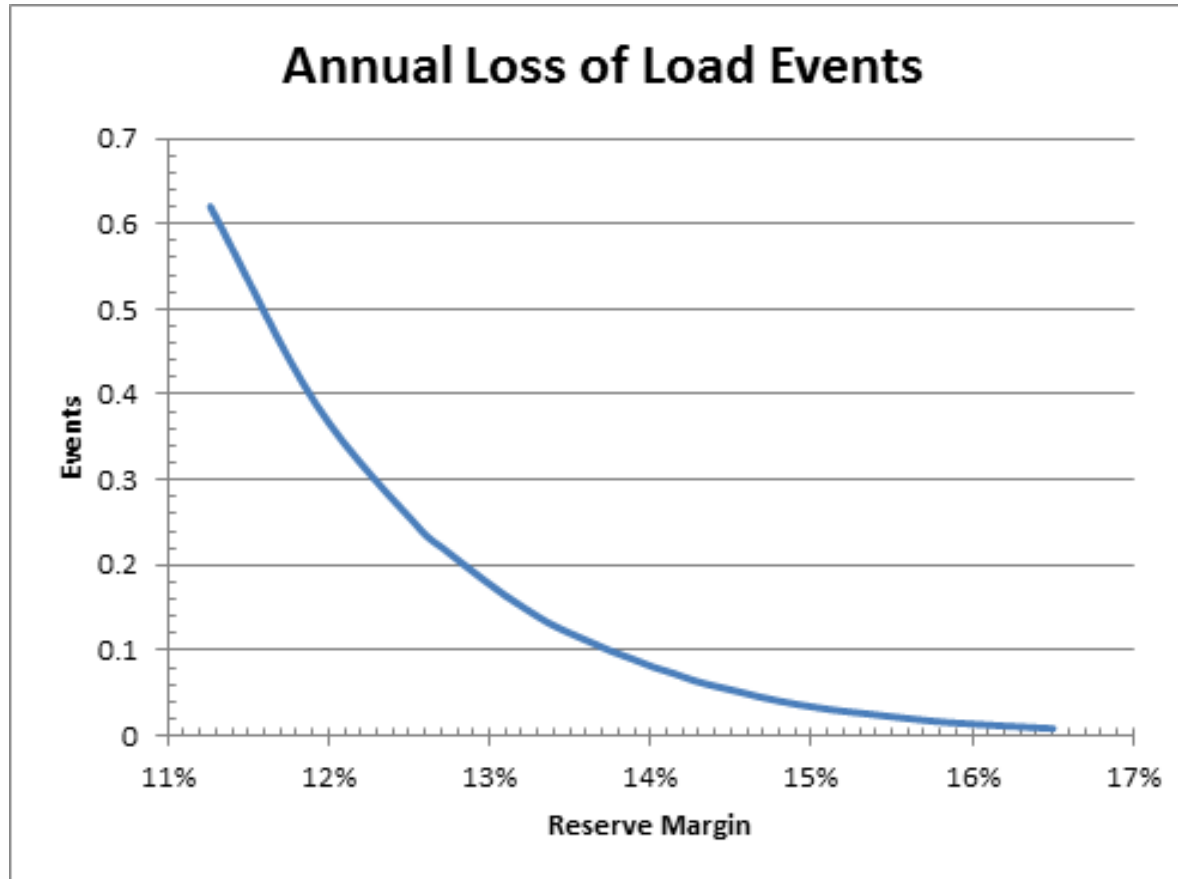
# Resource Adequacy Analysis in ERCOT

The analysis of long-term resource adequacy in ERCOT is conducted in two separate steps.

1. Comparison of forecasted loads to expected resources.
  - Published every six months in the Capacity, Demand and Reserves (CDR) Report.
  - Protocols stipulate criteria for inclusion of resources; the intent is to include resources that are expected to be available during scarcity conditions
  - The expected reserve margin is the amount of resources above forecasted load
2. LOLP Study: a mathematical analysis of the relationship between reserve margin levels and the risk of rotating outages.
  - Reserves are needed due to unit outages, in case loads are higher than expected, and to account for variable generation.
  - These “loss-of-load” analyses inform the development of a target reserve margin (based on a predetermined index of the desired level of reliability)
  - ERCOT currently uses a 1 event in 10 years standard to determine a recommended target reserve margin
  - The primary drivers of the likelihood of loss-of-load conditions in these studies are the reliability of the resource fleet and variability of the weather-driven load

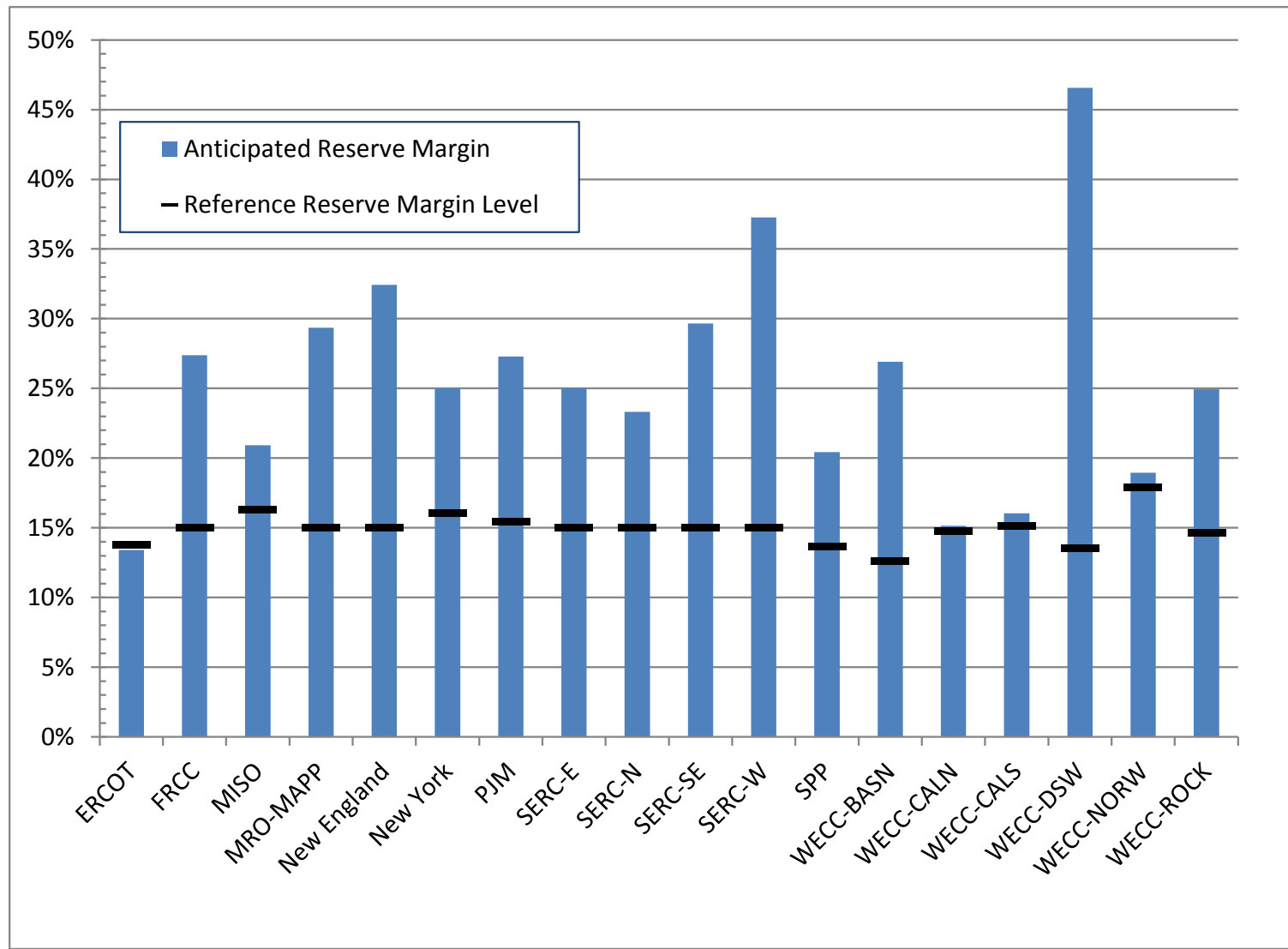
# Background: Developing a Target Reserve Margin

A loss-of-load study establishes the relationship between reserve margin and expected number of loss-of-load events. The following chart shows this relationship from the previous ERCOT study:



In order to establish a Target Reserve Margin, a reliability criteria has to be established. ERCOT has traditionally used a 1 event in 10 years, or 0.1 event per year standard (consistent with PJM, NE-ISO, Midwest ISO, and NY ISO)

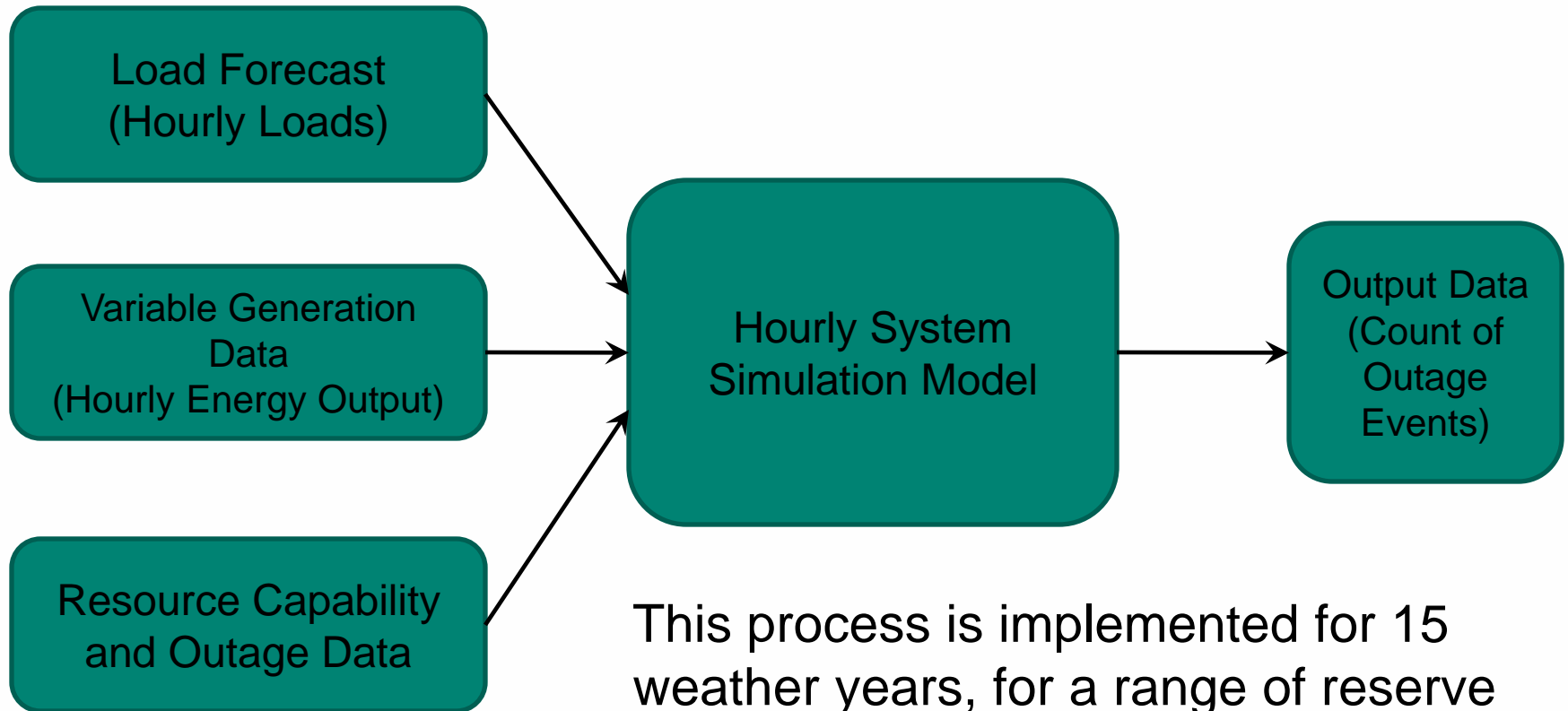
# Comparing ERCOT Reserve Margin and Target to Other Regions



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- Data from Tables on page 68 of the NERC 2012 Long-Term Reliability Assessment (Nov. 2012)
- Reference Reserve Margin levels reflect regional submittal or NERC default target level (15%)

# Loss-of-Load Study Process



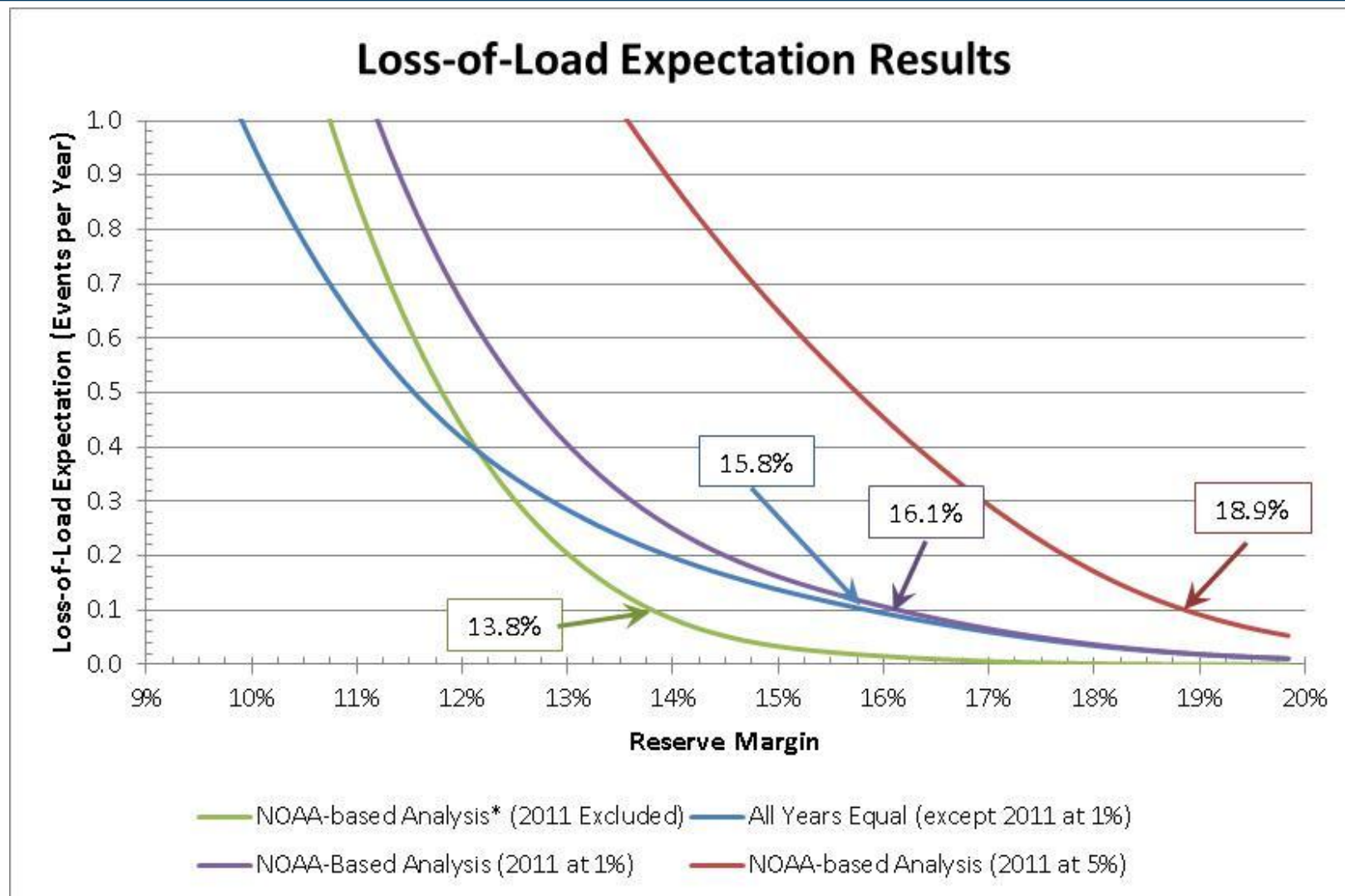
This process is implemented for 15 weather years, for a range of reserve margins, to develop a curve like the one shown on the previous slide

# Study Findings

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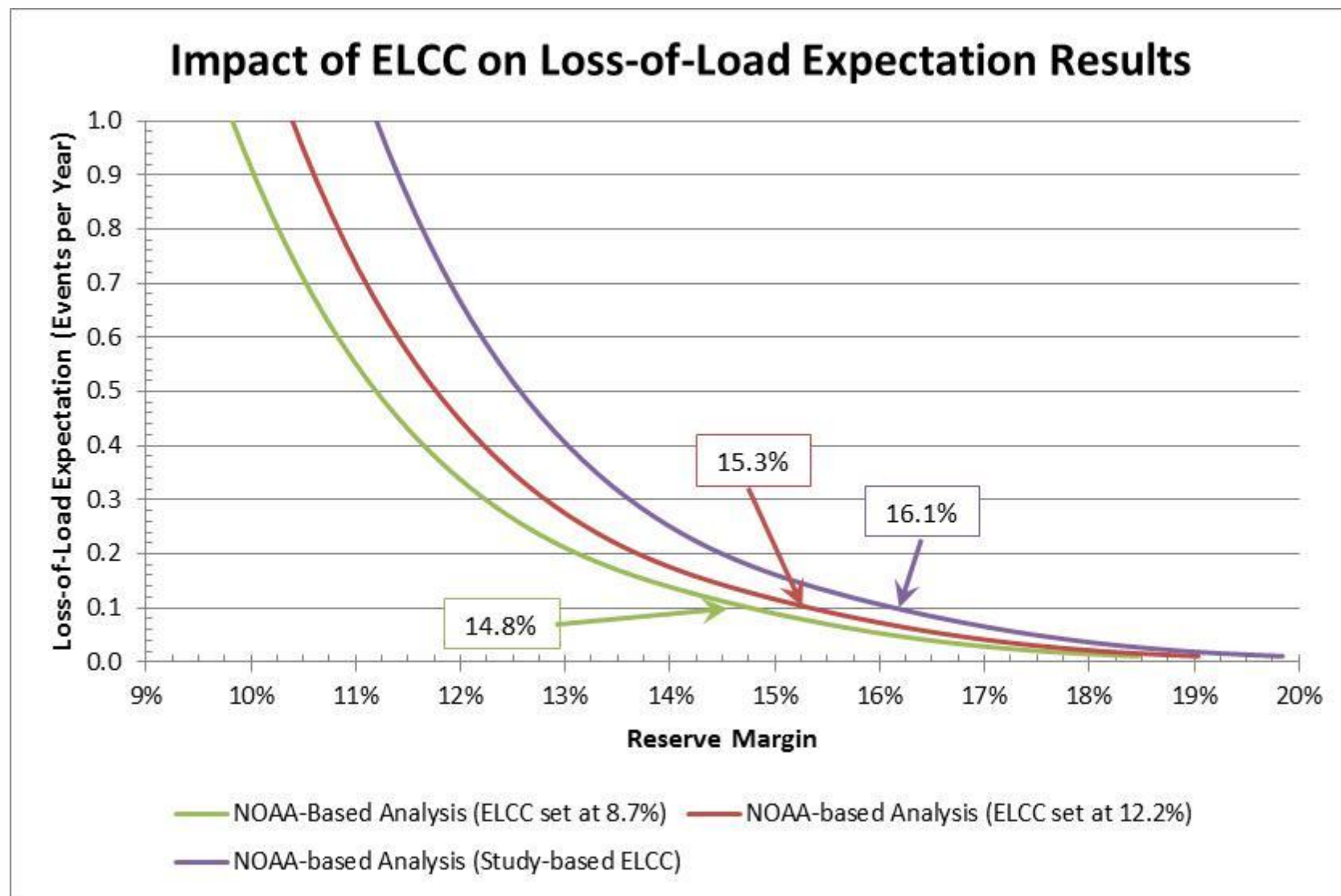
- Determination of the relationship between reserve margin and likelihood of loss-of-load events is heavily dependent on assumed likelihood of 2011 weather conditions
- Using a 1-event-in-10-years loss-of-load criteria leads to a target reserve margin of ~13.7 % to ~18.9% depending on weather year assumptions
- Study results indicate an effective load carrying capability of 14.2% for non-coastal wind resources, and 32.9% for coastal wind resources

# Loss-of-Load Study Results



\* ERCOT conducted an analysis of 100 years of weather data to determine the expected likelihood of each of the 15 weather years used in the study

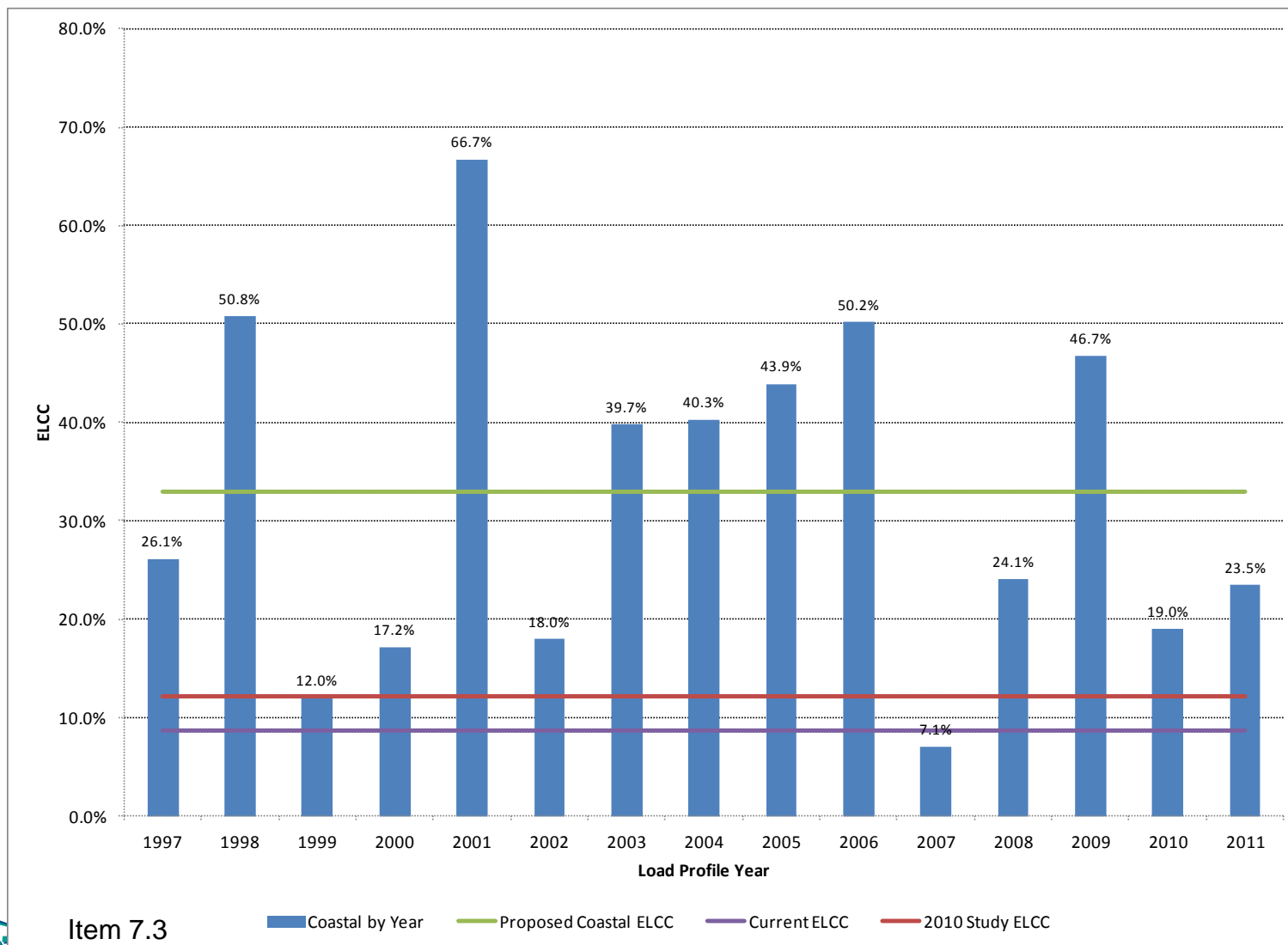
# Impact of Wind Capacity Assumption



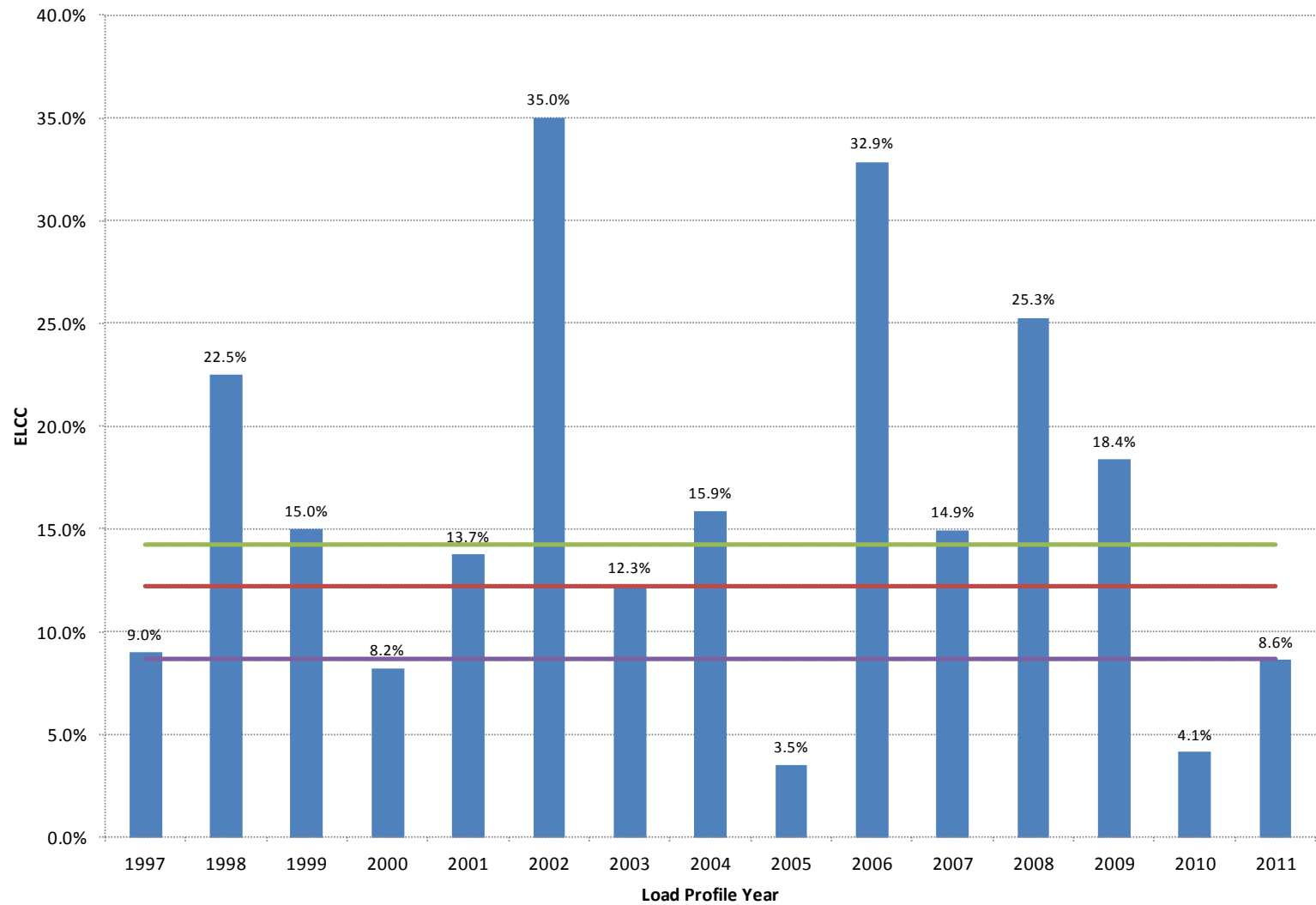


# Details of ELCC Results by Load Profile Year (Coastal Wind Resources)

The results of the ELCC calculation varies based on annual weather pattern



# Details of ELCC Results by Load Profile Year (Non-Coastal Wind)



# QUESTIONS / COMMENTS???

