ERCOT's Competitive Markets And The Environment

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Sam R Jones, PE
ERCOT COO

What Is ERCOT?

The Electric Reliability Council Of Texas

- An Intra-state, single point of control Interconnection
- Formed in 1941 to support the World War II effort
- Continued, following the war, for reliability reasons
- Today, it is the smallest of three Interconnects in the US
  - 37,000 miles of transmission lines
  - ~75,000 MW of electric generation
  - 60,157 MW peak load in 2003 – 4.4% increase
  - 85% of the electrical load in Texas
- Began wholesale competition in 1996
- Introduced retail competition in 2001

Why Are Electric Utilities Interconnected?

- First electric utilities were for street lighting and trolleys
- Electric utilities began to interconnect around 1916
  - Economy was probably the first driving factor
  - Reliability was recognized as a benefit
- Monopolies quickly occurred – the Federal Power Commission (now FERC) was formed in 1935 to regulate the monopolies
- Eventually four Interconnections formed in North America
  - Eastern
  - Western
  - Quebec
  - Texas

Traditional Bundled Electric Utility Model

- Certified customer service area
- Fully regulated – guaranteed rate of return
- Owns its generation or has long term contracts
- System planning and construction based on known load and generation locations
- Pass through fuel adjustments
- Some have qualifying facility generation in their service area
- This model is changing in many areas

ERCOT's First Evolution Wholesale Competition

- Computerized power brokering system began in 1980
- ERCOT developed access and tariffs for private generation in 1986
- Texas Legislature passed wholesale competition bill in 1995
- ERCOT Independent System Operator (ISO) formed in 1996
  - Equal Access to the grid for all generation, load and marketers
  - Single point of coordination for the Interconnection replaced individual control by the traditional utilities
  - Utilities were still vertically integrated, but used more independent generation for economy purposes
  - More level playing field
- Other areas of the country began similar changes

Utility Effects Of The New Competitive Model

- Significant amount of new, efficient, independently owned electric generation was planned and built
- Utilities began to use the new, cheaper generation
- The existing transmission system was no longer adequate due to the changing generation patterns
  - New transmission was needed to interconnect the new generators
  - New transmission was needed to allow better customer access to the new generators
  - Since 1999 - 609 circuit miles of 345 kV and 164 circuit miles of 138 kV transmission lines have been added in ERCOT – more are planned and underway

Environmental Effects Of The New Competitive Model

- More efficient use of natural gas – less consumed for the same amount of electrical energy produced
- Lower air emissions
- New transmission needed – new generation normally did not site at existing plant locations for permitting reasons
- Concern that cheaper power resulting from competition would reduce the conservation effort

ERCOT's Second Evolution
Retail Competition

- Retail competition mandated in Texas by the 1999 Legislature - beginning in 2001 – along with renewable energy requirements
- Independent Reliability Authority to oversee reliability, equal access, retail and wholesale market mechanics and energy accounting-ERCOT
- Utilities required to separate their wires activities (transmission and distribution) from their generation and marketing activity
- Municipals and Cooperative utilities exempt from retail competition
- Retail competition began in mid July, 2001 -5.5 Million eligible customers

As of August 7, 2003:

- 1,005,646 customer switches at existing locations
  - 10% of Residential, 13% of Commercial and 50% of Industrial - cust.
  - 13% of Residential, 36% of Commercial and 60% of Industrial - load
- 2,671,262 customer choices at a new location – move in's

Effects Of
Retail Competition

- Renewable energy and credit program mandated as part of retail
- Non-retail competitive areas forced to keep rates low to avoid pressure for retail competition in their area
- Retail competitors forced to keep prices low due to the need to be competitive

Overall:

- Older, less efficient generation units being shut down
- Generation choices cost based, not reliability based
- Transmission use patterns changed once again

Environmental:

- Significant increases in wind generation
- Greater fuel efficiency and less emissions
- More transmission needed

New Reliability Need
RMR

Some of the older, less efficient generation being shut down for economic reasons is still needed for reliability purposes

- New efficient generation not built in some areas where old generation is needed to prevent transmission problems
  - Overload
  - Low voltage
- Old generators must be signed to Reliability Must Run (RMR) contracts whereby their service can be extende
- Negative environmental effect – emissions still occur
- Long lead time fixes required in many cases

Standard Market Design
The "SMD" Words

- Proposed by FERC – what is it – more standardized competitive electric markets across the USA
- Why was it proposed – to promote competition and lower the cost of electricity
- Status
  - Occurring in some areas of the country
  - Many other areas do not want it because they are concerned it will raise prices, they are afraid of competition or concerned about reliability
- Environmental effect – potential for same effects as in ERCOT

Challenges/Opportunities
Wind Energy

- 1,000+ MW of new wind energy in ERCOT in the past 1 ½ years
- Potential for 13,000 MW more
- Barrier – not enough transmission exists out of windy areas – current wind generation is being curtailed during wind periods in some areas
  - Transmission system certainly cannot support 13,000 MW more
- Just beginning to gain knowledge of operational effects of wind
- ERCOT sponsored a project to develop better wind models for transmission planning studies – high interest by others
- Wind energy does not peak in the summer or winter when electric peaks occur – but it does reduce overall fossil fuel use and emissions
- The electric utility industry needs to accommodate wind generation and build the needed transmission

Old Generation In Non-attainment Areas

Many non-attainment areas are dependent on local electric generation just to keep the lights on

- Impossible to add enough transmission to fix the problem
- Local generation is old – inefficient and high emissions
- New generation could meet the requirements with less fuel and much lower emissions
- New generations will not be built if emission standards are subject to continual revision
  - Too much risk for the generation companies
  - Lenders will not finance
- The old generators must run or load will be shut off
- Emission lock ins will improve air quality and allow load to be served

Fuel And Fuel Pricing

- Just as the industry completes many thousands of MW of clean, efficient gas fire generation the "gas bubble" appears to be gone
- New gas production is not meeting the new demand
- Gas prices are significantly higher than two years ago
- One ERCOT generator is considering a coal plant
- The "N word" (nuclear) is beginning to be heard again in the industry – much lower green house gases emitted
- Fuel diversity is good from a reliability standpoint

So, What Is The Message?

- The future of the electric utility industry is changing – slowly – will continue to have many different faces for years or longer – SMD will not occur overnight
- The industry faces many challenges
- Competition and open access HAS helped the environment by directly and indirectly promoting cleaner generation resources
- More renewable energy is important
- New transmission lines will help the environment – especially that needed for new generation and the wind farms – equal access to those lines is important to encourage new development of cleaner resources
- Industry and the regulators CAN and MUST work together to further help the environment – non-attainment areas are a great example