

WIND ENERGY *-It's Up in the Air!*

Wind Power Comes to South Texas

Presentation for



December 18, 2008

Agenda



- **Past Seven Years**
 - How we Got Here
 - The Green Business
- **Wind Energy Drivers**
 - Las Tres B's
 - Texas # 1 – CREZ - PUC
 - **Components of a Wind Project**
 - Wind & Meteorologist
 - Transmission
 - Wind Lease Overview
 - Permitting & Environmental
 - Pitfalls & Snares
 - **South Texas Wind Projects**
 - Peñascal and Gulf Wind Projects
 - Oilton and Randado Wind Projects
- **Current and Future Projects**
 - Summary



green
BUSINESS





American
Shoreline, Inc.



Las Tres B's

- **Bueno**

Domestic – Local

1MW – 225-300 homes annual use

Time of Day - Seasonal

Jobs – Investment/Tax Base

- **Bonito**

No Emissions – Green Energy

No Water

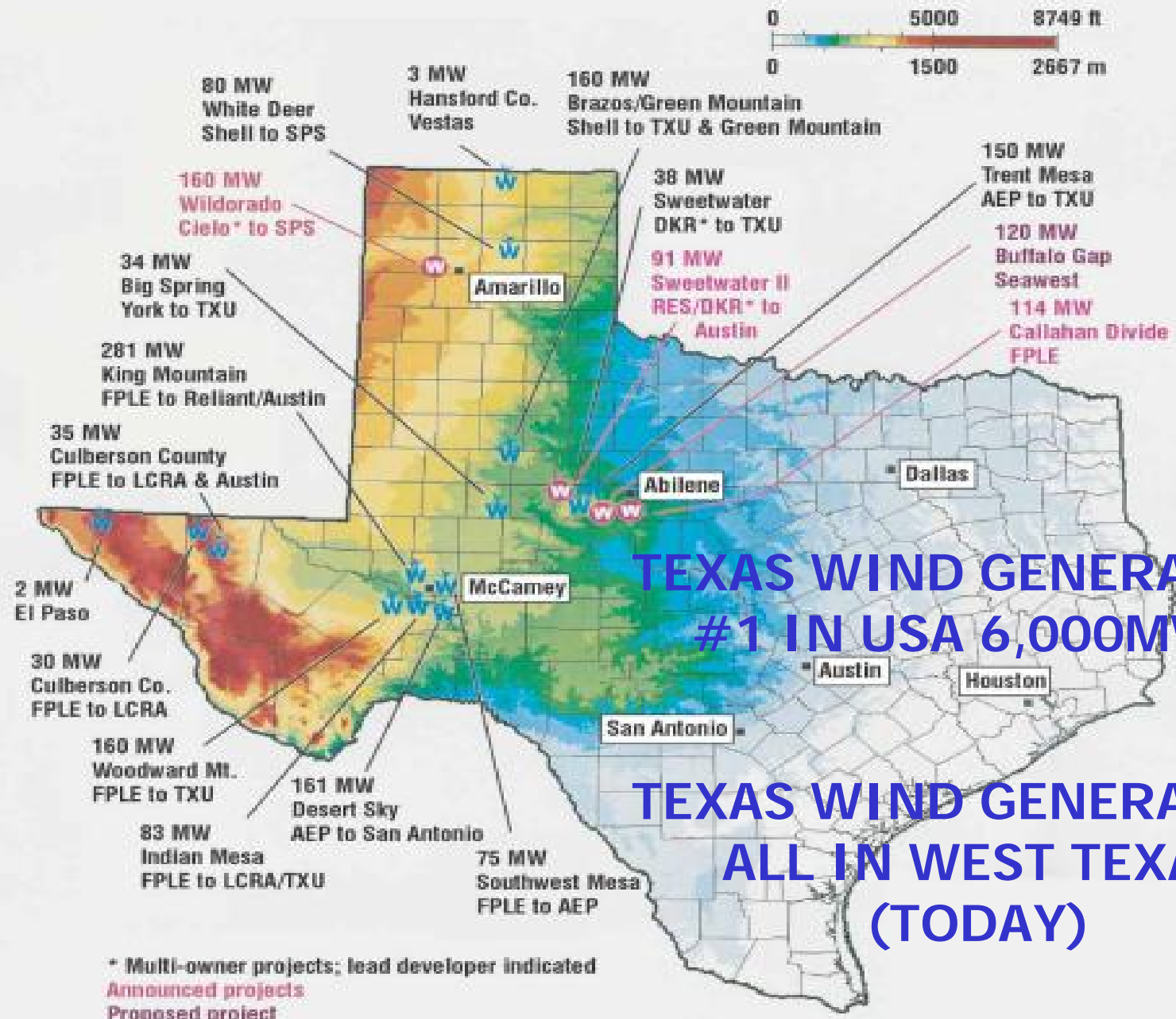
Visual Impact

- **Barato**

No Fuel Price Volatility

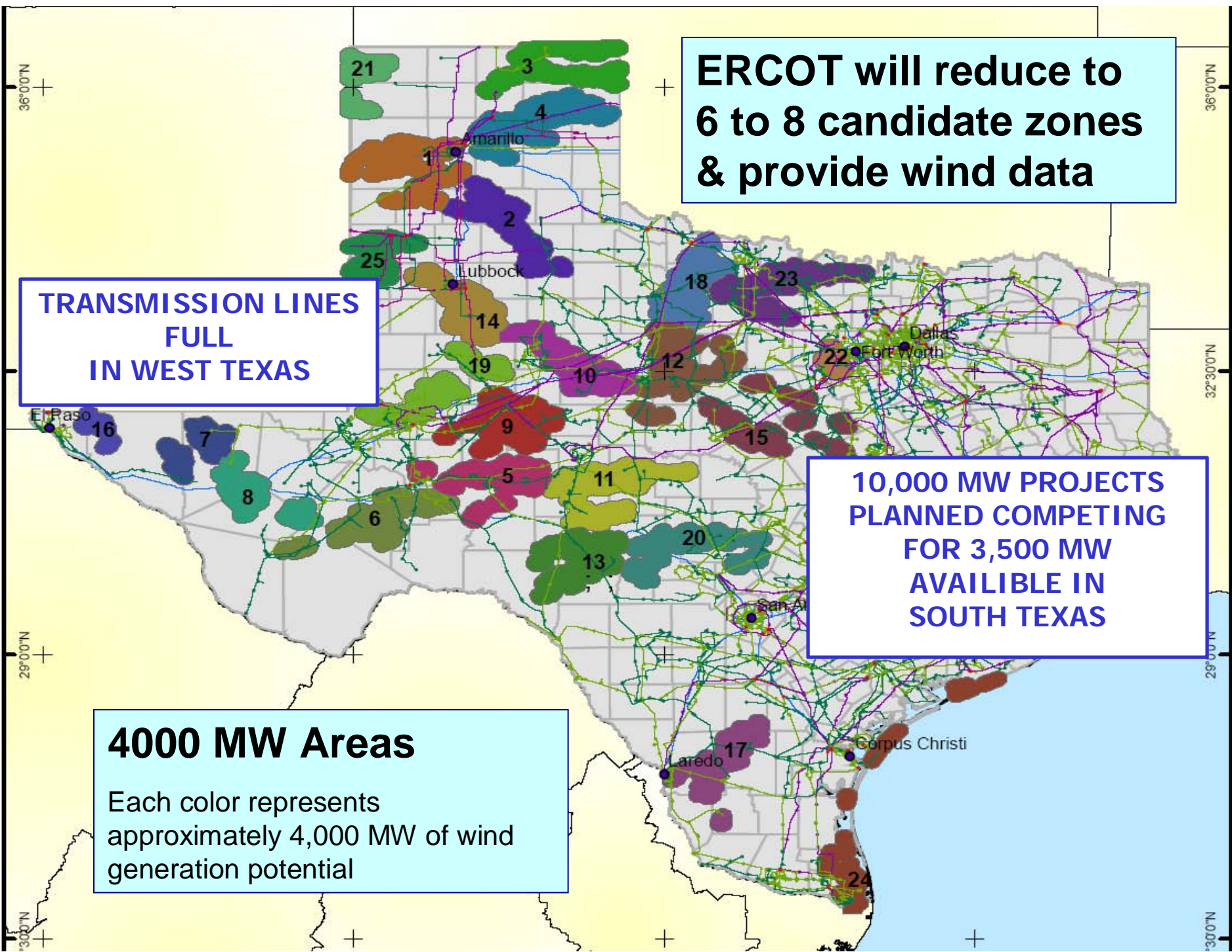
Federal Income Tax Credit

Carbon Bonds



**TEXAS WIND GENERATION
#1 IN USA 6,000MW+**

**TEXAS WIND GENERATION
ALL IN WEST TEXAS
(TODAY)**



ERCOT will reduce to 6 to 8 candidate zones & provide wind data

TRANSMISSION LINES FULL IN WEST TEXAS

10,000 MW PROJECTS PLANNED COMPETING FOR 3,500 MW AVAILABLE IN SOUTH TEXAS

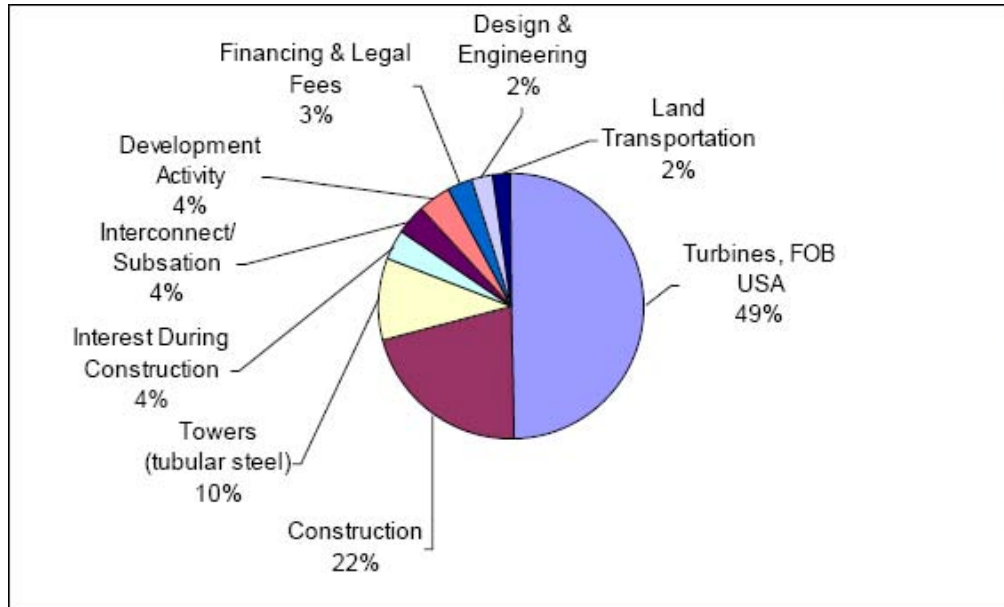
4000 MW Areas
Each color represents approximately 4,000 MW of wind generation potential

WHERE IS THE MONEY?

Multiple Sources of Value

- **Operating Cash Flow**
 - **Power Purchase Agreement – Exp. – City of Houston**
 - **Green Attributes – Exp. Renewable Energy Credits or Carbon Credits**
- **Depreciation**
 - **5-6 Year**
- **Tax Credits**
 - **Federal Production Tax Credits – (PTC)**
 - **State Tax Credits**

EXAMPLE of COSTS/BENEFITS For a 200MW Project



- \$400 Million Project Cost
- 300 Jobs \$40 Million to Contractors
- \$20 Million in Property Tax Rev.
- \$30 Million Royalty
- Power Supply to 55,000 Homes
- No Water Use
- Flat Production Curve - Never runs out
- Long Term Price Stability
- 200MW Displaces Pollutants
 - 46,000 tons of CO_2 (global warming gasses)
 - 107 tons of SO_2 (acid gas)
 - 59 tons of NO_x (smog)

COMPONENTS OF A WIND PROJECT

- Wind – Average wind speed 16_{\pm} mph
 - Capacity Factor – 35%+
- Transmission – Lines with available capacity
- Pricing – Economics must work long term
- Land – Larger the lease the better
 - Must have mortgage protect provisions for lender
- Environmental – Must have negligible risk
- Construction – Access, infrastructure & weather
- Permitting – Multiple pitfalls – FAA, Corp of Eng etc.
- Tax Abatement – Needed to fit current market economics
- Equity – Huge capital investment 200MW = \$400M
- Insurance – Hurricanes, tornados, earthquakes, fires etc
- ECONOMICS, ECONOMICS, ECONOMICS.....

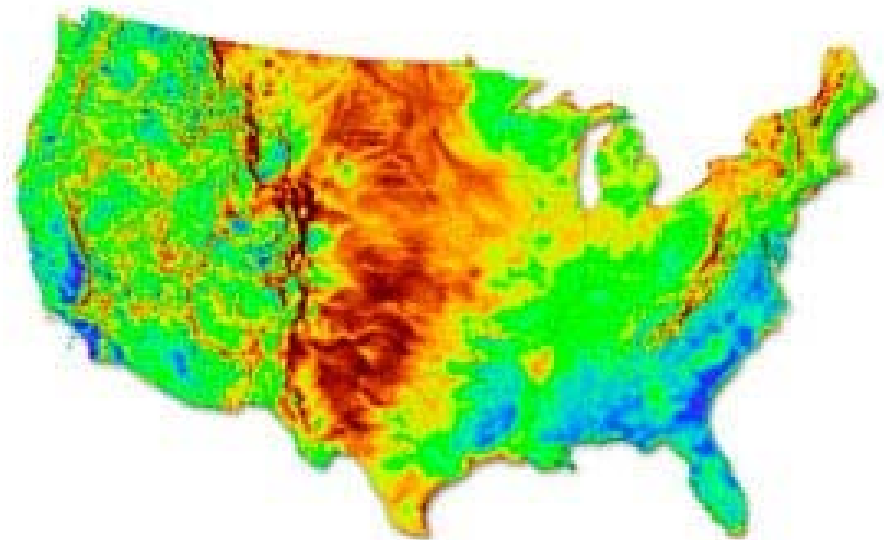
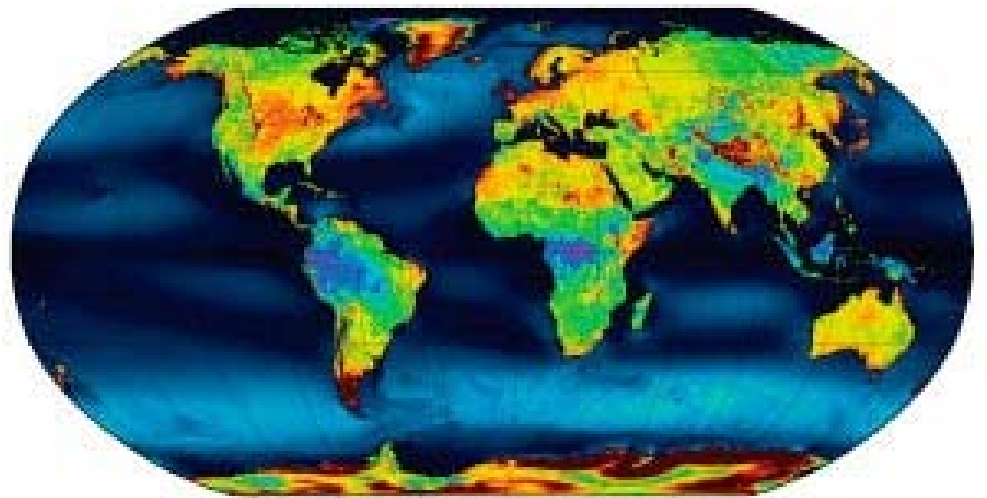

 U.S. Department of Energy
Energy Efficiency and Renewable Energy
 Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable



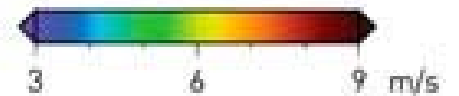
20% Wind Energy by 2030
 Increasing Wind Energy's Contribution to U.S. Electricity Supply

July 2008

Wind speed over land




3TIER
 U.S. National Wind Map
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Wind Resource





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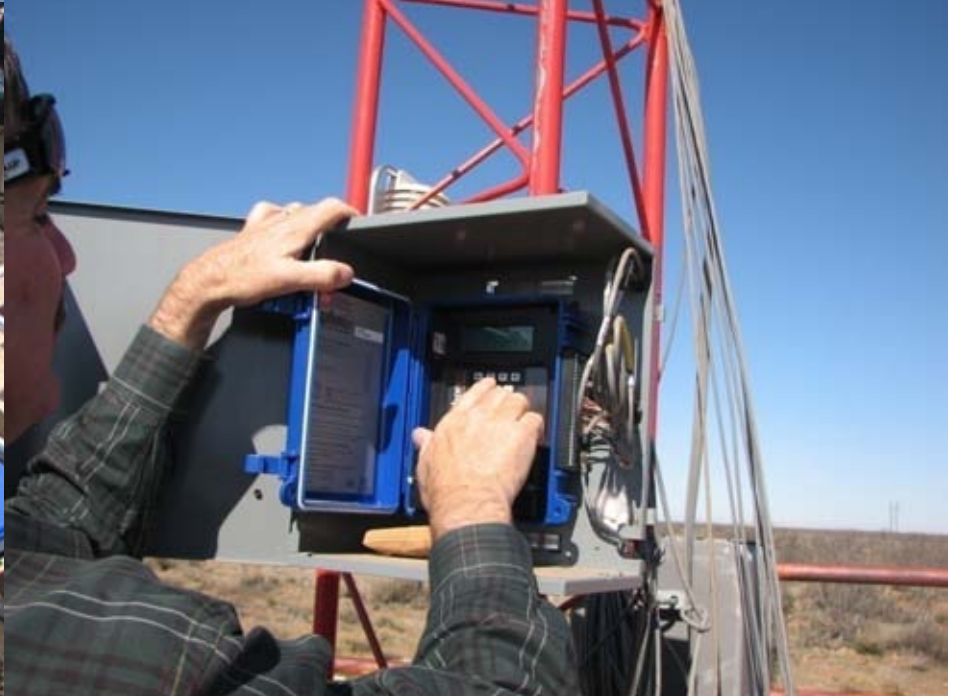
Wind Resource



80M MET TOWER



60M MET TOWER



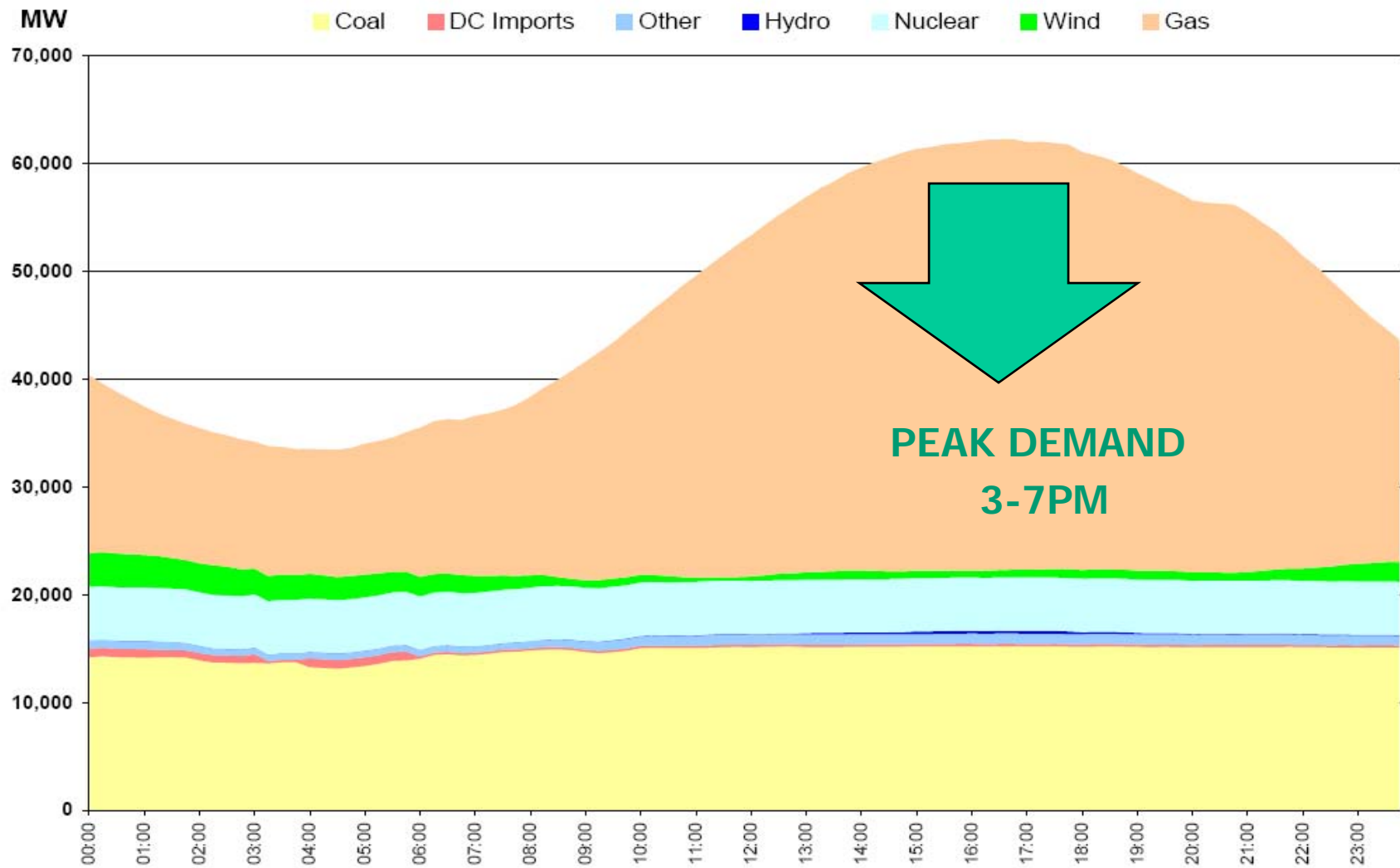
Wind Data & Meteorologist

METEOROLOGIST DUTY LIST

- Tower Installation & Certification
- Average Wind Speed
- Time of Day
- Capacity Factor
- Power Density
- Turbulence & Shear
- M C P
- Extreme Weather Events
- Power Curves for Wind Turbine Procurement
- Turbine Layout
- Archive Data & Retrieval
- Maintenance

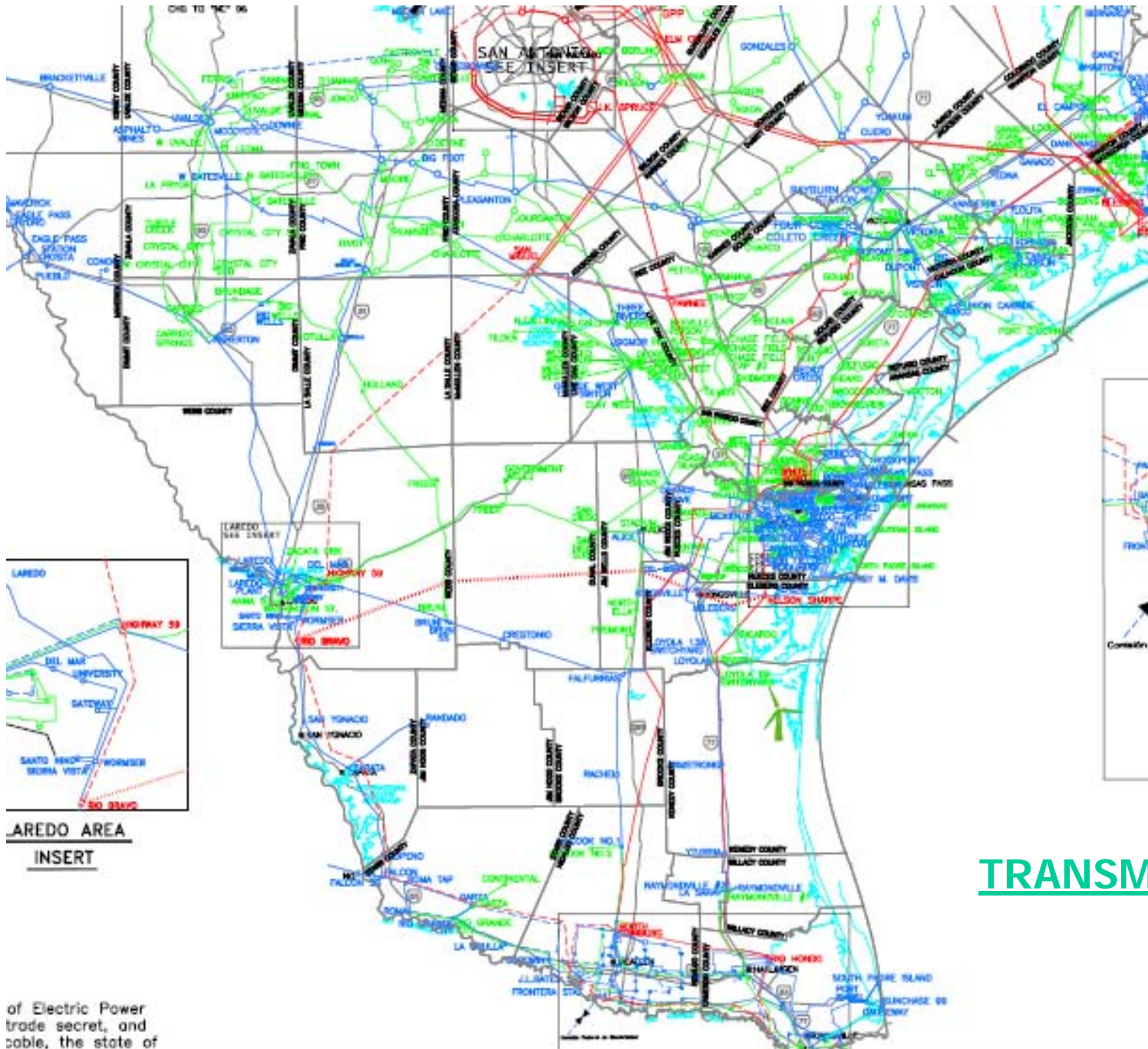
ERCOT Summer Day Load Shape with Fuel Mix

Generation by Fuel - August 4, 2008



Sunrise
345 kV
TRANSMISSION





LAREDO AREA
INSERT

TRANSMISSION

of Electric Power
trade secret, and
cable, the state of

WIND LEASE OVERVIEW

- Surface Lease
 - Agreement Based Upon TX General Land Office Lease
- 5 Year Evaluation Period
- 30-40 Year Lease with Provision for Negotiations after Term
- Escalation Royalty Payments Percentage of Gross Revenue
- Minimum Royalty Payments
- Right to Assign
- Financing Provisions & Mortgage Protection
- Construction Payments for:
 - Surface Damages - Roads, Lines and Turbines
 - Substation & O&M Building
- Removal Bond

PERMITTING OVERVIEW

- ERCOT Interconnection
- FAA – 7460 Notice of Construction Permit
- Microwave Study & Communications Study
- Clean Water Act TCEQ
- Corp of Engineers
- Environmental Studies, Antiquities and Flora/Fauna
- County Building Permits
- Transmission Studies & ERCOT Interconnect Study
- Tax Abatements - School and County
- Community Outreach
- DOT Highway Permits



Permitting



- USFWS – Voluntary Interim Guidelines
 - Avian Risk Assessment
- TAMUK
 - Team of Investigators
 - Head of Biology Department
 - Point Count Surveys
 - IR – Night Counts
 - Bat Detection &
 - Statistician – Avian Biostatistics

TAMUCC

- Radar Ornithology
 - Nobletec X-Band Radar Unit
 - Digital/Color/Records
- Center for Bioacoustics
 - Acoustical Array
 - Chip Note Analysis
 - Density/Species/Flight Patterns



AVIAN ASSESSMENT



BIRD COUNT SURVEYS



**AVIAN RADAR DETECTOR
& FLIGHT PATH ANALYSIS**



ACOUSTIC AVIAN MONITOR



**AVIAN RADAR DETECTOR
& FLIGHT PATH ANALYSIS**



**BIRD COUNT INFRARED
NIGHT SCOPE**



BAT DETECTORS



BIRD COUNT VISUAL & RADAR

EFFORTS TO DATE

- **AVIAN STUDY INITIATED SEPT. 2004**
- **2 UNIVERSITIES & INDEPENDENT CONSULTANTS**
- **4,000 HOURS IN THE FIELD**
- **55,000 MILES ON RANCH ROADS**
- **2,000 POINT SURVEYS**
- **POST CONSTRUCTION SURVEY**



Avian Risk Assessment

- Avian Mortality 2.19 birds per turbine per year
- Comparative Avian Mortality

Vehicles: 60 million - 80 million

Buildings and Windows: 98 million - 980 million

Powerlines: tens of thousands - 174 million

Communication Towers: 4 million - 50 million

- Human Effects of Fossil Fired Plants – Two Plants in Massachusetts – Harvard School of Public Health
 - 159 premature deaths
 - 1,710 emergency room visits
 - 43,300 asthma attacks

Wind Resource Area	Turbines in WRA Expected 2001	Turbines in WRA during study	# birds/turbine/year	# raptors /turbine/year
Outside California				
Buffalo Ridge, MN	~450	~400	2.834	0.002
Foote Creek Rim, WY	133	69	1.750	0.036
Green Mountain, Searsburg, VT	11	11	0.000	0.000
IDWGP, Algona, IA	3	3	0.000	0.000
Ponnequin, CO	44	29	na ^b	0.000
Somerset County, PA	8	8	0.000	0.000
Vansycle, OR/Stateline OR, WA	~338	38	0.630	0.000
MG&E and WPSC, WI	31	31	na ^b	0.000
Subtotal	1,018	589	1.825	0.006
California				
Altamont, CA	~5,400	~7,340	na ^b	0.048
Montezuma Hills, CA	600	600	na ^b	0.048
San Geronio, CA	~2,900	~2,947	2.307	0.010
Grand Total	9,148	11,106	2.19	0.033

PITFALLS OF A WIND PROJECT

- Turbine and Transformer Supply – 2-3 Year Wait
- Transmission Constraints - Example - West Texas
- Pricing – Based upon NG, Supply Demand
- Equity Financing – World Markets
- FAA & Permitting
- Environmental – NIMBY's
- Lease Costs, Royalty, Damages and Special Provisions
- Construction – Accessibility the Key
- Governmental Regulations
- Tax Abatement
- Competition & Overdevelopment of Wind Resource Area

South Texas Wind Projects

- Peñascal and Gulf Wind Projects
- Papalote Creek – San Patricio – E.ON
- Harbor Sunrise – Port of Corpus Christi
- Webb and Jim Hogg Counties –
- Nueces, Cameron, Willacy
- Offshore?



AMSHORE



AMSHORE

AMSHORE CURRENT & FUTURE PROJECTS

– Oil & Gas Exploration –

- 3-D Projects – Drilling and Acquiring Seismic Data
- Horizontal Exploration Well – 2009

– Wind Projects – 8 Projects 4,500 MW

- 475,000 Acres Under Lease
- 3 Projects in Development
- 5 Projects in Negotiations to Co-Development
 - Wind Team to Locate/Lease/Develop Projects in North America

PORT OF CORPUS CHRISTI



The logo for AMSHORE is rendered in a large, blue, serif font. The letters are slightly shadowed, giving them a three-dimensional appearance. The background of the top banner features a blue sky with a wind turbine on the right and a steel structure on the left.

AMSHORE



American Shoreline, Inc.

1250 Frost Bank Plaza

Corpus Christi, Texas 78470 (361) 888-4496



PAUL M. STRUNK – PRESIDENT

PATRICK A. NYE – VICE PRESIDENT

MANNTI C. CUMMINS – WIND PROJECT MANAGER