



## When Altruism Begins at Home: It Takes a Community of Energy Users

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## Core Philosophy:

"All organizations are perfectly aligned to get the results they get."

Arthur W. Jones

Shouldn't the same be true for all power grids?

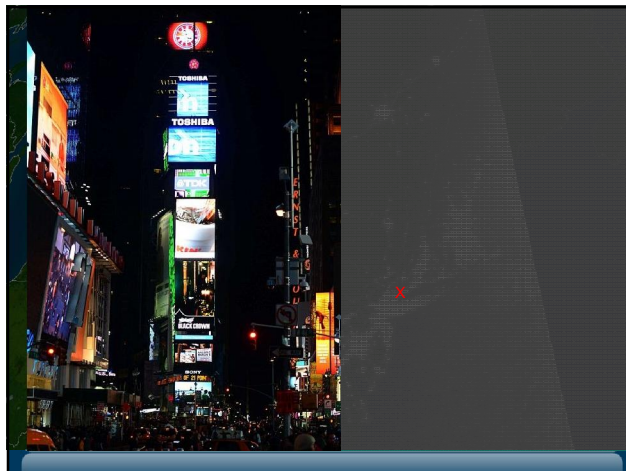
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## The Bulk Power System

- Presidential Policy Directive 21: Energy and communications infrastructure especially critical because of their enabling functions across all critical infrastructure areas
- DOE: "A resilient electric grid... is arguably the most complex and critical infrastructure."

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### Situation Awareness



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### ERCOT Overview

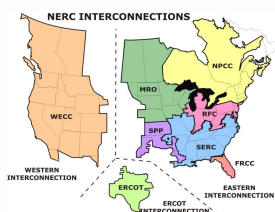
#### RESPONSIBILITIES

The Texas Legislature restructured the Texas electric market in 1999 by unbundling the investor-owned utilities and creating retail customer choice in those areas, and assigned ERCOT four primary responsibilities:

- **System Reliability** - Ensure reliability and adequacy of regional electric network
- **Open Access to Transmission** - Ensure nondiscriminatory access to transmission/distribution systems for all buyers and sellers
- **Competitive Retail Market** - Facilitate retail registration and switching
- **Competitive Wholesale Market** - Ensure accurate accounting for electricity production and delivery among the generators and wholesale buyers and sellers in the region

#### QUICK FACTS

- 75% of Texas land, 90% of Texas load
- More than 43,000 miles of transmission lines
- 550+ generation units
- 68,305 MW peak demand (set August 3, 2011)
- Most wind generation of any state.
- 5<sup>th</sup> largest wind producer in the world.
- > 40% of the grid has run on wind
- > 15,000 MW wind capacity.



ERCOT connections to other grids are limited to five direct current (DC) ties, which allow control over flow of electricity

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### ERCOT Responsibilities

System Reliability

Open Access to Transmission

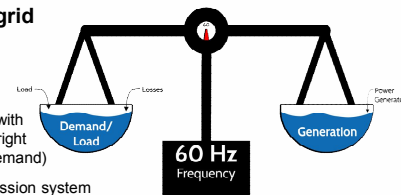
Competitive Retail Market

Competitive Wholesale Market

#### ERCOT's primary responsibility is grid reliability.

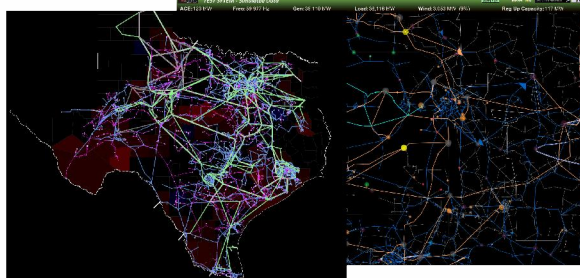
This is accomplished by:

- Matching generation with demand (moving the right generators to meet demand)
- Operating the transmission system within established limits
- Facilitating competitive markets



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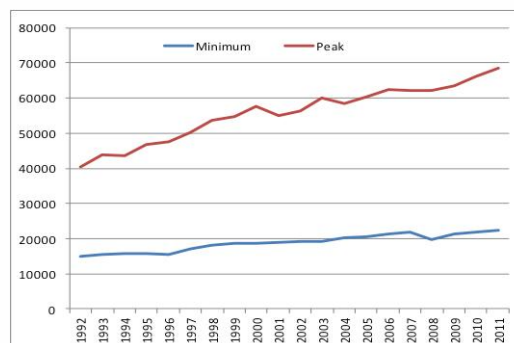
## Macomber Map



Macomber Map now available to the public as an open source application: <http://MacomberMap.codeplex.com>

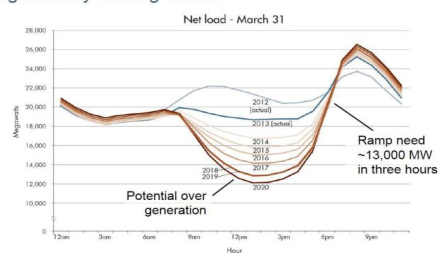
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## On-peak vs. off-peak demand



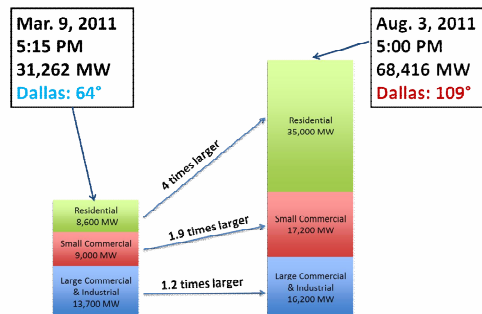
## “Duck Curve”

Non-summer months — Net load pattern changes significantly starting in 2014

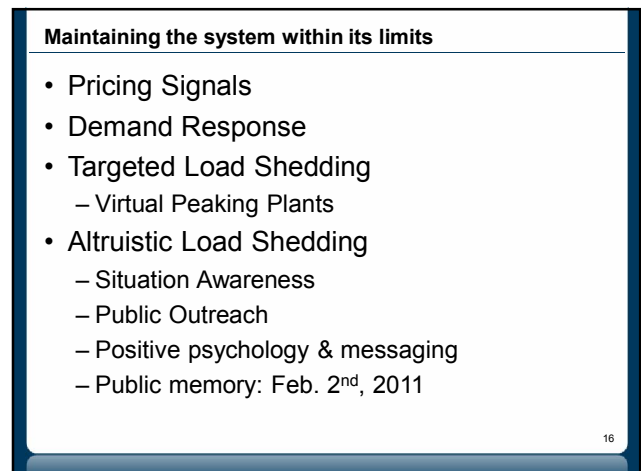
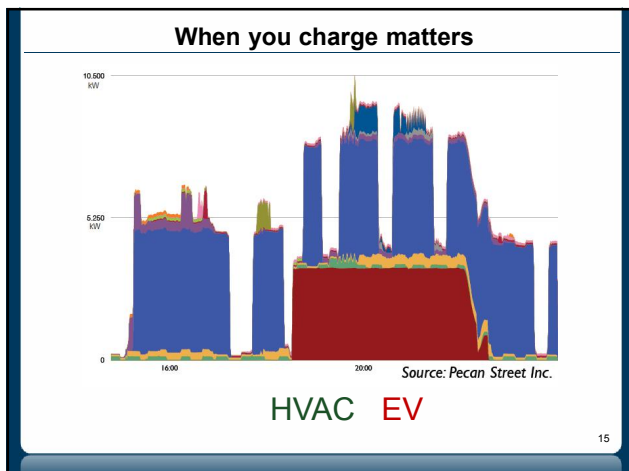
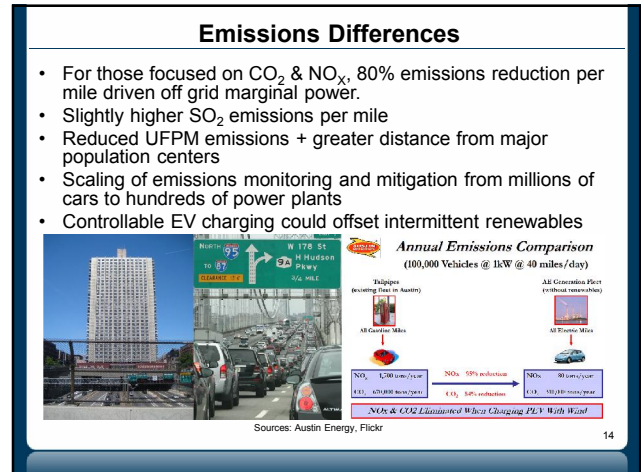
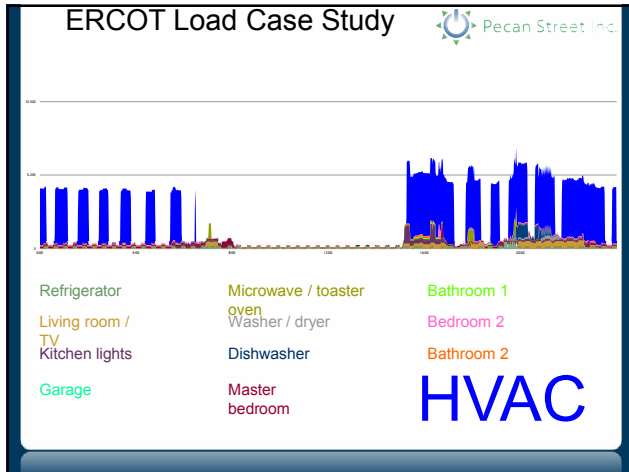


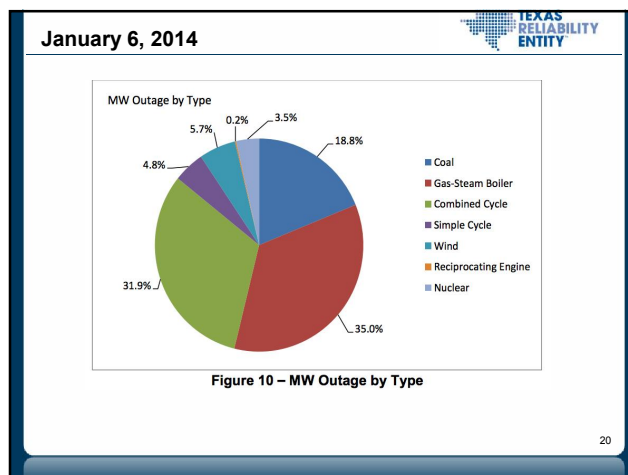
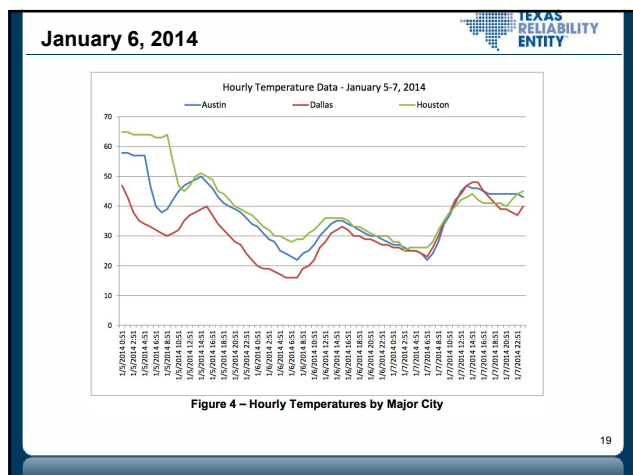
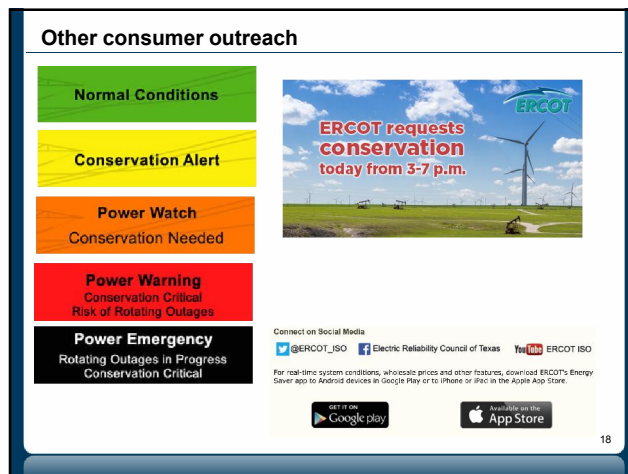
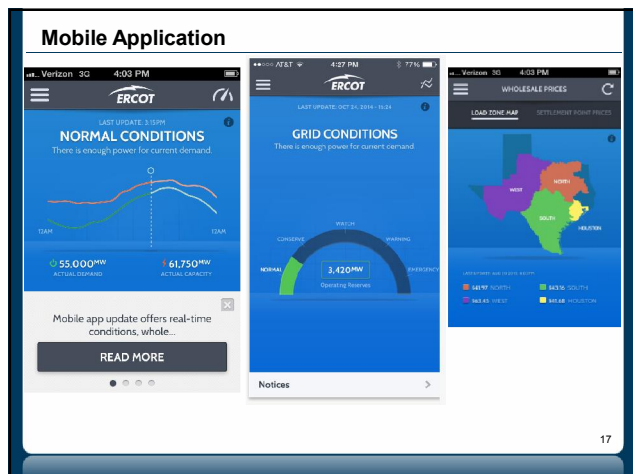
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## ERCOT Load Case Study



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- January 6, 2014**

## January 6, 2014

### News Release

January 07, 2014

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### Demand for power in ERCOT region hits new winter peak

*Conservation Alert discontinued*

"We appreciate the consumer response to our conservation request yesterday, as well as the steps generation and transmission companies in the ERCOT region have taken to prepare for today's power needs," said Dan Woodfin, director of System Operations.

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## Staying Focused...



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