



# Renewable Energy Integration Impacts Wholesale Market Design: ERCOT & SEEM

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## WEBINAR



- RTO Design Challenged by Renewable Energy Integrations
- ERCOT Redesign Discussion
- SEEM Creation
- Questions / Comments



- Resource Neutrality
- Fuel Agnostic
- Non-Discriminatory Economic Merit





LOCATIONAL MARGINAL PRICE = RTO HOLY GRAIL

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IPCI





# RENEWABLE ENERGY INTEGRATION

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RTO MARKET FOUNDATION CRACKS APPEARING

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Electrons can hardly be considered fungible anymore

1. 1 MW of wind capacity not as fungible as 1 MW natural gas capacity

Renewable energy resources have low or zero marginal cost

1. Poses an existential threat to single price capacity auctions and related RTO service
2. Market revenues will continue to degrade

Many suppliers don't contribute to energy price formation

1. Nuclear, wind & solar are "price takers"
2. Is this really competitive?

A flexible resource with meaningful operating costs must set the single clearing LMP paid to all suppliers

1. Renewable resources must rely on a carbon emitting fossil resource to set a positive LMP

## Out-of-Market revenue sources/compensating Fixes

- Renewable Energy Certificates
- Production or Investment Tax Credits
- Bilateral contracts from load serving utilities pursuant to state programs or commercial and industrial customers

## We seem to be moving to a post-marginal price world

- Clearly threatens LMP integrity
- Will this hurt DER participation in RTO markets?
- RTO reliability is highly dependent on price integrity

## Does it matter anyway?

- Increasing portion of the supply stack doesn't respond to price



Increasing percentage of intermittent energy means getting control of demand.

But how?

- 1 Reservations about exposing customers to volatile time of use prices
- 2 How price elastic are consumers?
- 3 Do we have the correct LMP to incent distributed energy resources?
- 4 LMP may be drowned out by increasing non-bypassable retail charges (e.g., T&D costs)

We are building out transmission to optimize renewable generation and manage its variability.

But...

- 1 We are socializing the costs and not assigning to the generator
- 2 This upends a great deal of the design purpose of LMPs and the infrastructure that has developed to execute on this design purpose
- 3 It removes locational advantage for generation proximate to load that would otherwise have been revealed in LMP
- 4 It violates the core RTO principle of Resource Neutrality

*"We are not tweaking on the edges, or making marginal changes, we are taking a blank-slate approach for a full redesign of this market to drive reliability. Full stop."*

Peter Lake

Chairman, Public Utility Commission of Texas





# TIMELINE

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NOVEMBER 12 ▶

Stakeholder comments on the redesign are due

DECEMBER 9 ▶

More discussions likely on PUC Workshop

DECEMBER 19

Deadline to release new blueprint

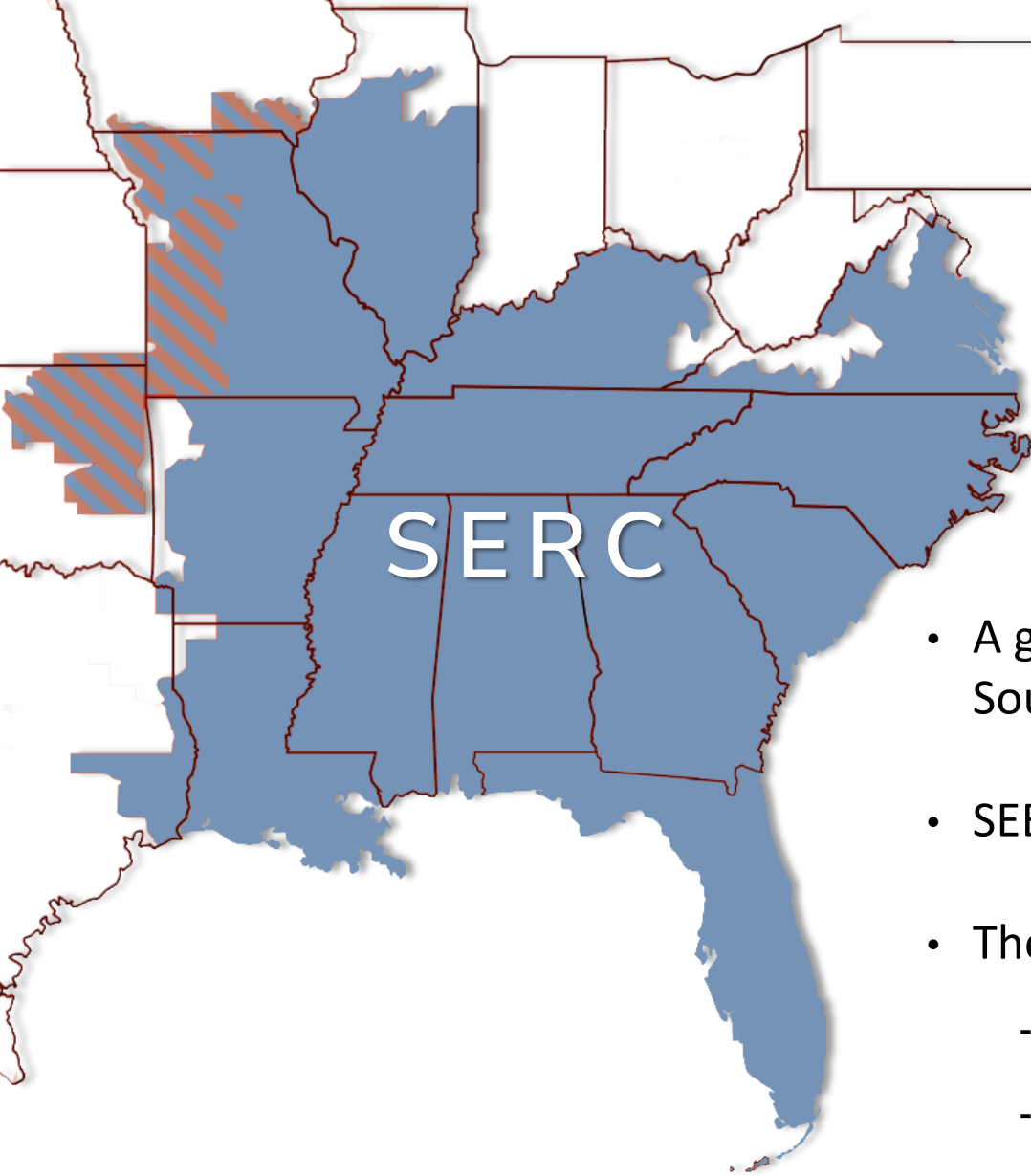
## WHAT'S LIKELY & POSSIBLE?

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- 1 Reforming the Operating Reserve Demand Curve
- 2 Emergency Response Service ( ERS)
- 3 Continuing ERCOT's development of fast-responding regulation service and contingency reserve service products
- 4 Load serving entity reliability obligation
  - Addresses resource adequacy concerns by introducing a formal reliability standard and a mechanism to ensure sufficient resources meet this standard
  - Fear of states largest retailers consolidating their positions
  - Detrimental to customers and retail competition?
  - Will it incent new generation?

# SEEM Overview

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- A group of Southeast utilities are working together to form the Southeast Energy Exchange Market (SEEM) to trade 15-min energy.
- SEEM's design was recently approved by FERC.
- There are three groups of SEEM players:
  - SEEM Participants who submit bids and offers
  - SEEM Transmission Service Providers who submit transmission limits
  - SEEM Administrators who run the SEEM market

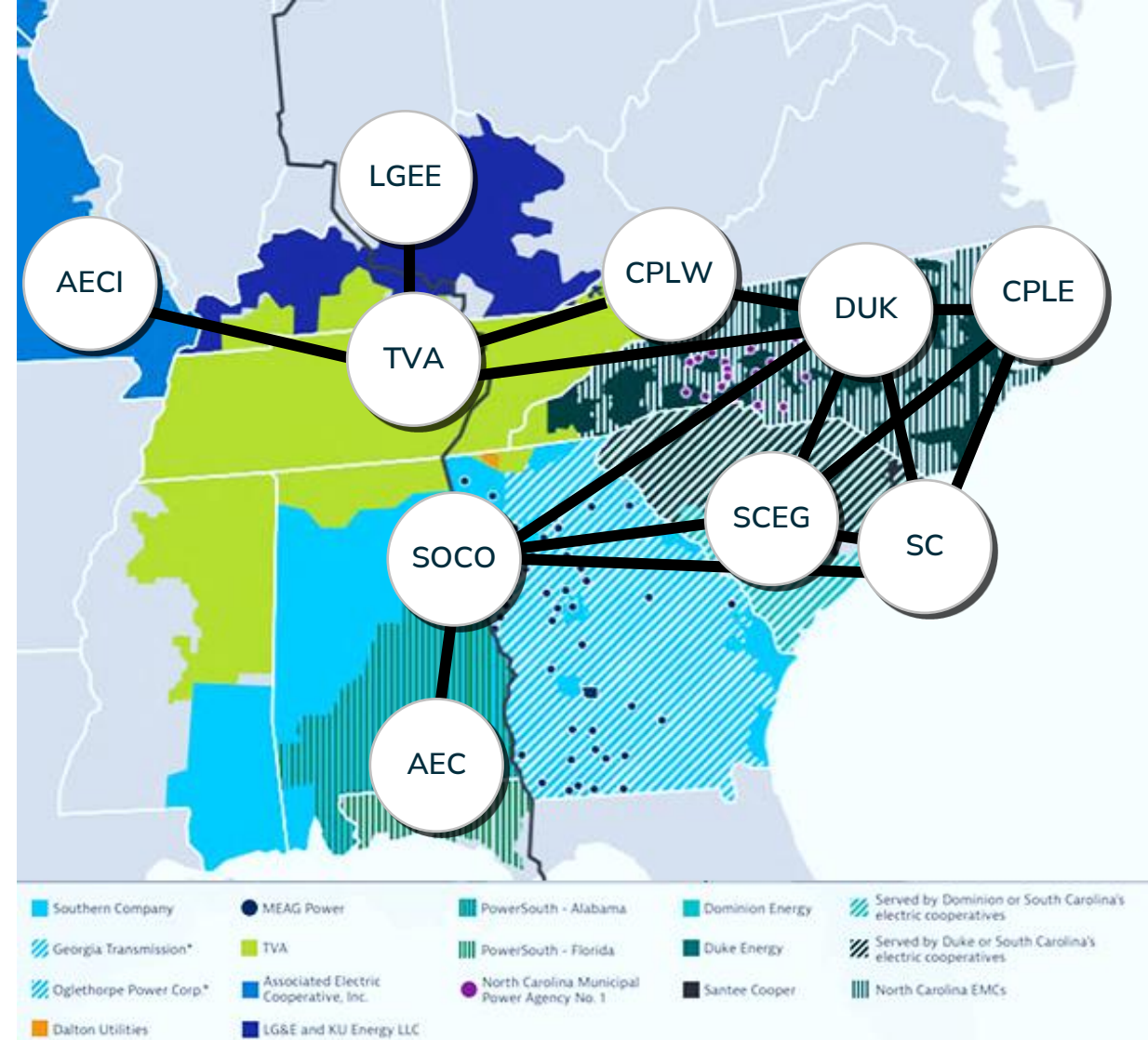


# Potential SEEM benefits

Based on independent study (published on SEEM website), potential short and long-term market savings can be significant.

Potential savings?

- **NEAR-TERM...** \$40 - \$50 million/year
- **LONG-TERM...** \$100 - \$150 million/year



## WHAT'S TO LIKE?



Simplicity



Adaptability



Stability

VOLUME

VALUE

RENEWABLE  
INTEGRATION

RELIABILITY





POWER COSTS, INC.

QUESTIONS ?

COMMENTS ?