

ERCOT Nodal Market Design: Q & A

The design of an electricity market is an important driver of behavior and prices. ERCOT may soon make a significant change in its structure, moving from a zonal pricing design to a nodal market. This paper compares the two designs.

What is the problem with today's zonal market design?

While ERCOT currently operates reliably, the proposed change from a zonal to a nodal design will allow ERCOT to increase reliability and more efficiently manage operations.

In today's market structure, ERCOT creates wholesale electricity prices within five broadly defined zones (see map below). Scheduling and deployment occurs at the zonal level, so Qualified Scheduling Entities¹ have flexibility in deployment of resources. Congestion can occur when the amount of power expected to flow on a transmission line exceeds the transfer capacity of the line.

Since congestion is currently managed at a portfolio level, resources that are most efficient (located closest to load zones) may not be used. ERCOT must guess how QSEs will deploy resources within a region and will use more costly out-of-merit energy to manage congestion as needed. The congestion costs are uplifted and paid by loads on a load-ratio share basis. As a result, some customers in low congestion areas are subsidizing customers in high congestion areas.

The inefficient dispatch is estimated to result in more than \$1 billion in excess annual production costs.²

The socialization of congestion costs results in the following:

- Lack of market signals to encourage development of generation in congested areas to relieve network constraints.
- Little differentiation in prices received by resources contributing to congestion and those that are not.

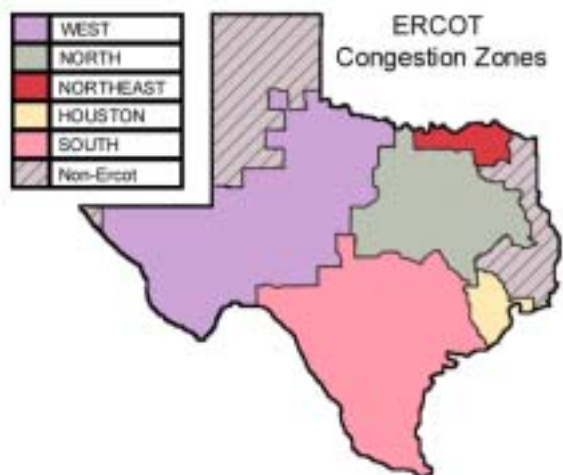
What is being proposed in a nodal market design for Texas?

The cornerstones of the Texas nodal market design are individual resource bidding and efficient economic dispatch.

In a nodal market, wholesale electricity prices are calculated for specific delivery points (called nodes) based on the demand, generation and transmission available to serve the local area. Resource-specific dispatch ensures that lower cost, more efficient plants would be used to their full capacity to manage both zonal and local congestion, resulting in lower overall energy costs to consumers.

What are the benefits on a switch to nodal?

- More efficient economic dispatch across ERCOT.
- Increased price transparency.
- Reduced uplift charges.
- Eliminates uncertainty and inefficiency from wholesale market by appropriately aligning incentives for resources to be located near loads.
- \$6 billion in savings to loads, estimated from more efficient congestion management.³
- Reduced cost of ancillary services deployed, resulting in less cost for loads.
- More robust day-ahead energy market.
- Encourages development of new, more efficient power plants.
- Reduces the potential for gaming by QSEs with large portfolios.



Nodal Evens Congestion Playing Field

The ultimate benefit to consumers of a move from zonal to nodal market design is greater reliability and more cost savings for end use customers.

How are congestion costs recovered today?

Local congestion costs are uplifted charges that are socialized among loads within ERCOT. While congestion varies within ERCOT, revenues from "congestion rights" auctions are allocated based on ERCOT load ratio share. Hence, there are no incentives for QSEs to use resources that relieve congestion because they are paid to curtail output in congested areas.

When will ERCOT switch to a nodal market design?

- The Public Utility Commission of Texas has achieved consensus on a move to a nodal market. Timing is still unclear. Current projections call for a Jan-Mar 2009 timeframe.
- Texas Nodal Team⁴ (TNT) will complete nodal protocols in August 2005. ERCOT Board approval expected on 9/20/05. Filing with Commission on 9/23/05.
- PUCT to create a nodal protocols docket requiring ERCOT to file the protocols by 9/23/05. Scope is to be determined but expected to be limited to specific areas.
- Allow 4-8 months of contested case hearings before nodal market protocols are completed.

- Implementation process to being when protocols are approved.

The actual date will depend on the time needed to approve nodal protocols and actual implementation.

North zone customers enjoy savings with nodal in all years (short-, med- and long-terms).

- Reduced NOx emissions state wide by an estimated 32,700 tons over 10 years via reliance on

Proposed changes include:

- 1) *Scheduling, bidding, and deployment at the resource level.*
 - 2) *Resource-specific ramp rates in dispatch and shift factors.*
 - 3) *Direct assignment of local congestion costs.*
 - 4) *Implementing an integrated Day Ahead market*
 - 5) *Creating financial incentives for market participants to follow schedules and instructions.*
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What impact will customers see when a nodal market is implemented?

- Increased access to market information and price transparency facilitates competitive markets.
- Expected annual savings of \$1 billion per year in electricity production.

A study by independent consultants Tabors, Caramanis & Associates, and KEMA Consulting estimate the following:

- The cost of serving electric consumers in all ERCOT zones would be reduced over the mid- and long-terms.
- Houston, West, Northeast, and

more efficient, lower emissions plants

Where do I go to get updated information?

More information on the Texas Nodal Team initiatives can be found at:

<http://www.ercot.com/tnt>

The Texas PUC website is also a good resource for information. Search under Project No. 28500-Activities related to the Implementation of a Nodal Market for the Electric Reliability Council of Texas.

<http://interchange.puc.state.tx.us/WebApp/Interchange/application/dbapps/filings/pgSearch.asp>

ERCOT Nodal Market Design (cont'd)


Who has provided input to the nodal market design?

The Texas Nodal Team (TNT) has been evaluating the need for a change to nodal market design since the team's inception in August 2003.

The team consists of representatives from investor-owned utilities, generators, retail electricity providers, consumers, non-opt-in-entities, and ERCOT. Over 300 people from 80 companies and organizations have provided input to TNT.

How many zones will be created?

The basic proposal is four main zones plus three non-opt-in-entirety zones.

Nodal =  x 35 million

The more load zones, the greater the incentives that retail electricity providers have to contract for supply from resources that are near the loads they serve.

Is SUEZ Energy Resources in favor of nodal?

SUEZ Energy Resources supports a nodal market because we believe it will result in a more efficient and stable market over time. However, we do not directly benefit from the switch to a nodal market and will

\$6,000,000,000

Estimated savings to loads from more efficient congestion management

continue to be a reliable and competitive REP under any market design.

Footnotes:

¹Qualified Scheduling Entity (QSE) refers to an ERCOT Market Participant that is authorized to submit schedules and ancillary services bids to ERCOT.

²Based on independent consultant study by Tabors, Caramanis & Associates.

³Independent cost benefit study by KEMA consulting and Charles River Associates.

⁴Texas Nodal Team refers to the collective group of stakeholders working to define Texas nodal market protocols.

Reasons Why Nodal Is Superior To Zonal Pricing

Zonal pricing can create market power in both the hypothetical zonal dispatch AND re-dispatch that doesn't exist in the actual power market under either nodal or inter-zonal pricing.

By reducing the response of demand in the constrained region to the exercise of locational market power, zonal pricing can make profitable the exercise of market power that is unprofitable under either nodal or inter-zonal pricing.

The zonal pricing and redispatch mechanism reduces the supply elasticity of energy across open interfaces, making profitable the exercise of market power that would be unprofitable under nodal pricing.

Nodal pricing is also superior when the potential for the exercise of locational market power exists, because nodal pricing permits the use of financial instruments such as Contracts For Differences, Transmission Congestion Contracts (TCCs), and price contingent TCCs as mechanisms to mitigate the locational market power.

These instruments aren't available as mitigation mechanisms for zonal pricing, precisely because financial commitments under zonal are not location-specific and can't provide sellers with financial incentives to supply power at the location required to mitigate market power.

"Nodal and Zonal Congestion Management and the Exercise of Market Power, June 10, 2000"

Scott M. Harvey (Harvard Univ) and William Hogan (Navigant Consulting)