

# Memorandum



CITY OF DALLAS

DATE February 10, 2012

TO The Honorable Mayor and Members of the City Council

SUBJECT Current Status of the Electric Market in Texas

On Wednesday February 15, 2012 you will be briefed on the Current Status of the Electric Market in Texas. In addition to the briefing presented by staff, the Electric Reliability Council of Texas (ERCOT) will provide an "Update on Resource Adequacy in the ERCOT Region" and Oncor will present "Our ERCOT System Emergency Response". The briefings are attached for your review.

If you have questions, please let me know.

A handwritten signature in cursive script that reads "Jeanne Chipperfield".

Jeanne Chipperfield  
Chief Financial Officer

## Attachments

C: Mary K. Suhm, City Manager  
Rosa A. Rios, Acting City Secretary  
Thomas P. Perkins, Jr., City Attorney  
Craig D. Kinton, City Auditor  
C. Victor Lander, Administrative Judge  
A.C. Gonzalez, First Assistant City Manager  
Ryan S. Evans, Assistant City Manager  
Jill A. Jordan, P.E., Assistant City Manager  
Forest E. Turner, Assistant City Manager  
Joey Zapata, Assistant City Manager  
Stephanie Peques-Cooper, Assistant to the City Manager  
Jack Ireland, Director, Office of Financial Services

# Current Status of the Electric Market in Texas

City Council Briefing  
February 15, 2012



# Purpose

- Provide an overview of the Electric Market in Texas
- Discuss ERCOT's role in the market
- Review rolling blackouts
- Consider challenges to building new generation

# Texas Electric Market Overview

- Prior to deregulation in 2002, Electric Utilities were vertically integrated and provided the following:
  - Generation
  - Transmission and Distribution
  - Customer service and billing
  - System reliability
- Regulated by the City and/or the State of Texas

# Texas Electric Market Overview (cont.)

- Electric industry was deregulated with the adoption of SB7 in 1999
  - Fully implemented January 1, 2002 for the majority of the State of Texas
    - Parts of west Texas, the panhandle and south east Texas remain regulated
  - Investor Owned Utilities (like TXU) were required to split into 3 separate companies
    1. Retail Electric Providers (TXU Energy)
    2. Independent Generators (Luminant)
    3. Transmission and Distribution Utilities (Oncor)



# Texas Electric Market Overview (cont.)

## 1. Retail Electric Providers (REPs)

- Buy power wholesale from Independent Generators and Power Marketers
- Sell electricity to retail customers
- Provide billing and customer service
- 108 REPs registered with the Public Utility Commission (PUC)

# Texas Electric Market Overview (cont.)

## 2. Independent Generators

- Own generation resources
- Sell electricity to REPs and Power Marketers at market prices
- 251 generating companies registered with the PUC
- 550 generating units in ERCOT fueled by:
  - Natural Gas
  - Coal
  - Nuclear
  - Wind
  - Other (hydro, solar, bio-mass, diesel)

# Texas Electric Market Overview (cont.)

## 3. Transmission and Distribution Utilities

- Own the transmission lines, distribution lines and meters
- Regulated by the City and PUC
- Deliver power from generators to end use customers for REPs
- Charge a regulated delivery fee which REPs pass on to customers
- Responsible for maintaining the T&D system
- Read meters and physically connect & disconnect customers at the request of REPs



# Texas Electric Market Overview (cont.)

- In addition to splitting electric utilities into 3 separate companies, deregulation required the creation of an Independent System Operator (ISO)
  - Manages the flow of electricity over the system wide transmission network
  - Facilitates the day ahead & real time markets
  - Acts as a clearing house for data between T&D utility and REPs
  - The Electric Reliability Council of Texas (ERCOT) was named the ISO by the Public Utility Commission of Texas August 21, 1996
    - Membership based non-profit Corporation

# ERCOT's Role

- Manages flow of electricity to 22 million customers
  - 85% of the total load in Texas
  - 75% of the land mass in Texas
- Balances generation to load
  - Electricity can not be stored
  - Supply and demand must always match
  - If voltage or frequency drop below certain levels the system will shut down
    - If shut down, it takes over 24 hours to fully restore

# ERCOT's Role (cont.)

- Manage energy flows over the 40,000 mile transmission grid
  - Dispatches all 550 generating units to meet system energy demands and maintain system voltage and frequency
- Operate the Day Ahead Energy Market
  - Generators and REPs buy and sell energy for delivery the next day by an auction basis
- Operate the Real Time Energy Market
- Operate the Ancillary Service Market

# ERCOT's Role (cont.)

- Maintain customer database of all retail customers on the system
  - Facilitate customer switches between REPs
  - Transfer meter read data from T&D utility to REPs for customer billing purposes
  - Maintain load profiles for all customers to facilitate daily settlement of wholesale energy
- Provide daily settlement statements to generators and REPs for energy and ancillary services bought and sold

# Rolling Blackouts

- If available generation is inadequate to meet system load, ERCOT may order T&D utilities (such as Oncor) to shed load
  - Each T&D utility is ordered to shed load based on its proportionate share of the total system load
  - Utilities shed load by instituting rolling blackouts
  - Individual feeders are switched off for 15 minutes at a time and may be cycled off and on multiple times depending on the duration of the emergency
- ERCOT has only had to shed load 3 times in the past 30 years

# Rolling Blackouts (cont.)

## ■ December 1989 Rolling Blackouts

- Severe winter storms caused temperatures to remain in the teens for several days
- Natural gas was curtailed to many electric generating plants to supply gas for home heating
- The event lasted less than an hour and load was only cycled off one time
- This was pre-deregulation

# Rolling Blackouts (cont.)

## ■ April 2006 Rolling Blackouts

- Many generators were shut down for seasonal maintenance
- A dry-line expected to keep cool weather over much of the state, pushed further to the east than forecast
- Hot weather behind the dry-line caused demand to exceed the available supply
- Event lasted approximately 5 hours beginning in the late afternoon

# Rolling Blackouts (cont.)

## ■ February 2011 Rolling Blackouts

- ERCOT had forecast high system demand based on weather and had sufficient resources scheduled to meet that demand
- 12,000 MW of generation was scheduled to be off line for maintenance
  - Maintenance is often scheduled this time of year to assure availability during summer peaks



# Rolling Blackouts (cont.)

- Approximately 5:00 AM on 2/2/2011 several generators that were scheduled to come online began reporting weather related problems
  - Frozen water lines used for plant cooling, frozen control systems and gauges etc,
- ERCOT called for all available plants to come online to meet demand
  - Several gas fired plants could not respond due to natural gas curtailments

# Rolling Blackouts (cont.)

- ERCOT deployed Emergency Interruptible Load Service (EILS) and Loads Acting As Resources (LAARs)
  - EILS and LAARs are customers who have contracted to have their service interrupted during system emergencies
  - EILS remained deployed for 28 hours
- Due to a system wide shortage of generation, ERCOT requested the T&D utilities (such as Oncor) to shed firm load
- The event lasted 8 hours
  - To be discussed further by Oncor in its briefing later today

# Challenges to Building Additional Generation

## ■ Low Energy Prices

- The wholesale price of electricity in Texas follows natural gas prices
  - 60% of generation in Texas is natural gas
  - Market prices are set by the marginal unit
    - Normally gas fired
    - In the ERCOT market bids to sell electricity are selected from the lowest to the highest needed to meet demand, then all generators are paid the highest accepted bid price known as the market clearing price of Energy (MCPE)
- Natural gas is selling at a 10 year low
- Current energy prices may not provide sufficient incentive to build new generation

# Challenges to Building Additional Generation(cont.)

## ■ EPA Cross State Air Pollution Rule (CSAPR)

- Drastically reduced the allowable emissions from coal plants effective January 1, 2012
- Older plants will be out of service while being retrofitted with newer emissions controls
- Luminant announced it would close two coal plants, Monticello 1 & 2 (1,130 MW)
  - Not economic to upgrade these plants
- Federal Court stayed the implementation of CSAPR due to pending litigation
  - Hearing set for April 2012

# Challenges to Building Additional Generation(cont.)

- Other proposed EPA regulations may have significant impacts as well
  - Add significant cost to building and/or operating generating plants
  - Add regulatory uncertainty

# Challenges to Building Additional Generation(cont.)

## ■ Ongoing drought conditions

- Most electric generators require water for cooling purposes
- As lake levels drop, their ability to cool the generating plant is reduced limiting the amount of time the plant can operate
- If lake levels drop below the depth of the plants water intake the generating plant would be required to shut down
- Uncertainty of water supply adds risk to building new generation
- May limit production from existing generation

# Challenges to Building Additional Generation(cont.)

## ■ Base load plants

- Run the majority of the time to meet base level consumption needs
- Usually large plants and the most efficient technology available at the time they were built
  - Very expensive to build
  - Complicated permitting process
  - Often these plants are coal fired, nuclear or combined cycle natural gas
  - Normally takes several years to plan and build
- May be difficult to obtain financing given the uncertainty in the market

# Challenges to Building Additional Generation(cont.)

- Primary need in ERCOT is for peaking or seasonal plants
  - Smaller plants with fast start up times
  - Typically natural gas fired
    - Can be built faster
    - Initial cost is less
    - Permitting is less complicated
    - Operating cost is subject to fluctuations in the natural gas market
  - Typically run 60 to 120 days a year to meet seasonal system needs
    - May be uneconomic given limited run time



# Challenges to Building Additional Generation(cont.)

## ■ Wind resources

- Must locate where wind blows and not where electricity is needed
- Only generate when wind is blowing
  - Typically the wind is not blowing in west Texas during the summer peak afternoon period but is blowing at night when demand is less
  - Wind facilities reduce the hours traditional plants are required to run, but they do not significantly reduce capacity of traditional plants needed to maintain reliability
- Wind projects are dependent on continued tax incentives and subsidies

# What's Next

- Update on Resource Adequacy in the ERCOT Region
  - To be Briefed by Dan Woodfin
    - Director, System Planning
    - ERCOT
- Our ERCOT System Emergency Response
  - To be Briefed by Charles Elk
    - Vice President Dallas Customer Operations
    - Oncor Electric Delivery

# Questions ?

