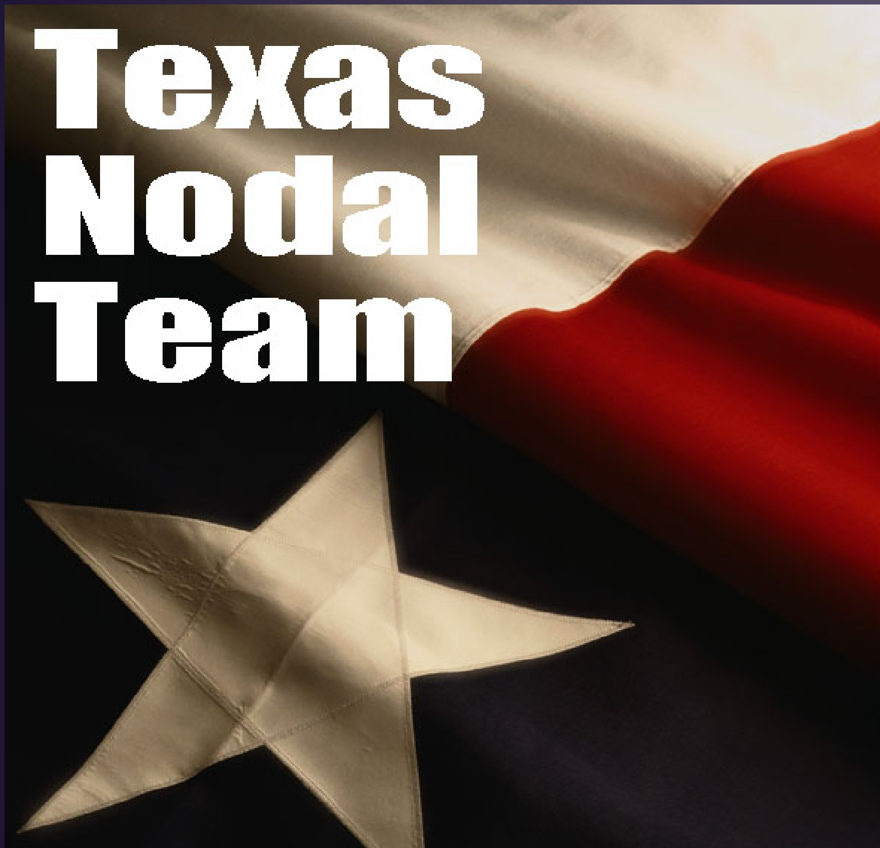

Board Update

Trip Doggett

Facilitator, Texas Nodal Team

December 14, 2004

Agenda

- Cost Benefit Study
- ERCOT Protocol Development
- Economist Issues
- November 15 Voting
- December 6 Voting
- Action Requested

Cost Benefit Study

- Posted comprehensive final report November 30
- http://www.ercot.com/TNT/default.cfm?func=documents&intGroupId=83&b
- Reviewed final report with TNT on December 6
- Intend to file by December 31

Cost Benefit Study History

- TNT formed the Cost-Benefit Concept Group (CBCG) to guide the Cost-Benefit Study effort. The group was chaired by Rick Covington. Vikki Gates Cuddy was co-leader of the group.

- In January 2004, the CBCG conducted a competitive process for the selection of a consultant to develop the Cost-Benefit Study. After selection, TCA and KEMA worked with CBGG to develop a detailed scope of work, and contracted with TCA/KEMA to perform work under this scope.

- TCA/KEMA and the CBCG jointly developed the assumptions to be used in the analyses. The study was conducted throughout 2004 under the direction of the CBCG. The CBCG reviewed critical assumptions and provided feedback throughout the study process.

- ERCOT staff provided input on matters related to the existing market design, current systems, and impacts experienced with the current market design.

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Cost Benefit Study
Study Elements

The study consisted of four elements:

- **Energy Impact Assessment (EIA)**—quantified impacts to the energy market, system dispatch, energy prices, and resulting production system costs. TCA conducted the EIA.
- **Backcast**—quantified optimized generation dispatch results for the ERCOT system for 2003 for comparison with those actually experienced. TCA conducted the Backcast.
- **Implementation Impact Assessment (IIA)**—provided quantitative and qualitative treatment of implementation startup costs, ongoing costs, and other transition-related impacts for ERCOT and its market participants. KEMA conducted the IIA.
- **Other Market Impact Assessment (OMIA)**—provided qualitative treatment of a variety of other measures of impact of market designs not captured directly in the EIA. TCA conducted the OMIA.

Cost Benefit Study
Regions and Market Segments

Each study element addressed impacts to regions, if applicable, and to the various Market segments:

Regions	Market Segments
North Zone	Investor-Owned Utilities
South Zone	Municipal Utilities
West Zone	Electric Cooperatives
Houston Zone	Independent Power Generators or Producers
	Independent Power Marketers
	Independent Retail Electric Providers
	Affiliated Retail Electric Providers

Cost Benefit Study
EIA Findings

The nodal Change Case is measured to produce average annual benefits of $76 million per year (corresponding to a ten-year net present value, or NPV, of $586 million) in reduced generation costs. For the nodal Change Case, the study measured a significant shift in value from the ERCOT market's generator segment to its load segments.

Year	Generation Cost Reduction of TNM Change Case Relative to Base Case		
	($M)	($/MWh)	(%)
2005	27.3	0.08	0.19
2006	58.6	0.17	0.42
2007	81.6	0.23	0.60
2008	99.5	0.27	0.73
2009	109.4	0.29	0.84
2010	46.4	0.12	0.36
2011	152.0	0.39	1.17
2012	147.8	0.37	1.07
2013	68.1	0.17	0.47
2014	(28.1)	(0.07)	-0.19
Total	762.7	—	—
Average	76.3	0.20	—
NPV	586.6	—	—

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Cost Benefit Study
IIA Findings

Implementation costs determined in the IIA result in a total market impact of –$108 million to –$157 million due to the increased capital and operating costs of the nodal market systems and support staff. Most of this cost will be borne directly by ERCOT, which is likely to pass the cost on to market participants. Implementation impacts to each market participant segment range from approximately –$9 million to –$15 million NPV for sophisticated market participants such as Investor-Owned Utilities and IPPs to –$1.3 to –$3 million NPV for small Retail Energy Providers. The impacts are based a range of estimated costs, as indicated by the TNT (high) and TNT (Low) results in the following table of overall NPV cost impacts by market segment.

Market Segment	TNT (high) ($K)	TNT (low) ($K)
ERCOT	76,305	59,764
Investor-Owned Utilities	16,295	10,371
Municipally Owned Utilities	13,782	8,533
Electric Cooperatives	13,577	8,584
Independent Power Producers	16,206	9,571
Independent Power Marketers	11,300	6,607
Independent Retail Electric Providers	3,159	1,446
No Segment Designation	6,132	2,808
Total	156,755	107,684

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Cost Benefit Study OMIA Findings

Significant **Other Market Impacts** found in the OMIA include an increase in complexity with the shift to the nodal market design. This is especially prevalent during the first few years of nodal market operations, and it disproportionately impacts small participants and participants whose business is limited to the ERCOT region. Other impacts are expected to include a risk shift, from today's load serving entities to transmission rights holders under the nodal model, resulting from the derating of transmission rights and from the direct assignment of the marginal value of local congestion. The application of new algorithms and the implementation of other systems with the nodal market design create other risks of unexpected market outcomes. Qualitative benefits include ERCOT's improved ability to manage the system with unit-specific bids rather than portfolio bids, and the resulting increased system efficiency and increased transparency of prices at specific locations.

The two alternative change cases did not result in significantly lower implementation costs. Qualitatively, the Replication Change Case offers a reduction in risk given the use of algorithms and systems already in use in ISO-NE. The Nodal Light case has some drawbacks relative to the TNM, given its simplified system representation.

Cost Benefit Study Backcast Findings

In the **Backcast analysis**, the pattern of simulated results and actual system results were substantially similar, but there were some significant differences. In the simulated case, combined-cycle resources generated more than was actually the case, and steam-turbine gas plants generated less. These differences, when priced, result in a difference of approximately $1 billion between simulated and actual system cost, with simulated being less than actual. This difference can be attributed to some combination of two drivers, whose relative impacts could not be isolated given the nature of the analysis: (1) simplifications in the comparison process and (2) actual differences in efficiencies between the market behavior and the simulated optimal outcome.

Cost Benefit Study Conclusion

Although the three major elements of the study cannot be combined to produce a single conclusion with respect to the quantitative merits of implementing a nodal market in ERCOT, the potential savings found in the Energy Impact Assessment, relative to the Implementation costs found in the Implementation Impact Assessment, suggest that the benefits of the TNM could outweigh the costs for the ERCOT region as a whole. The report identifies some study assumptions that may have resulted in an overestimate of the energy impacts, including for example siting assumptions based almost entirely on energy economics, but this is not likely to materially change the preponderance of savings over costs.

The qualitative impacts are both positive and negative. Although it seems unlikely that the qualitative impacts could outweigh the quantitative impacts, it should be recognized that many of these other impacts tend to adversely affect smaller and regional market participants disproportionately.

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ERCOT Protocol Development

- Round 2 started November 1
- Completed Round 2 final review of all sections that should remain unchanged by the economist’s comments.
- Starting Round 2 intermediate review of sections impacted by economist’s recommendations on December 7.
- Round 2 final review of sections impacted by economist’s recommendations scheduled to begin in late January.

Economist Issues

- On November 8, we decided to adopt:
  - Addition of Co-Optimization of AS and energy in the Day-Ahead Energy Market (DAEM)
  - Change in the Reliability Unit Commitment (RUC) allocation multiplier
  - Creation of a demand curve for a small quantity of Responsive Reserve Service
- We decided not to adopt:
  - A must-offer in DAEM
  - ERCOT “pre-commitment” of units in DAEM that it deems required for the following operating day
  - Any zonal allocation of RUC costs
  - Allocation of Congestion Revenue Rights to Loads
- On November 15, we decided to adopt:
  - Send Section 6.8.2 Uninstructed Resource Parameters to ROS
  - Greer’s proposed DAEM changes
  - Fully fund CRRs, with offer floors, CRRs not sold on radial lines with resource on either end
  - Alternate settlement for CRR Options
  - Allocation of CRR Auction Revenues to Loads
- Changes adopted will be incorporated in the Round 2 Protocol review process.

November 15 Voting

Vote	Result
Motion to send proposed revisions to 6.8.2.1, Generation Resource Base Point Deviation Charge, to ROS for their evaluation.	Approved by a ballot vote of 95.2% in favor and 4.8% opposed.
Motion to approve: - Revised DAEM white paper as amended during the November 15, 2004 TNT General Session, allowing NOIEs to carry CRR Options to Real-Time up to next day's peak load level - CRR Mitigation (offer floors) - No CRR derate (uplift shortfall to CRR holders pro-rata, includes surplus account) - CRR Auction Revenue allocated zonally to load for source and sink in same zone, otherwise ERCOT–wide load ratio share.	Rejected by a ballot vote of 64.2% in favor and 35.8% opposed.

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November 15 Voting (cont)

Vote	Result
Motion to approve: - Revised DAEM white paper as amended during the November 15, 2004 TNT General Session, allowing NOIEs to carry CRR Options to Real-Time, up to 110% of next day's peak load level - CRR Mitigation (with offer floors) - No CRR derate (uplift shortfall to CRR holders pro-rata, includes surplus account) - CRR Auction Revenue allocated zonally to load for source and sink in same zone, otherwise ERCOT–wide load ratio share.	Approved by a ballot vote of 83.8% in favor and 16.2% opposed.

November 15 Voting (cont)

Vote	Result
Motion to simplify settlement of Point-To-Point CRR Options to settle at a price equal to the settlement price at the point of withdrawal minus the settlement price at the point of injection, provided that the option instrument's price must be 0 or greater.	Approved by a ballot vote of 90.5% in favor and 9.5% opposed.

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December 6 Voting

Vote	Result
Motion that: 1) The Cost-Benefit Study produced by Tabors Caramanis & Associates and KEMA Consulting, Inc. (KEMA) meets the requirements of the PUCT Substantive Rule 25.501(m). 2) Except as specifically stated above, the TNT as a group does not either approve or disapprove of the contents and conclusions of the Cost-Benefit Study. 3) Each TNT member reserves the right to take any position regarding the Cost Benefit Study at the PUCT or elsewhere. 4) TNT recommends that ERCOT file the Cost-Benefit Study at the PUCT.	Approved by a unanimous voice vote. Representatives from all seven segments were present.

December 6 Voting (cont.)

Vote	Result
Motion to replace Section 17.3 with "The Independent Market Monitor will be finalized at the end of the 2005 Legislative Session."	Approved by a majority voice vote, with one opposed by the City of Dallas, and abstentions by OPC, Walmart, First Choice, Cirro, Hino, TriEagle Energy, Spark Energy and Utility Choice. Representatives from all seven segments were present.

Texas Nodal Team

Action Requested
Market Design Elements

- Request the Board approve the following revisions to the Texas Nodal Market Design elements:
  - Changes to the Day-Ahead Energy Market, as defined in red-lined comments in the Board approved Day-Ahead Energy Market white paper (Attachment A)
  - Changes to Congestion Revenue Rights, as defined in red-lined comments in the Board approved CMCG white paper (Attachment B)
  - Addition of offer floors as defined in red-lined comments in the Board approved Market Mitigation white paper (Attachment C)