ERCOT Introduction

Key Features of the ERCOT Grid

- Contained entirely in Texas
- Represents 85% of Texas Load
- ~80,000 MW of generation capacity
- ~41,000 miles of transmission lines
Key Features of the ERCOT Grid

- Electrical island
- Interconnections to other grids
  - DC Ties
  - Block Load Transfers
ERCOT Operational Concepts

- ERCOT’s Primary Responsibility is Reliability
- Match generation with demand
- Operate transmission system within established limits

ERCOT facilitates competitive markets to help achieve reliability.
ERCOT dispatches *Energy* to follow the system demand.

ERCOT must also ensure sufficient *Capacity* is on-line to meet the forecasted demand.
More about Capacity

Reserved Ancillary Service Capacities

Ancillary Service Capacities are reserved for responding quickly to changing conditions.

System Capacity

System Demand

Forecast
Ancillary Service Capacity

- Three types of Ancillary Service Capacities
- Different purposes and response times
ERCOT Operational Concepts

- Transmission Congestion
- Generators and Loads separated by distance
- Transmission system has limits

Congestion management keeps transmission system operating within limits
ERCOT Operational Concepts

Network Operations Model

Models allow ERCOT to:
- “See” grid at any point in time
- Predict how various actions affect grid
Market Participants
Market Participants

- LSE
- QSE
- Power Marketer
- CRR Account Holder
- IMM Independent Market Monitor
- PUCT Public Utility Commission of Texas

Flow:
- Wholesale Settlement
- Operations & Settlement
- Retail Settlement
- Reporting
- Data
- Oversight
- Trades
- Operations
Wholesale Market Design
Nodal Market Overview

- **Registration**
  - Market Participants
  - Qualifications
  - Assets
  - Relationships

- **CRR Auction**
  - Annual & Monthly Auctions
  - CRR Offers and Bids
  - PTP Options and Obligations
  - Flowgate Rights

- **Reliability Unit Commitment**
  - Transmission Security Analysis
  - Resource commitment
  - Day-Ahead RUC
  - Hourly RUC

- **Real-Time Operations**
  - Network Security Analysis
  - Security Constrained Economic Dispatch (SCED)
  - 5 Minutes Dispatch
  - Load Frequency Control (LFC)

- **Market Information System (MIS)**
  - Access Market Reports
  - Submit Market Inputs
  - Download Information
  - Review Market Outputs
  - Submit Market Inputs
  - Download Information
The Day-Ahead Market

- Centralized Forward Market
- Buy and sell Energy
- Sell Ancillary Services to ERCOT
- Forward market provides price certainty
Real-Time Operations

- Manage reliability
  - Match generation with demand
  - Operate transmission system within established limits
- Operate the system at least cost
SCED Dispatch Instructions

• At least every 5 minutes
• Based on economics
Load Frequency Control (LFC)
• Matches generation with demand
• Responds to frequency deviations
• Deploys Regulation Reserve Service

Real-Time Operations

Frequency (Hz)
60.0000

Base point

5 minutes

Base point

5 minutes

Base point

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Accessing additional information

ERCOT Protocols
http://www.ercot.com/mktrules/nprotocols/

ERCOT Training
http://www.ercot.com/services/training/

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