



Long-Term Study Scenario Development Discussion

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Background

- ERCOT completes an assessment of the long-term transmission and generation needs of the ERCOT interconnection every even-numbered year to comply with PURA requirement (39.904[k])
- In August 2009, U.S. Department of Energy issued requests for proposals for interconnection-wide studies of long-term transmission needs. Total grant funding available was \$60 million for the three interconnections.
- ERCOT applied for grant funding in September 2009. ERCOT proposed to use DOE funding to supplement the existing long-term planning process. ERCOT's application included the existing long-term transmission analysis effort as an in-kind contribution.
- An award to ERCOT was announced in December 2009. The total funding provided by the DOE to ERCOT is \$3.5 million.

DOE Grant funding will allow ERCOT to enhance the existing long-term planning process. Specific changes are:

- Increased participation from regulatory, policy-maker, and NGO stakeholders
- Evaluation of a wider range of future scenarios
- More detailed analysis of likely market resource development for each scenario
- Operational analysis of system reliability needs with high levels of intermittent generation
- Development of long-term (20-year) transmission framework for ERCOT grid

Stakeholder/Policy Input

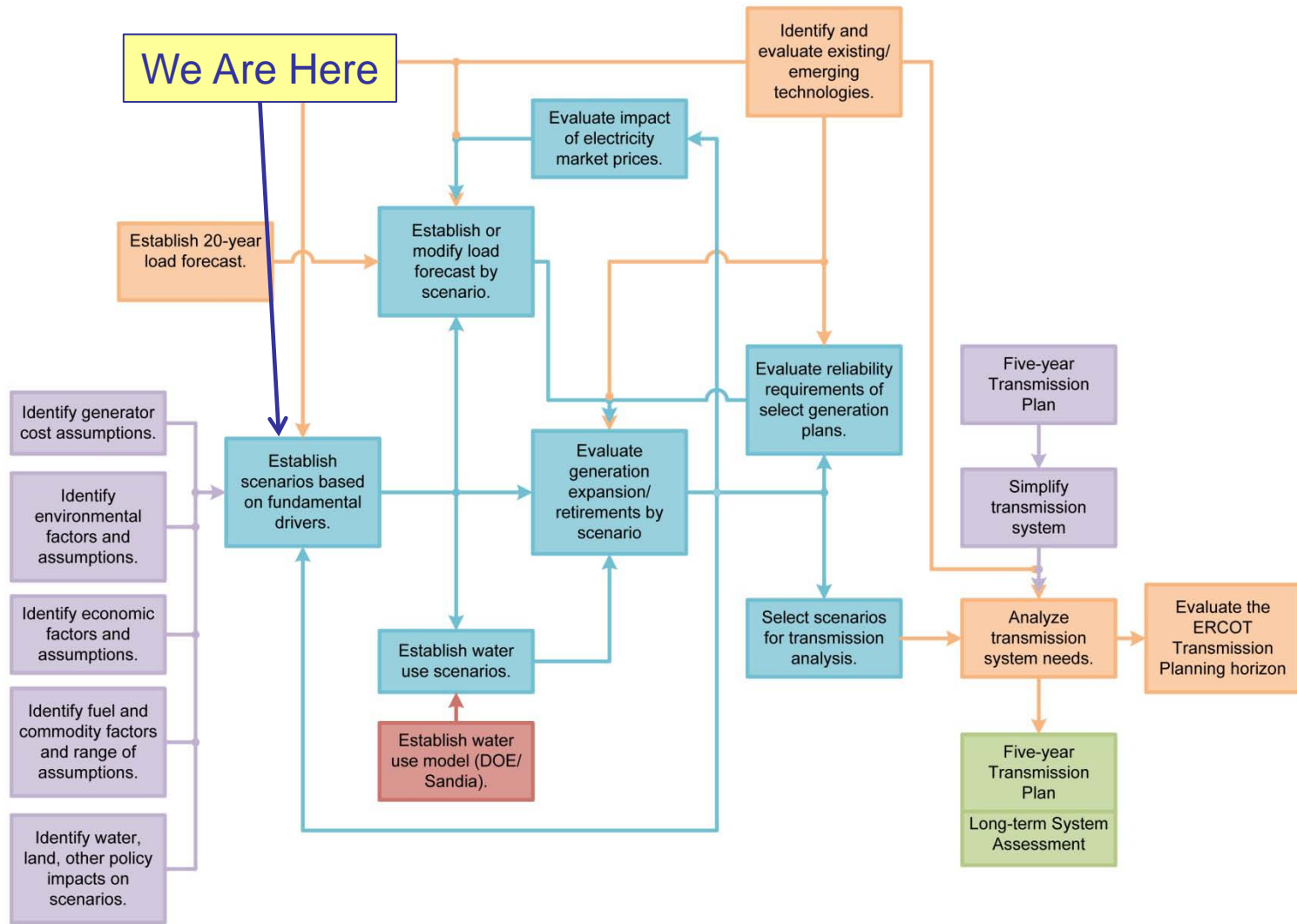
- Significant DOE emphasis on increasing participation in the study development by State regulatory staff, policy-makers, and NGOs
- Build on existing process of stakeholder participation by establishing an Regional Planning Group (RPG)-based Task Force to focus on this study
 - Continued participation by traditional planning stakeholders
 - Enhanced participation by representatives of state government (Governor's office, PUCT, TCEQ, SECO, RRC, TWDB, ...)
 - Facilitated participation by NGOs (environmental, landowner, consumer, etc. groups)

Stakeholder/Policy Input

- The RPG Long-Term Study Task Force (LTSTF) will serve two purposes:
 - Provide input **INTO** planning process on scenarios, assumptions, etc.
 - Provide insight on policymakers' need for information **FROM** planning process
- Intent is to increase relevance of long-range planning to regulators and policy makers

Current Status

The team is currently focusing on scenario development. Once the initial scenarios have been determined, generation expansion analysis can begin.



Scenario Development Process

- ERCOT has been discussing the process of defining scenarios for the long-term study with the Long-Term Study Task Force (LTSTF) since last summer
- A formal process was developed during the last LTSTF meeting on December 2, 2010
- Draft parameters to define scenarios were proposed and reviewed by LTSTF members. Parameters included:
 - Policy Considerations
 - Environmental Regulations, Mandates, and Siting
 - Economic Assumptions
 - Load/Demand Growth Modifiers
 - Load Growth, Customer Behavior
 - Technology Impacts on Generation/Transmission
 - Fuel Prices and Availability
- A straw-man proposal for initial scenarios was sent out to LTSTF members last week.

Long-Term Study Scenarios

- Scenario Development Matrix Strawman
 - 12 draft scenarios are included
 - Ranges of some parameters (low – high) need to be defined
 - Factors that can be included in future scenarios are identified as “future sensitivities”
 - Factors that may affect scenarios but the impacts are not clearly defined *today* are identified as “future considerations”
- This presentation provides a summary of the straw-man scenarios. Current agenda is to briefly review this summary, and then open the spreadsheet and discuss specific scenario details.
- These are only initial proposals. Everything is open for discussion; parameters can be revised and additional scenarios can be proposed. The order of the scenarios (left to right) can be revised as well.

Long-Term Study Scenarios

- **Business As Usual (BAU)**

- Today's market conditions and regulatory policies continue in the future
- Includes:
 - No carbon reduction initiatives
 - None of the proposed EPA regulations
 - Existing renewable generation and energy efficiency mandates
 - Continuation of production tax credits for renewable generation
 - Economic growth and load growth follow historic patterns
 - No significant change to fuel prices or availability

Long-Term Study Scenarios

- **Reduced Natural Gas Supply / High Natural Gas Prices**
 - Reduced availability of natural gas (use of water fracturing for shale gas is eliminated) leads to high prices. Some carbon reduction initiatives are established.
- **High Economic Growth**
 - There is a significant increase in economic growth, leading to a high demand for capital and a high load growth rate. Some carbon reduction initiatives have been established.
- **Nuclear Incentives / Guarantees**
 - Natural gas prices and environmental pressures are high; all current EPA initiatives and significant carbon reduction initiatives are enacted. Enhanced federal load guarantees for nuclear generation are established.

Long-Term Study Scenarios

- **High Renewables / High Economic Growth**

- There is a significant increase in economic growth, leading to a high demand for capital and a high load growth rate. No environmental regulations or mandates are included, but the capital costs for renewable generation are assumed to decrease. Also, additional tax credits are made available for renewable generation.

- **Low CO2 Concerns / High Coal Prices**

- Coal prices are assumed to be higher, with no increase in environmental regulations.

Long-Term Study Scenarios

- **Long-Term Recession**

- An extended recession results in low employment and low demand for capital. There is limited load growth in Texas. Due to reduced national demand, fuel prices are low.
- *How long is this recession? What will it look like when we emerge?*

- **Sustained Drought / High Environmental Regulations**

- Severe water restrictions and availability lead to pressure on all forms of water usage. Environmental regulations are increased significantly. The economy-wide need for new investment leads to an increased cost of capital. High levels of renewable generation are mandated. Coal prices are low due to reduced demand; gas prices are high due to reduced availability (reduced use of water fracturing).

Long-Term Study Scenarios

- **High Clean Energy**
 - Environmental regulations are increased. A federal mandate is enacted for 80% of energy is from clean energy sources
 - Need to define clean energy
- **Carbon Capture and Sequestration (CCS) Implementation**
 - Environmental regulations are increased, and CCS technology (supported with federal loan guarantees) becomes economically viable.

Long-Term Study Scenarios

- **High Petroleum Prices**
 - *Provide input on what this scenario may look like*
- **Retirement of Coal Fleet**
 - Incentives are established to encourage retirement of older coal plants.

Questions?

