Texas Renewable Energy Supply

U.S. Policy
20% Wind Scenario

- Natural gas, 24%
- Coal, 23%
- Renewable energy, 6%
- Petroleum, 39%
- Nuclear, 8%

Biomass Consumption (Million dry tons/year)

<table>
<thead>
<tr>
<th>Biomass Consumption</th>
<th>Million dry tons/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest products industry</td>
<td></td>
</tr>
<tr>
<td>Wood residues</td>
<td>44</td>
</tr>
<tr>
<td>Pulping liquors</td>
<td>52</td>
</tr>
<tr>
<td>Urban wood and food &amp; other process residues</td>
<td>35</td>
</tr>
<tr>
<td>Fuelwood (residential/commercial &amp; electric utilities)</td>
<td>35</td>
</tr>
<tr>
<td>Biofuels</td>
<td>18</td>
</tr>
<tr>
<td>Bioproducts</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>190</strong></td>
</tr>
</tbody>
</table>

- Offshore
- Land-based
Wind produces natural kinetic energy, which is converted into commercial electricity through turbines without the production of carbon dioxide.*
Wind in Watts

- **K**ilowatt = 1000 Watts;
  - *Kilowatt x hours of use* measures electrical energy used (i.e. utility bills).

- **M**egawatt = 1000 Kilowatts;
  - Wind Turbines are measure in MW output

- **G**igawatt = 1000 Megawatts, or 1 billion watts
  - Texas has 8 GW of Installed Capacity
  - Largest Installed Capacity in the US*
  - 5% of the Worldwide Installed Capacity
Why Texas?

- Land: 150 million acres in open space
  - Shell Windenergy/Luminant in Briscoe County
  - 3 GW Wind Farm, 120 square miles
  - WSJ March 12, 2007
- Private Ownership
- Population: 24 million Texans*
- Wind:
  - States with most wind energy resource
    - #1 North Dakota
    - #2 Texas
    - #3 Kansas
    - #4 South Dakota
    - #5 Montana
- Grid: Electric Reliability Council of Texas “ERCOT”
Electric Reliability Council of Texas

“ERCOT”

- ERCOT operates an electric grid that connects 38,000 miles of transmission lines in Texas.
- Administers open market for electricity to 20 million Texans.
- Regulated by the Texas Public Utility Commission.
Federal Government Policy

- Production Tax Credit ("PTC")
  - PTC provides a $.02 cent Tax Credit per kWh of electricity produced from wind energy facilities, for the first 10 years of production.
- Tax Credit is a powerful tax policy tool.
- Congress passes incrementally.
- American Recovery and Reinvestment Act - 12/31/2012
  - Convertible to a 30% Investment Tax Credit.
State Government Policy

- Senate Bill 7 - 1999
- Texas Renewable Portfolio Standard ("RPS")
  - A Mandate created by the Texas Legislature, which requires electricity providers to generate 2,000 MW of additional renewable energy. (the “RPS Goal”)
  - Each Provider of Electricity is required to obtain new renewable energy capacity based on their market share of energy sales times the RPS Goal.
  - Example: An electricity retailer with 10% of the Texas retail electricity market would be required under the RPS to obtain 200 megawatts of renewable energy capacity (regardless of profit).
- 24 States with RPS
  - American Clean Energy and Security Act of 2009 - 20% RES
State Government Policy

- Senate Bill 7 - 1999
  - Renewable Energy Credits (“RECS”)
    - 1 REC = 1 MW hour of Renewable Energy Production
    - Transmission required to obtain RECS
    - ERCOT administers REC Market
    - Active US Trading Market for RECS: $900 Million in 2010
    - Non Utility Purchasers: Whole Foods, Starbucks, NFL Superbowl, Academy Awards, University of California
    - Statute creates a Commodity & Virtual Economy for Renewable Energy*
- Texas Wind Production Quadrupled as a result of SB 7.
State Government Policy

- Senate Bill 20 - 2005

- Expands RPS Goal to 5,880 MW by 2015 – 10,000 MW by 2025

- Created Competitive Renewable Energy Zones (CREZ)
  - CREZ procedure is a statutory plan to expand transmission infrastructure so wind resources in remote areas of Texas (e.g., Panhandle) could be delivered to Texas urban areas (e.g., D/FW).
  - Pursuant to CREZ, Texas PUC identified 5 CREZ zones, which contain prime wind resources.

<table>
<thead>
<tr>
<th>Wind Zone</th>
<th>Scen. 1</th>
<th>Scen. 2</th>
<th>Scen. 3</th>
<th>Scen. 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panhandle A</td>
<td>1,422</td>
<td>3,191</td>
<td>4,960</td>
<td>6,660</td>
</tr>
<tr>
<td>Panhandle B</td>
<td>1,067</td>
<td>2,393</td>
<td>3,720</td>
<td>0</td>
</tr>
<tr>
<td>Mccamey</td>
<td>829</td>
<td>1,859</td>
<td>2,890</td>
<td>3,190</td>
</tr>
<tr>
<td>Central</td>
<td>1,358</td>
<td>3,047</td>
<td>4,735</td>
<td>5,615</td>
</tr>
<tr>
<td>Central West</td>
<td>474</td>
<td>1,063</td>
<td>1,651</td>
<td>2,051</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12,053</strong></td>
<td><strong>18,456</strong></td>
<td><strong>24,859</strong></td>
<td><strong>24,419</strong></td>
</tr>
</tbody>
</table>

* Assumes 6,903 MW of existing wind capacity
Scenario 2

- July 17, 2008 Scenario 2 was adopted by the Texas PUC
  - Adequate Capacity for 18,456 MW of total wind generation
    - 4 million Texas homes
- 2,334 miles of 345 kV Lines
  - ROW: 200 – 300 Feet Wide
  - Eminent Domain
  - $5-8 Billion Cost
  - Plus Return on Capital
    - Texas Utilities Code Section 36.051
Pursuant to CREZ, LCRA TSC will build, own, operate four projects:

1. Twin Buttes to McCamey D
2. McCamey D to Kendall
3. Kendall to Gillespie
4. Gillespie to Newton

- 600 Miles of Double Circuit Lattice, 345 kV Lines
- Projects are PUC Designated “Priority”
- Deadlines for CCN is October 2009
- Affected Counties: Burnett, Crane, Ector, Gillespie, Kerr, Kendall, Kimble, Lampasas, Llano, Mason, Menard, Pecos, San Saba, Sutton, Tom Green, and Upton*
County Tax Abatements

- Texas Tax Code 312.001 grants statutory authority to County Governments (acting through their elected County Commissioners and County Judge) to enter into tax abatement agreements with wind companies for wind farm improvements

- Agreements are for a Maximum of 10 years
- Example: 70% for years 1-5, followed by a declining scale for the next 5 years: 60%, 50%, 40%, 30%, 20%, 10%
  - @ .5% tax rate based on a $200 million investment = $1,000,000 annual tax liability
  - Abated @70% = total tax liability of $300,000
Texas Economic Development Act

- Texas Tax Code 313.01 grants statutory authority to School Districts (acting through their elected school boards) to enter into agreements with wind companies.
  - A tax credit for the first two years of the project and an 8 year limitation on the appraised value of the qualified property
  - Tax relief is based on a Minimum Investment and a guarantee to create a fixed number of new jobs within the school district
## Texas Economic Development Act & School Finance

<table>
<thead>
<tr>
<th>Category</th>
<th>Minimum Qualified Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>$30 Million</td>
</tr>
<tr>
<td>II</td>
<td>$20 Million</td>
</tr>
<tr>
<td>III</td>
<td>$10 Million…</td>
</tr>
</tbody>
</table>

- **EXAMPLE:** Under the Statute, a Category III School District has the Authority to limit the appraised value of the Wind Farm in its District to $10 Million even though the project might exceed $200 million in capital*

- **Associated Press - April 5, 2009**
  - 44 Texas School Districts received $248 Million in exchange for $700 Million in Tax Abatements
    - Payments in Lieu of Taxes “PILOT” to I.R.C. 501 (c )(3) Entity
    - Avoidance of “Robin Hood,” Formula for School Finance
Wind Economics

• Capital Intensive
  – Project Costs* = $1,920/kW or $1,920,000/MW
  – Total Capital Required 100 MW Project = $192,000,000

• Tax Equity Financing
  – Wind Company Forms a Partnership with Tax Equity Partner
  – Capital Raised: $100 Million Equity from Tax Partner and Debt from a Lender
  – Partnership Specially Allocates all Tax Benefits (PTC and Depreciation) to the Tax Equity Partner plus Revenue produced from Project for first 10 years
  – When Tax Benefits expire, allocation of Partnership Revenue “Flips” from Tax Equity Partner to Wind Company

• IRS Safe Harbor: Rev. Proc. 2007-65
• Total electricity produced by one 2 MW Turbine = 
  \[2 \text{ MW (2,000 kW)} \times \text{Efficiency Factor (40\%)} \times \text{Number of hours in a year (8,760)} = 7,008,000 \text{ kWh per annum}\]

• \$.02 \times 7,008,000 \text{ kWh} = \$140,160 \text{ Tax Benefit Per Year}\]

• 50 Turbines = \$7,008,000 \text{ Tax Benefit Per Year}\]

• 10 Years of Credit

Total Tax Benefits from PTC
\$70,080,000
Accelerated Depreciation

- Cost of Turbines = $2 million Per Turbine
- $2,000,000 x 50 = $100,000,000 Total Capital
- 5 Years Modified Accelerated Cost Recovery System (“MACRS”)
- $100,000,000/5 = $20,000,000 (deduction) x 35% (tax rate) = $7,000,000 Tax Benefit Per Year

Total Tax Benefits from Depreciation = $35,000,000
Total Tax Benefits

Production Tax Credit = $70,080,000
Accelerated Depreciation = $35,000,000
Total Project Tax Benefits = $105,000,000

Initial Return for Wind Farms
Dependent on Tax Benefits

Cost of Electricity
cents per kilowatt-hour

Source: U.S. Department of Energy
$148 Billion Invested Worldwide in Renewable Energy; $9 Billion in US Wind Industry

- BP – London, England
- Royal Dutch Shell – Hague, Netherlands
- EDP Group – Lisbon, Portugal
- Babcock and Brown – Sydney, Australia
- Endesa – Madrid, Spain
- E.ON – Düsseldorf, Germany
- TXU – Dallas, Texas
- Iberdrola – Bilbao, Spain
- FPL Group – Juno Beach, Florida
Landowner Royalty

• **Land is Necessity**

• **Rent/Royalty Formula:**

• **Total Electricity Produced by 1 Turbine:**
  - \(2 \text{ MW (2000 kW)} \times \text{Efficiency Factor (40\%)} \times \text{number of hours in a year (8760)} = 7,008,000 \text{kWh of electricity Per Year}\)

• **Gross Revenue per 2 MW Turbine in a year:**
  - \(3.5\text{¢/kWh} \times 7,008,000 \text{kWh} = \$245,280 \text{Total Gross Revenue Per Turbine}\)

• **Revenue to Landowner:**
  - 5\% of Gross Revenue = \$12,264.00
  - 6\% of Gross Revenue = \$14,716.80
  - 7\% of Gross Revenue = \$17,169.60
  - 8\% of Gross Revenue = \$19,622.40*
Wind Lease Terms

- Rule against perpetuity
- Hunting Rights
- Subordination of oil and gas rights
- Definition of Gross Revenue
  - Include RECs
- Water
- Easement Appurtenant versus Gross
- Transmission Line Easement
- Bonding
- Assignment
Conservation means development as much as it does protection. I recognize the right and duty of this generation to develop and use the natural resources of our land; but I do not recognize the right to waste them, or to rob, by wasteful use, the generations that come after us.

Osawatomie, Kansas,
August 31, 1910