



Trip Doggett
President & CEO
ERCOT

Business and Commerce Quarterly Update
January 15, 2014

2013 in Review – Highlights and Accomplishments

ERCOT's key accomplishments in 2013 reflect a shared commitment with stakeholders and policymakers to support electric reliability, market competitiveness and innovation for the future.

In general, we...

- Applied and developed numerous tools, processes and programs to support grid reliability and market efficiency; enhanced employee recruitment, development and retention; and improved overall service to market participants and other stakeholders.
- Completed more than 150 revision requests to support market and grid operations, incorporate new technologies and address ongoing resource adequacy concerns.
- Supported our community in a variety of ways.
- Maintained reliable operations in 2013.

2013 Highlights and Accomplishments (continued)

Working together to strengthen the grid, adapt to changing needs

- Coordinated successful, on-time completion of CREZ projects
- Completed pilots for new Emergency Response Service and Fast-Responding Regulation Service options
- Collaborated with generating companies to enact best known weatherization practices to prepare for peak summer and winter conditions
- Achieved settlement of more than 97 percent of retail load in competitive areas with 15-minute interval data (6.5+ million advanced meters)

Developing market-based tools to support reliability, competition

- Established and began implementing Operating Reserve Demand Curve
- Introduced concepts and began discussions about future Ancillary Services
- Improved Congestion Revenue Rights (CRR) program with implementation of rolling CRR auction and improvements to assignment of appropriate credit risks to specific paths
- Established plan and rules to shorten settlement timeline from seven days to five

2013 Highlights and Accomplishments (continued)

Providing innovative tools to support preparedness

- Tested and improved readiness plans for range of grid situations, from a winter storm to black start restoration
- Redesigned and enhanced mobile app with more real-time information, to improve public awareness
- Released Macomber Map® as open source software with training support and improved interface

Ensuring accountability while preparing for the future

- Supported development of five-year comprehensive strategic plan by Board of Directors
- Achieved favorable audit results for 2012 financials, SSAE16, NERC CIP and an independent review of internal audit practices
- Realized at least \$4.4 million in cost savings through vendor negotiations and other actions while continuing to identify opportunities to streamline projects and processes

2013 Highlights and Accomplishments (continued)

Supporting our neighbors and preparing for a brighter future

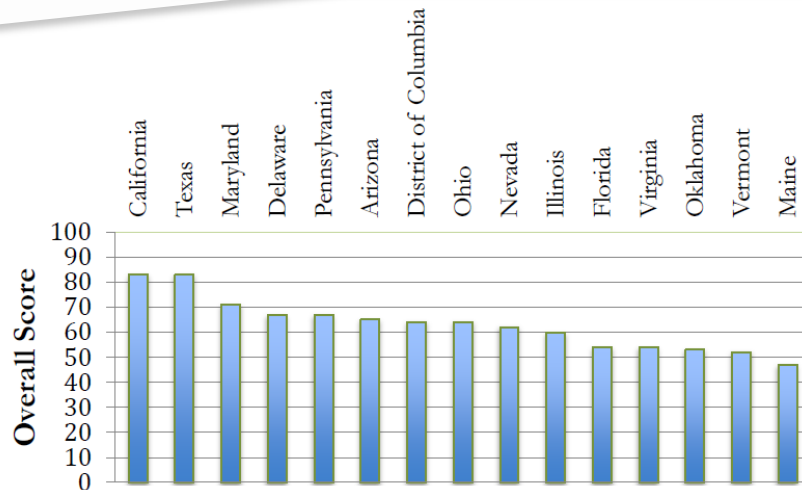
- Received recognition from the State Board of Education and Texas Education Agency with 2013 Employers for Education Excellence Award for effective mentoring and other educational partnership programs with Taylor ISD
- Donated \$16,500 to United Way of Williamson County through employees' first annual giving campaign
- Sent four World War II veterans to Washington, D.C., through Honor Flight Austin
- Provided meals, financial donations, holiday gifts, blood donations and other support to organizations serving children, the elderly and others in need



Grid Modernization Index (GMI)



- Texas and California tied for #1 ranking (83 of 100 points) based on grid modernization policies and activities
- GridWise Alliance and Smart Grid Policy Center studied 41 states and District of Columbia



Highest-ranking states typically:

- Belong to Regional Transmission Organization (RTO) or Independent System Operator (ISO, such as ERCOT)
- Have Renewable Portfolio Standards
- Have higher scores for cyber-security and data privacy
- Have residential/commercial smart meters, top 10 = 60% or more

Current Records

Peak Demand Record: 68,305 megawatts

- 68,305 megawatts (MW), August 3, 2011
 - 4 percent increase over 2010 previous record – 65,776 MW

Weekend Record

- 65,159 MW, Sunday, August 28, 2011
 - 5 percent increase over 2010 previous record – 62,320 MW

Winter Peak Record

- 57,277 MW (January 7, 2014)
 - 12 MW over 2011 previous record – 57,265 MW

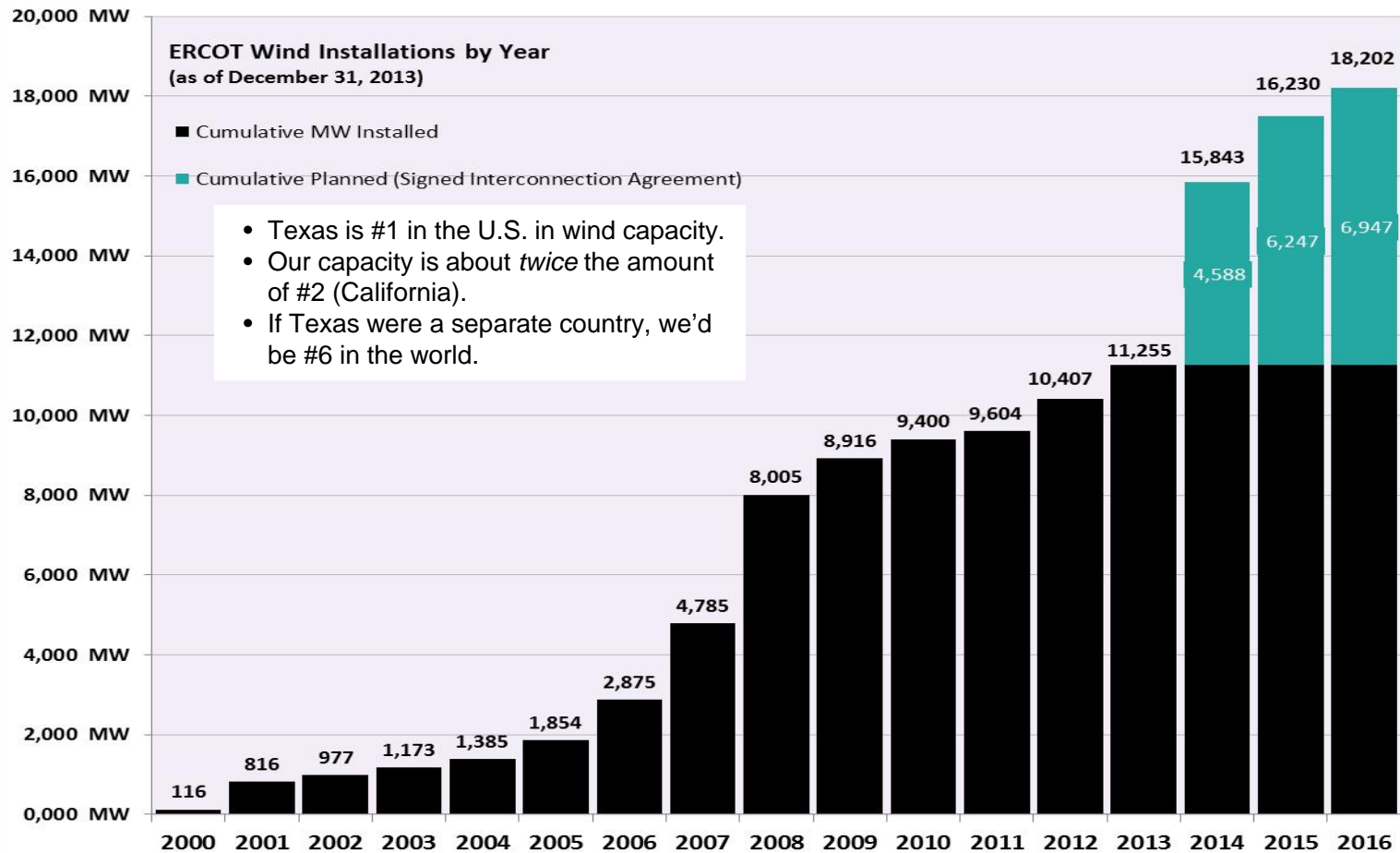
Wind Record

- A new wind record of 9674 MW occurred on May 02, 2013 at 4:30 pm
 - Non-Coastal Wind = 8,116 MW
 - Coastal Wind = 1,558 MW
 - Wind was supplying 28.05% of the 34,493 MW load
 - Installed Commercial Capacity = 10,570 MW

Summer 2013

- Monthly Peak Demands
 - 64,418 MW on June 27th
 - 64,814 MW on July 31st
 - 67,245 MW on August 7th

Wind Generation – December 2013

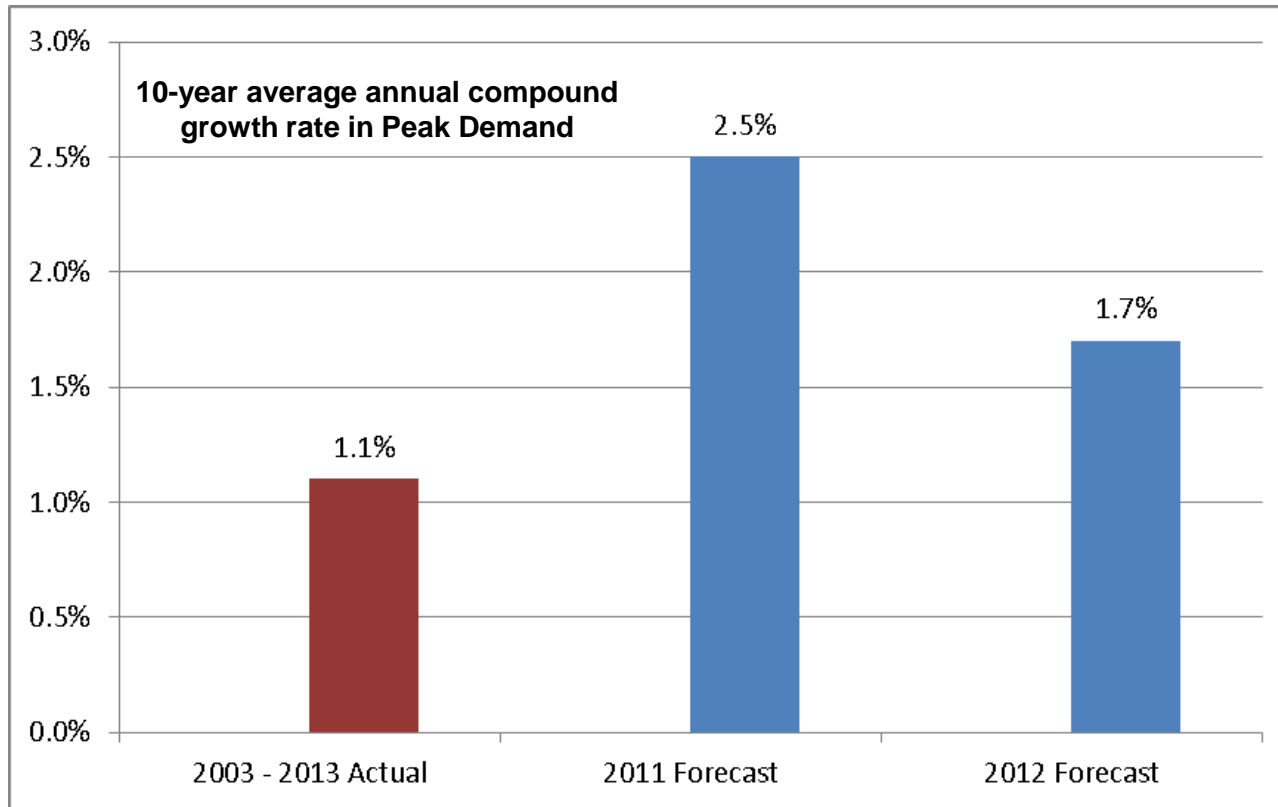


The data presented here is based upon the latest registration data provided to ERCOT by the resource owners and can change without notice. Any capacity changes will be reflected in current and subsequent years' totals. Scheduling delays will also be reflected in the planned projects as that information is received.

This chart reflects planned units in the calendar year of submission rather than installations by peak of year shown.

Economic Growth based Peak Demand Forecast

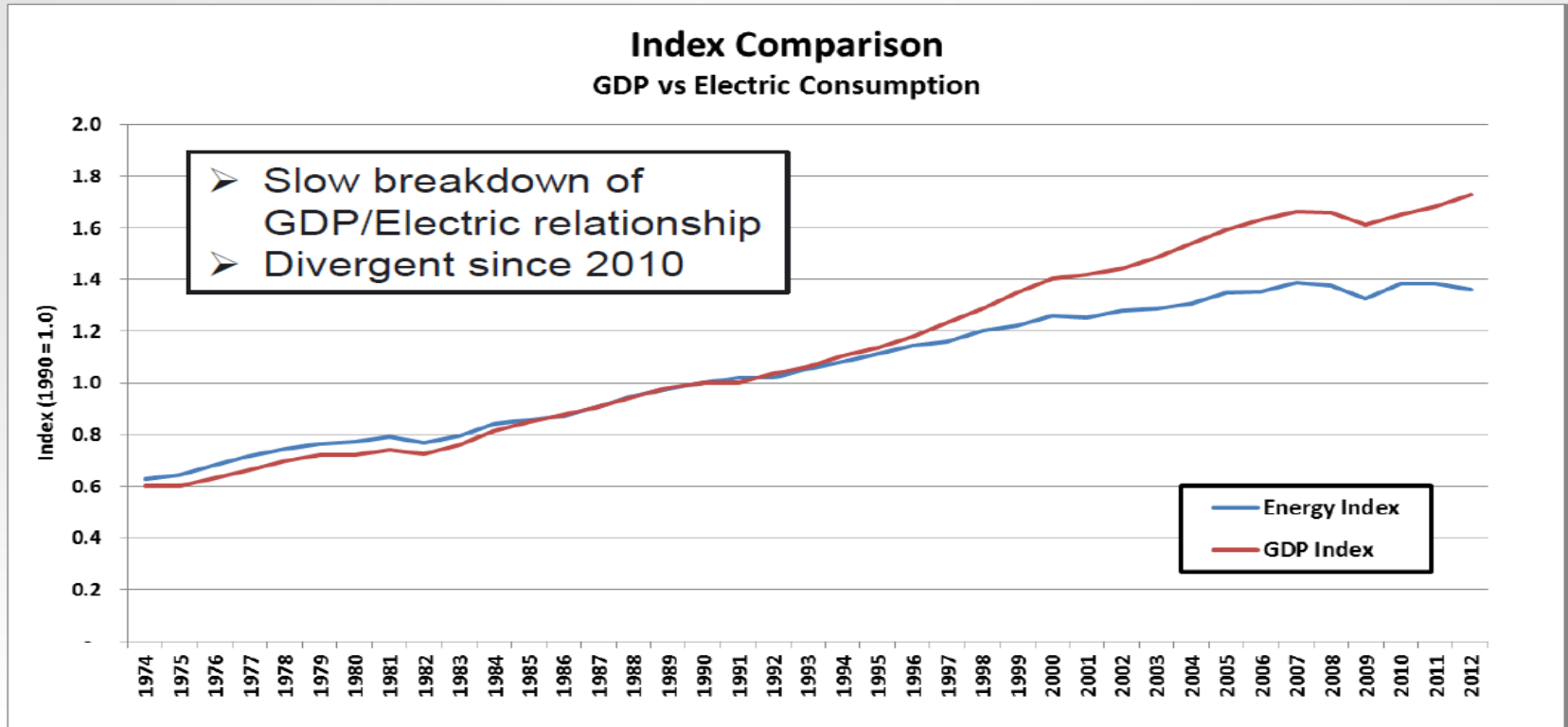
Will Peak Demand grow nearly twice as fast over the next 10 years compared to the prior 10 years?



2011 forecast based on Moody's base scenario (2012 – 2021)
2012 forecast based on Moody's low scenario (2013 – 2022)

National trends

GDP VS. ELECTRIC RELATIONSHIP



Changing Relation Between Load and Nonfarm Employment

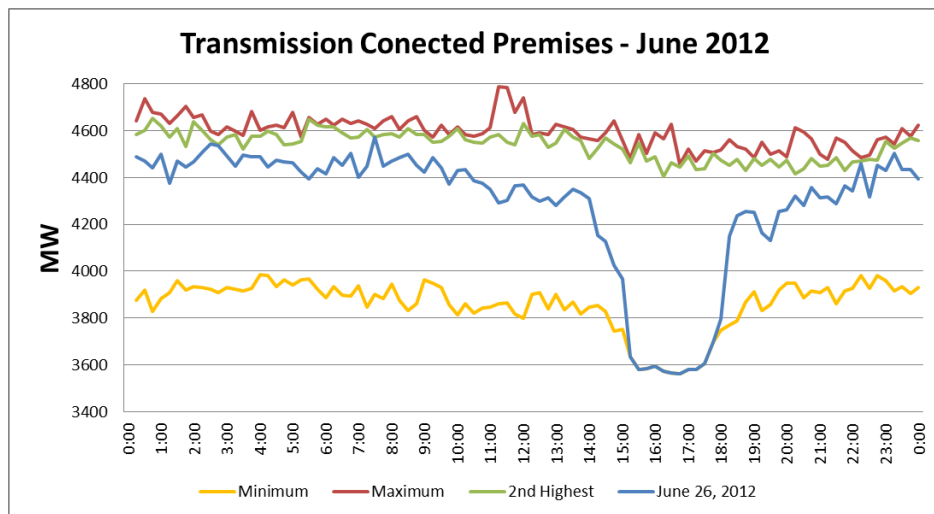
- **Price responsive load**

- Combination of 2011 scarcity pricing and PUC's decision to increase System-Wide Offer Caps is changing behavior:
 - Commercial & industrial loads with prices indexed to the ERCOT wholesale market are increasing their price response flexibility
 - Load-serving entities (LSE) are investing in demand response as insurance against wholesale market exposure
- ERCOT Staff, working with LSEs, are attempting to quantify this behavior; starting with summer 2013 data
- 4 CP impact

- **Energy efficiency upgrades**

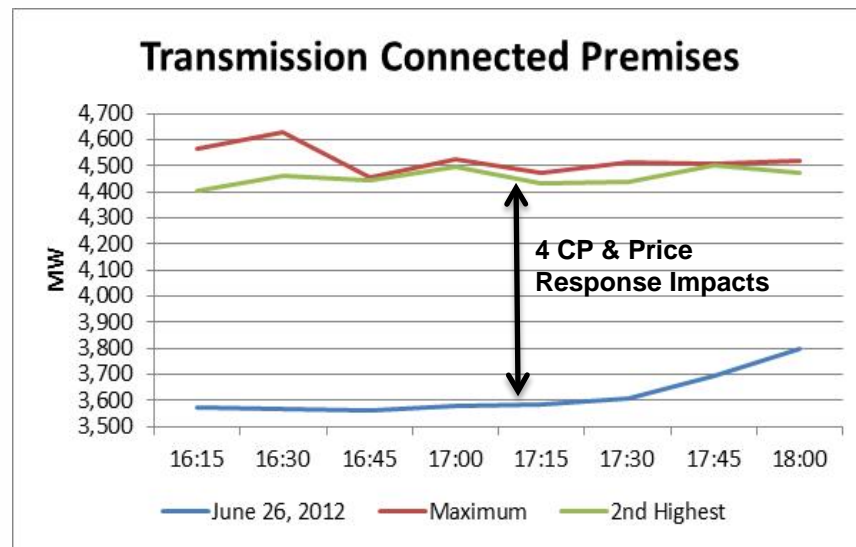
- Energy Star appliances
- Conversions to CFL and LED lighting

2012 Summer Peak - 4 CP & Price Response Impacts (June 26)



- Impacts shown are based on aggregated transmission load values for ~430 premises
- Not estimated based on an analysis of individual premises

- Difference represents the 4 CP & Price Response impacts of ~ 900 MW on an aggregated basis
- Transmission charges based on 4CP usage apply to Munis, Co-ops, and Loads with >700 kW of peak demand in retail choice areas.
- This data is an example of observed 4CP and price response impacts.



Status of the Load Forecasting Review Process

- ERCOT staff has developed a methodology for the load forecast that is different from what has been used in recent years.
- The proposed methodology represents a significant change, and we want to ensure it has been thoroughly reviewed by the Board and stakeholders before it is incorporated into our next Capacity, Demand and Reserves (CDR) Report.
- Joint review by the Reliability & Operations Subcommittee (ROS) and Wholesale Market Subcommittee (WMS) of the Technical Advisory Committee (TAC).
- ERCOT has retained an independent consultant to review the methodology.
- ERCOT expects to have a revised load forecast by mid-to-late January 2014, depending on input received.
- Following board discussions on the revised load forecast, ERCOT will decide when to issue the updated CDR report.

2013 Completed Actions

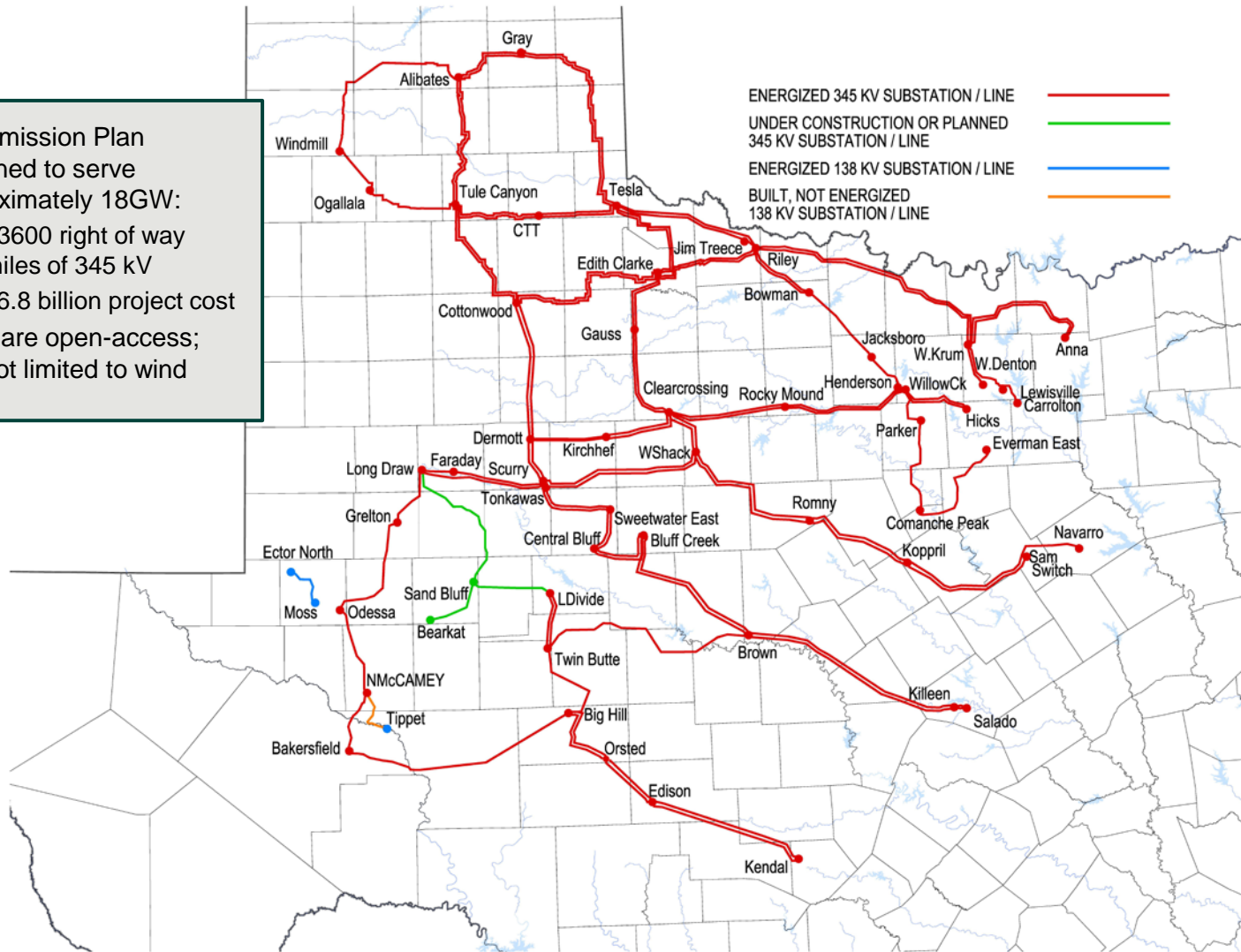
- **NPRR 520 – (Real-Time Mitigation Rules and Creation of a Real-Time Constraint Competitiveness) implemented in the summer of 2013 to address over-mitigation**
- **30-minute Emergency Response Service (ERS) pilot and Weather Sensitive ERS pilot were completed and corresponding NPRRs were approved by the BOD**
- **TSPs with guidance from the Voltage Reduction Task Force completed voltage reduction testing in the summer of 2013**
- **Value of Lost Load (VOLL) Literature Review and Macro Economic Analysis**
- **NPRR 568 – (RT Reserve Price Adder Based on ORDC) and NPRR 555 – (Loads in SCED) were approved by the BOD**
- **Scoping and Impact Analysis for Real-Time Co-optimization**

What's Around the Corner?

- **NPRR 568 – (RT Reserve Price Adder Based on ORDC) to be implemented by June 2014**
- **NPRR 555 – (Loads in SCED) targeted to be implemented by June 2014**
- **30 minute ERS and Weather Sensitive ERS to be procured starting in early 2014**
- **The Voltage Reduction Task Force final report on the Summer 2013 voltage reduction testing**
- **Calculation of retail price/demand response using data collected from Load Serving Entities**

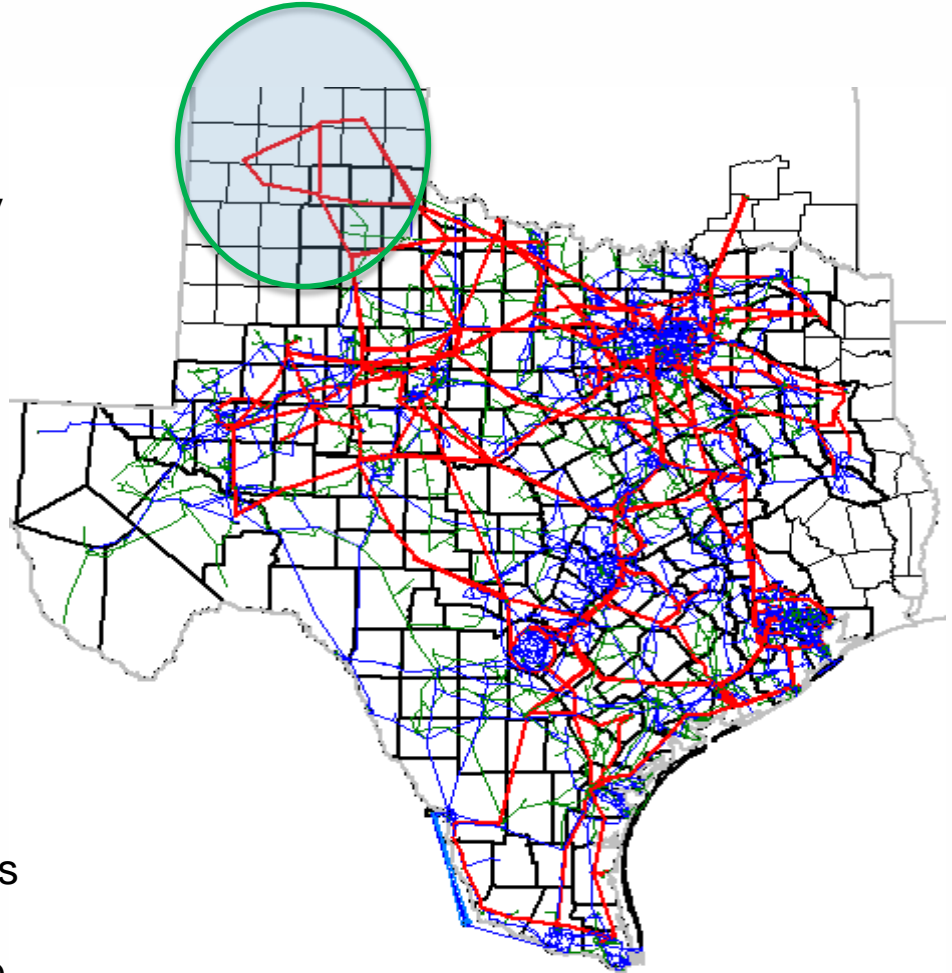
CREZ Transmission Update – January 13, 2014

- Transmission Plan designed to serve approximately 18GW:
 - ~3600 right of way miles of 345 kV
 - \$6.8 billion project cost
- Lines are open-access; use not limited to wind

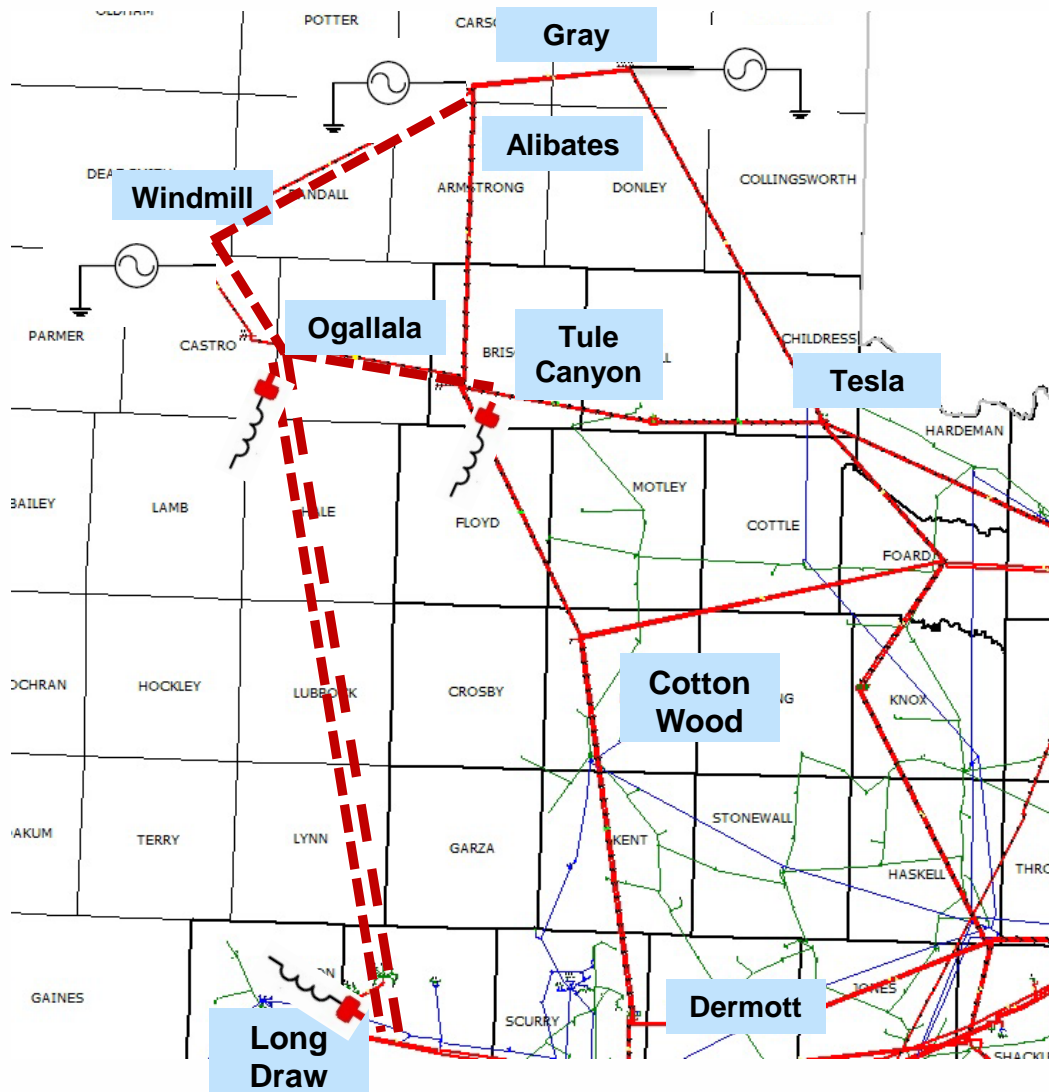


ERCOT Panhandle Grid Characteristics

- Minimal to no nearby synchronous generation
- No local load
- These conditions lead to voltage stability and grid strength challenges
- Current wind generation development:
 - >3.4 GW of wind capacity in the Panhandle with signed interconnection agreements
 - >7.7 GW of additional wind generation in the interconnection study process
- Long Term Studies show a continued expansion of wind resources in the Panhandle under a range of future outcomes.
- CREZ Reactive Study Recommendations were designed to accommodate 2,400 MW of wind generation in the Panhandle CREZ regions



Panhandle Renewable Energy Zones (PREZ) Study



An initial set of transmission upgrades includes:

- New 345-kV circuits on existing towers from Alibates to Windmill, Windmill to Ogallala, and Ogallala to Tule Canyon (towers were designed to accommodate these additional circuits).
- Synchronous condenser at the Windmill substation

A potential future set of upgrades includes:

- New 345-kV circuit from Ogallala to Long Draw
- Additional synchronous condensers at Windmill, Alibates, and Gray substations

Eagle Ford and Cline Shale

- Oil and natural gas related demand has caused a significant amount of load growth in west Texas and south Texas
- Six of the top ten transmission constraints on the ERCOT System in 2013 were related to serving the increased demand in west Texas
- A significant number of transmission projects have been implemented in west Texas within the past two years, and more than 60 are planned over the next four years to meet the oil and natural gas related needs
- More than \$330 million in transmission projects have been approved by the ERCOT Regional Planning Group since 2012 in order to meet Eagle Ford Shale load growth in south Texas (Expected in-service – 2013 through 2016)

Houston Import Project

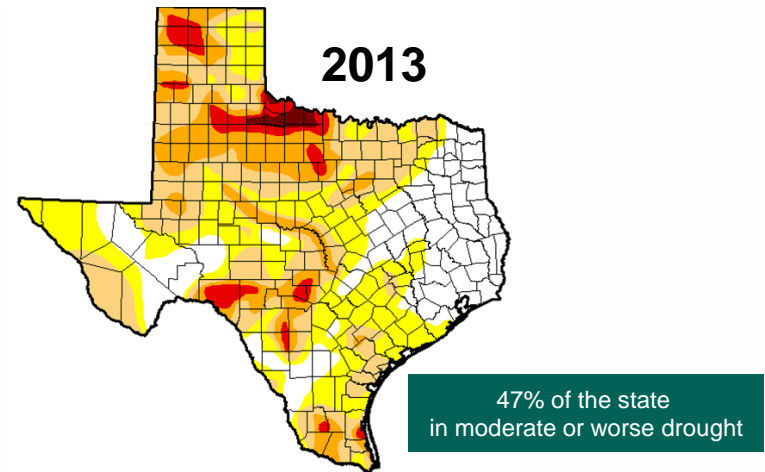
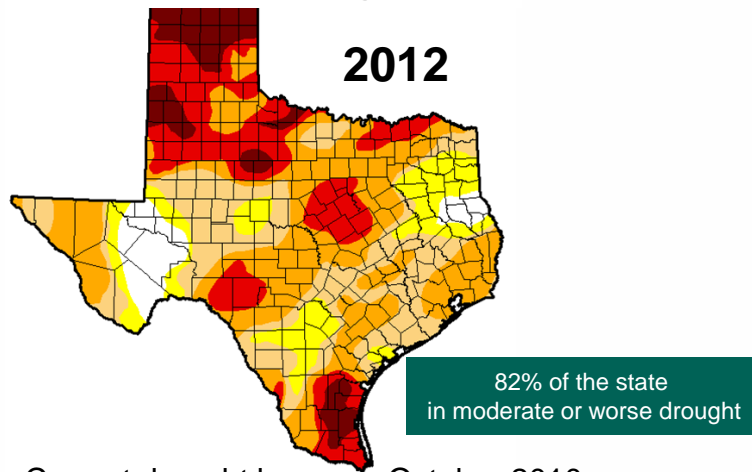
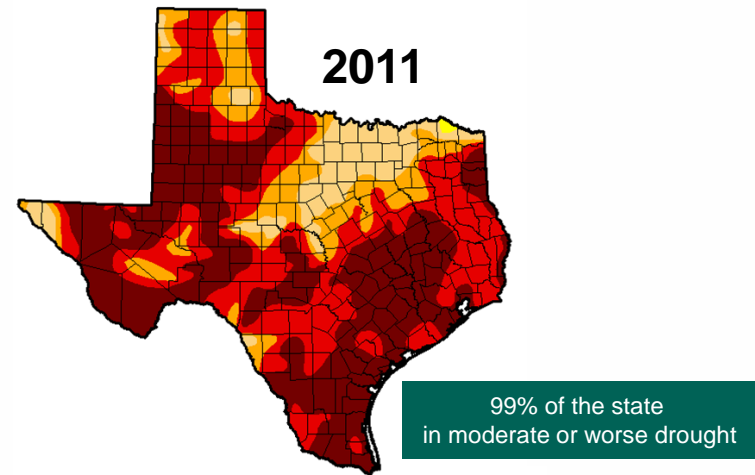
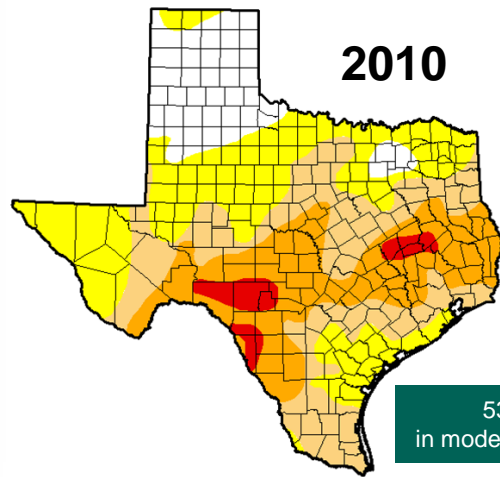
ERCOT conducted an independent review of the proposed set of projects to increase the import capability into the Houston area

- ERCOT determined that there will be a reliability need for additional import capacity into Houston by 2018, based on planning studies that indicate:
 - Thermal overloads of the import paths from North to Houston
 - Low voltages around Bobville, Rothwood, Tomball, and Kuykendahl
 - Additional reliability criteria violations (G-1+N-1)
- ERCOT reviewed 19 transmission alternatives
 - ERCOT conducted reliability analyses (steady-state N-1 contingency analysis; G-1 + N-1 analysis; voltage stability; NERC Category C and D analysis; and generator retirement analysis)
 - ERCOT assessed the long-term benefits from projects that met the reliability criteria and used a cost/benefit analysis to rank the alternatives
 - The preferred alternative is expected to be presented to the BOD in Feb 2014

January 6, 2014 Emergency Operations

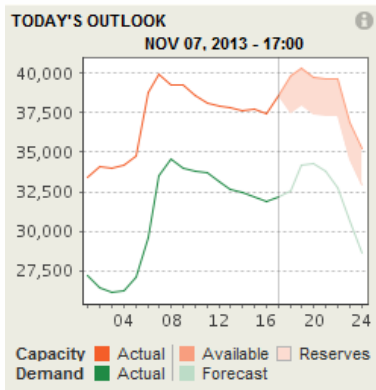
- On the morning of January 6, 2014, ERCOT entered into emergency operations due to the loss or derating of an abnormally-high number of generating units.
- ERCOT declared EEA1 at 6:52am and EEA2 at 7:01am. ERCOT moved from EEA2 to EEA1 at 7:51am.
- EEA was terminated at 9:12am.
- ERCOT did not enter EEA3 during this event and did not shed firm load.
- Based on preliminary information, only three of the unit trips during this event were directly related to winterization issues. However, it is possible that a number of the other unit trips/deratings were indirectly due to weather.
- ERCOT has already had an on-site re-visit with one of the resources that tripped due to weather issues to review their weatherization plans. Other visits are already scheduled.

Comparing Early-December Drought Conditions



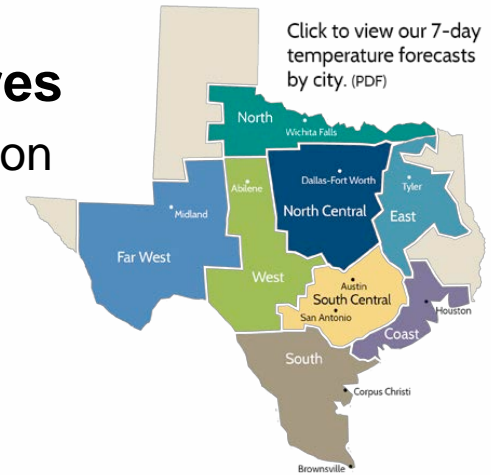
- Current drought began in October 2010.
- General improvement from a year ago, though nearly half the state is still experiencing moderate or worse drought.
- Lack of El Niño combined with AMO+/PDO- continues to support drought.

Improving communications with consumers



ERCOT website – added features

- **Today's Outlook:** Hourly generation and load information
- **Weather page:** Daily, seasonal



Social media – join us!

- Twitter: 4,780 followers
- Facebook: 1,285 friends
- LinkedIn: 2,092 followers

ERCOT Energy Saver mobile app – upgraded

- System conditions – hourly and real-time updates
- Wholesale pricing information – Hubs and Load Zones
- Other improved features and information sharing

