

ERCOT Nodal Market Simulation of the proposed CREZ Wind Expansion (2014)



1/20/2010

LCG CONSULTING

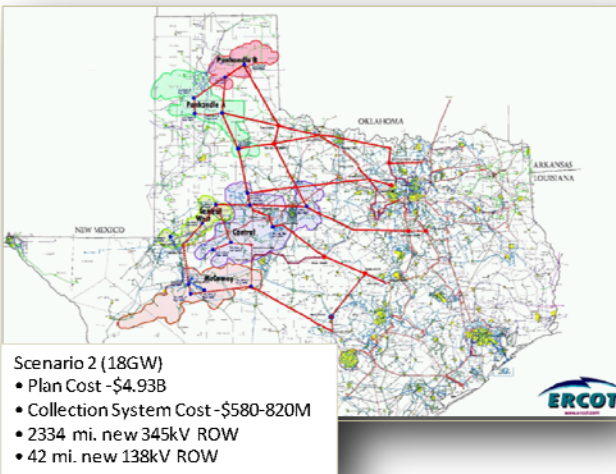
4962 El Camino Real, Suite 112, Los Altos, CA 94022

Tel: 650-962-9610, Fax: 650-962-9615

www.EnergyOnline.com

LCG CONSULTING has released a report on ERCOT Electricity Market 2014 - Simulation of the proposed CREZ wind expansion under the nodal market protocol. This report summarizes the results of extensive hourly simulations of the projected CREZ scenario 2.

The market forecasts and economic analyses are based upon sophisticated, hourly simulations of the entire ERCOT wholesale power market for year 2014 using LCG's proprietary UPLAN Network Power Model (UPLAN-NPM) and PLATO database for ERCOT. UPLAN simulates the



UPLAN Network Power Model replicates the behavior of regional power markets and power systems to simulate the financial and physical operations of entire grids. It simulates the bidding process for the Energy and Ancillary Service markets and dispatches generators hourly, using region-specific protocols. UPLAN is extensively used in ERCOT for zonal and nodal studies for various stakeholders including ERCOT ISO. It is typically utilized to assess business risks associated with capital investments in new and existing generation and transmission assets.

electrical network and the interacting energy and ancillary services markets. It optimizes generation and transmission simultaneously which is necessary for evaluating renewable technologies such as wind, solar, and storage technologies. The simulation also includes the proposed additional generation such as coal, gas, and wind.

The report includes forecasts for LMPs, A/S prices, hub prices, zonal prices, and congestion costs (CRRs). The report can be customized to include additional details such as generator performance, hourly LMPs, transmission congestion, and other information of interest.

Deliverables

A brief report containing the following:

- Summary of Input Assumptions:
 - ✓ Electricity Demand Forecast
 - ✓ Generation Capacity by Fuel Type and by zone
 - ✓ Transmission Constraints
- Hourly hub prices for West 345, North 345, South 345, Houston 345, ERCOT bus average and ERCOT hub average
- Hourly zonal prices

Should you be interested in a preview of the report via webcast, please contact

Julie.Chien@energyonline.com

Table of Contents

1. Introduction.....1

2. Study Approach2

3. ERCOT Market Operations3

 3.1 Zonal market operations4

 3.1.1 Energy & Ancillary Service Markets.....4

 3.1.2 Congestion management and TCR4

 3.2 Nodal market operations5

 3.3 Recent Developments5

 3.3.1 Energy Demand6

 3.3.2 Generation Capacity.....7

 3.3.3 Energy Price Trends.....8

4. Wind Energy Development14

 4.1 Wind Energy in Texas14

 4.2 Competitive Renewable Energy Zones (CREZ).....16

 4.3 Texas Wind Quality16

5. Key Assumptions for Modeling ERCOT 201419

 5.1 Electricity Demand19

 5.2 Generation.....19

 5.3 Fuel Prices.....20

 5.4 Transmission Network.....21

6. Nodal Market Simulation Results23

 6.1 Load Weighted Zonal Prices.....23

 6.2 Hub Prices25

 6.3 Generation.....26

 6.4 Congestion27

6.5 A/S Price	28
6.6 Zonal Flow	28
6.7 Wind Curtailment.....	28
Appendix A. ERCOT Nodal Results	A-28
A.1 Example of LMPs	A-28
A.2 Example of Generation Costs and Revenues	A-28
A.4 List of available Customized Hourly Results	A-28
A.4 Example of a Congestion Analysis.....	A-28