

# State of the Wind: Texas wind economic impacts

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# Global Perspective

- China – 63,000 MW
- **USA – 50,000 MW**
- Germany – 30,000 MW
- Spain – 22,000 MW
- India – 17,000 MW
- **Texas – 12,000 MW**
- France – 6,800 MW
- Italy – 6,750 MW
- United Kingdom – 6,500 MW
- Canada – 5,265 MW
- Portugal – 4,000 MW
- Denmark – 3,900 MW
- **Nolan County – 2,500 MW**
- Australia – 2,250
- South America – 1,844 MW
- Mexico – 875 MW
- **Nebraska – 450 MW**



# USA Wind Energy – Top States

- Texas – 12,000 MW
- Iowa – 4,524 MW
- California – 4,425 MW
- Illinois – 3,055 MW
- Minnesota – 2,718 MW
- Washington – 2,573 MW
- Oregon – 2,513 MW
- *Nolan County – 2,500 MW*

# Texas – wind central

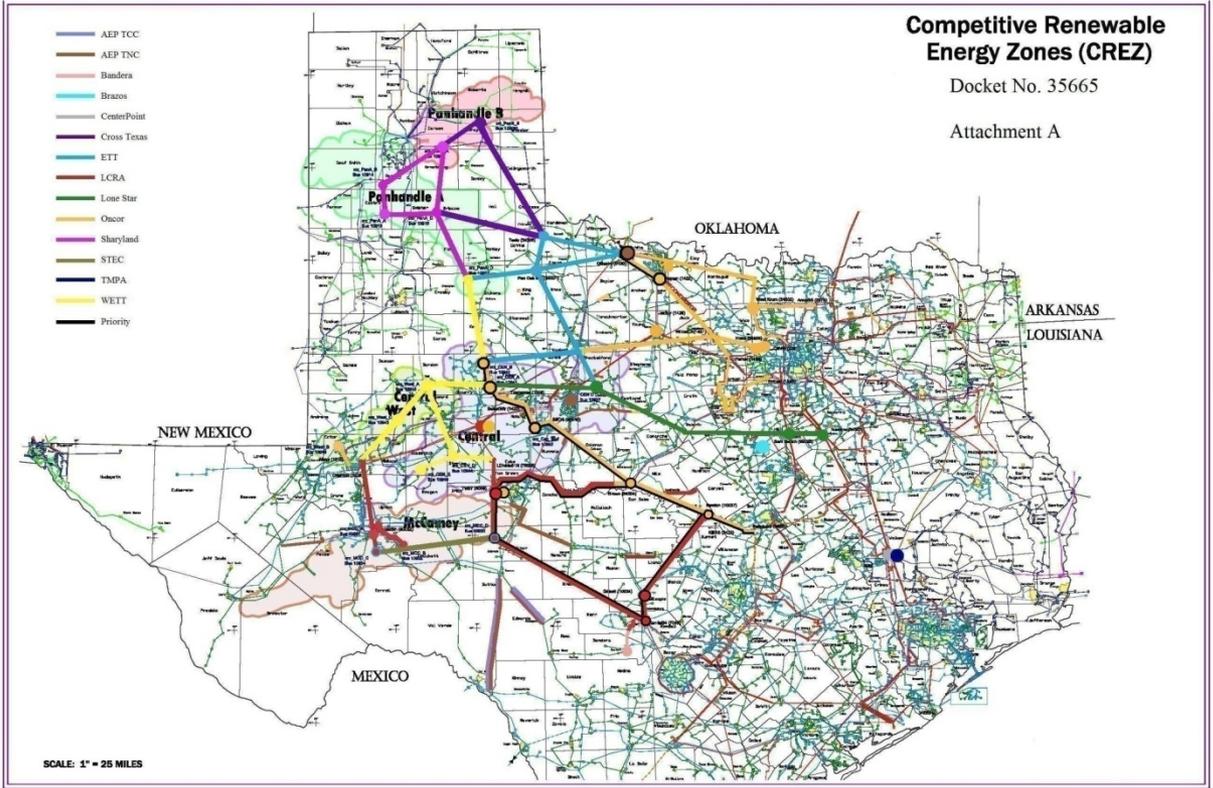
- Using Sweetwater as center point:
- Within 75 miles: 25% of USA installed wind
- Within 250 miles: 33% of USA installed wind
- Within 500 miles: 40% of USA installed wind
- Midway USA: halfway between Atlantic & Pacific
- Halfway between Mexico's Pacific ports & central Canadian cities
- Texas ports – Gateway to USA wind corridor



# Texas turbine types – Panhandle to Gulf



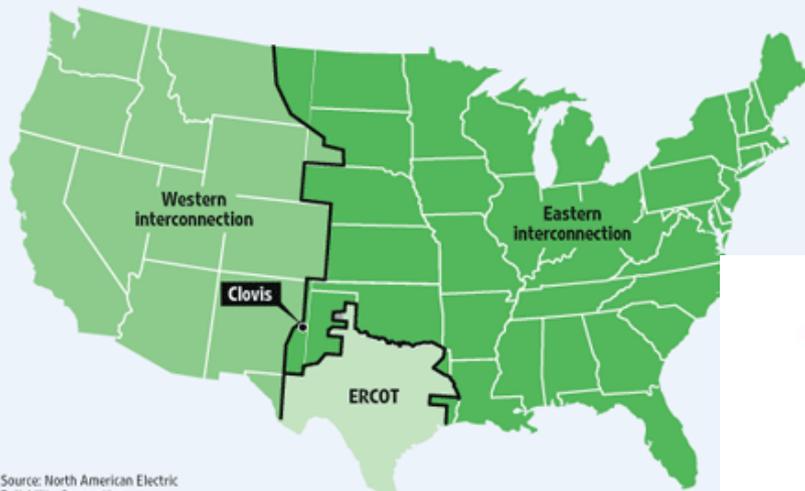
- Mitsubishi 1.0 MW
- GE Wind 1.5 MW
- Vestas 1.8 MW
- Gamesa 2.0 MW
- DeWind 2.0 MW
- Suzlon 2.1 MW
- Siemens 2.3 MW
- Mitsubishi 2.4 MW
- Clipper 2.5 MW
- Nordex 2.5 MW
- Vestas 3.0 MW



# Tres Amigas Grid Interconnect

## Current Exchange

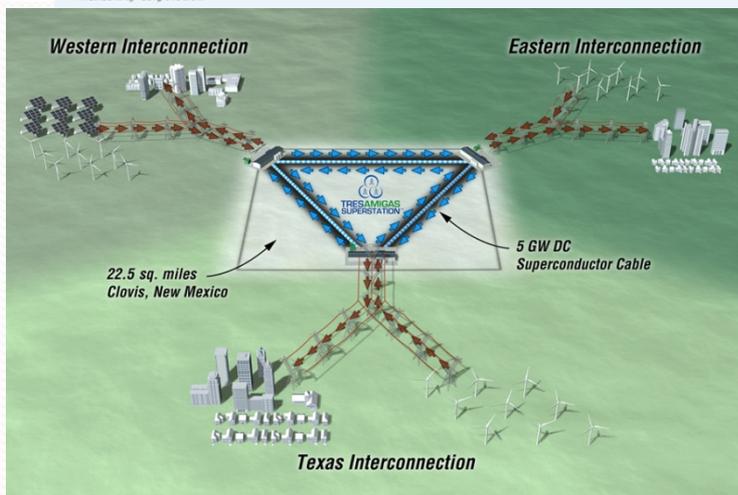
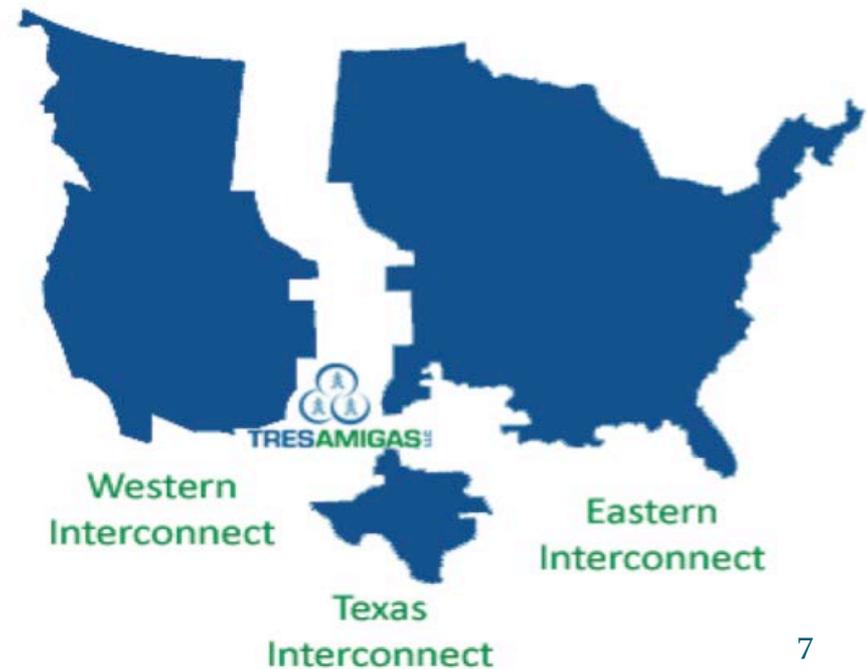
Specialists propose a "super-substation" near Clovis, N.M., that would be capable of moving electricity among the nation's three electric grids.



Source: North American Electric Reliability Corporation



## NATIONAL POWER GRIDS



# Texas wind industrial clusters



- Ports of Houston, Corpus Christi, Freeport, Beaumont, Brownsville
- Tower manufacturing @ Abilene, San Angelo, Dallas, Kaufman
- Additional steel components at Brownwood, El Paso, Nacogdoches, Coleman, Amarillo
- Turbine manufacturing @ Round Rock, Amarillo
- Research & testing – Houston & Corpus Christi

# Texas community cooperation

- Critical mass
- Development expansion
- Service region dispatch
- 100-1000-10,000-100,000
- Railroads
- Interstates
- Industrial clusters
- Gateway to USA wind region



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# Regional Project Benefits



- Landowner revenue
- Tax revenue
- Employment
- Small business
- Industry



# Landowner income

- Revenue per turbine
  - Size of turbine
  - Wind consistency
  - Year of lease
  - Contract electricity price
- Revenue for other project facilities
  - Roads
  - Offices
  - Substations
- Benefits to community





# Tax Revenue

- Counties
- Hospital districts
- School districts
  - Redistribution to other Texas schools
  - Local infrastructure
- Sales taxes in cities
  - Including industrial assets
- City property taxes from new businesses, homes, industry

# Employment

- Construction
- Wind project O&M
- Industry
- Ancillary businesses
- College & university training & education
- Wind operations centers
- Turbine prototypes & testing



# Industry & workforce

- Western Hemisphere's largest & most skilled wind energy workforce
- Leading wind science & technology colleges & universities
- National Institute for Renewable Energy – 2 yr colleges, 4 yr universities, industry, government
- SWEET Center – field prototypes of turbines & wind assessment – TSTC
- Workforce training – Texas Wind Energy Institute – Texas State Technical College & Texas Tech University – K-PhD
- Texas A&M University system, TSTC, community colleges
- Workforce recruitment – [www.GreenCollarVets.org](http://www.GreenCollarVets.org)



## Economic impacts: Nolan County example

- Direct wind jobs: 1,124 in 2008; 1,330 in 2009
- = 20% of total local jobs from 2003
- Annual payroll more than \$45,000,000/yr growing to almost \$60,000,000 in 2009
- Landowner royalties: \$15,000,000+/yr
- Total economic impact: \$400,000,000+/yr
- New local schools construction: \$30,000,000 (2005-2010)
- Wind wages = almost double pre-existing per capita wage
- Local tax base increase from \$0.5 billion to \$2.5 billion since 2000



# Wind company examples – Sweetwater operations

- GE Wind
- Infigen
- NextEra FPL
- AES Wind
- AEP Wind
- E.on
- DeWind
- Blattner
- Availon
- Evans Enterprises



- SecondWind
- Advance Turbine Services
- System 3
- Third Planet Windpower
- Vestas
- Wind Energy Turbine Services
- Hytorc
- Upwind Solutions
- Siemens
- Fastenal



# More wind company examples – Sweetwater

- Crane Service Inc.
- Mitsubishi
- Sun Electric
- Invenergy
- Windkraft Nord WKN
- Wave Wind
- Wind law firms
- Shermco
- Turn Energy Services
- KR Wind
- Transmission construction companies





# TEXAS

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## pro-wind attitude



