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Texas Wind Industry's Rapid Growth Creates New Challenges

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In the past decade, Texas began to harness some of its abundant wind potential and, in the process, became an international wind energy leader. The state currently accounts for more than 25 percent of installed wind energy capacity in the United States (see Table 1). But while 2009 brought a new pro-renewable energy administration in Washington, increased public awareness and interest in green technology, and an ever-expanding demand for energy, the growth of the state's new installed capacity fell below 40 percent for the first time since 2006 (see Table 2, p. 2). While the recession-induced credit crunch and falling natural gas prices were two obvious culprits, Texas faces a host of other challenges as it seeks to retain its position atop the domestic wind energy market and attract the capital and new jobs that the booming renewable energy industry can bring.

Advocates for wind energy cite many reasons for a shift away from traditional generation and toward renewable energy – huge reductions

in carbon emissions and other harmful by-products associated with some conventional forms of power, decreased dependence on foreign oil, and economic revitalization of rural areas, to name but a few. As compelling as the arguments for wind energy may be, the growth of wind energy in Texas hinges upon the industry's ability to address issues that may limit future development.

For example, although wind energy has been touted as a green alternative to traditional generation, there is growing concern about the environmental impact of development on certain key species. And on the political front, while the wind industry successfully avoided any major setbacks during the 81st Legislative Session in 2009, the industry must navigate through another session in 2011. In the interim, two state agencies with significant industry influence, the Electric Reliability Council of Texas (ERCOT) and the Public Utility Commission of Texas (PUC), are up for review by the Sunset Advisory Commission.

Table 1
United States Total Power Capacities (MW)
as of 12/31/2009

<u>State</u>	<u>Existing MW</u>	<u>MW Under Construction</u>	<u>Rank (Existing)</u>
Texas	9,410	302	1
Iowa	3,670	200	2
California	2,794	121	3
Washington	1,980	170	4
Minnesota	1,809	60	5
Oregon	1,758	337	6
Illinois	1,547	539	7
New York	1,274	21	8
Colorado	1,246	51	9
North Dakota	1,203	76	10
National Total (all 50 states)	35,159	3,188	

Source: American Wind Energy Association, www.awea.org/projects, accessed 1/26/10.

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Table 2
Texas Wind Energy Growth

Year	MW Installed	Year-over-year % Growth
2005	762	58.93 %
2006	774	37.66 %
2007	1,618	57.19 %
2008	2,671	60.06 %
2009	2,292	32.20 %

Source: American Wind Energy Association

And perhaps most importantly, in order to meet the needs of a large (but geographically distant) consumer base, the industry needs the build-out of the transmission improvements associated with the PUC's Competitive Renewable Energy Zones (CREZ) plan.

All eyes are on Texas as the still relatively young wind industry matures and seeks to assert itself in a rapidly evolving energy marketplace. If the CREZ implementation is a successful antidote to transmission constraints, the plan could provide a model that might be duplicated across the nation. If not, Texas could get left behind as wind energy companies focus their near-term development elsewhere in states like Oklahoma, Kansas, Iowa, and the Dakotas.

The ERCOT Advantage

The rapid growth of the wind energy supply in Texas during the 2000s can be traced to a fortunate convergence between a plentiful natural resource and the state's unique attributes that allow for effective use of that resource. Portions of the vast plains of West Texas and the Panhandle are among the best places in the world for wind energy development, and the farmers and ranchers who own much of that land have proven more amenable to wind development than landowners in other parts of the country. Texas' comparatively permissive regulatory policies and business-friendly environment have also allowed for development timelines much shorter than those in many other states.

Perhaps most importantly, unlike other interconnections in the United States that encompass multiple states and utility companies, ERCOT, the "grid" administrator

responsible for 75 percent of the land area in the state and 85 percent of its load, exists and operates entirely within Texas; the lack of oversight from multiple state governments allows for a greater degree of adaptability for the industry.

ERCOT also has a unique market design that encourages the development of generation projects. Unlike in other regions of the United States, generators in ERCOT are not charged a fee for the use of transmission facilities, nor are they guaranteed the right to deliver their energy to consumers. ERCOT dispatches the least-cost generation first, which forces generators to bid high enough to cover their variable costs but low enough to be dispatched. This open access policy tends to encourage low-cost generation to enter the market. Since wind energy has no variable costs, wind generators can bid low and drive costs down across the market.

The relative ease with which wind energy companies can compete within ERCOT was one of the driving forces behind the development of wind energy in Texas throughout much of the past decade. Texas was also an early adopter of a renewable portfolio standard (RPS), a tool that encourages renewable energy development by mandating targets for renewable generation. Senate Bill 7, passed in 1999, called for 2,880 MW of renewable energy to be installed and integrated into the state's energy portfolio by 2009. As can be seen from a review of installed wind capacity in Figure 1 on p. 3, this goal was met well in advance of the deadline, and in 2005, Senate Bill 20 increased the RPS to 5,880 MW by 2015 and 10,000 MW by 2025.

Working Wind into the Mix

When rural electrification brought power to rural West Texas more than half a century ago, no one envisioned that those same rural areas would someday be producing far more electricity than that needed to serve the local load. As a result, the transmission infrastructure in much of the western part of the state is sparse. As developers realized the opportunities that existed in Texas, they flooded the state with projects. Unfortunately, with the bulk of the population living hundreds of miles southeast, and relatively few transmission lines to connect

Underlying the entire CREZ process is a fundamental "chicken-and-egg" problem – wind developers are hesitant to invest in development in areas where new transmission is uncertain, but the need for new transmission only exists if wind developers commit to projects.

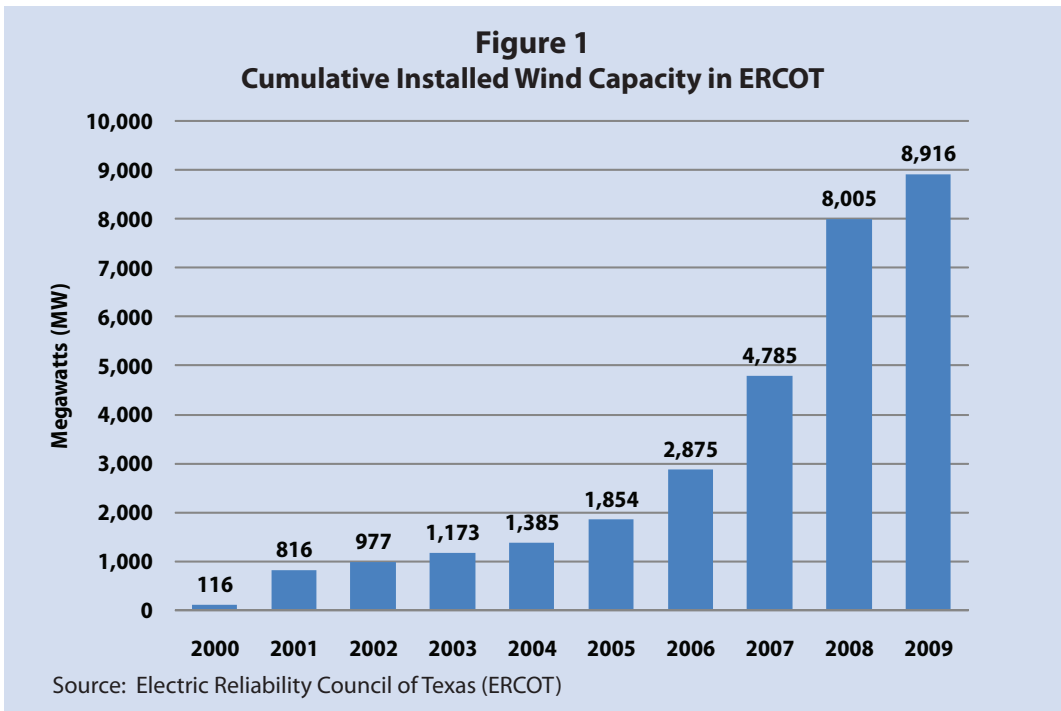
the major load centers to the windy parts of the state, transmission became constrained. Consequently, further development in West Texas, particularly within the ERCOT service territory, slowed significantly in 2009.

The Texas Legislature anticipated this predicament and initiated plans for a solution in the aforementioned Senate Bill 20. This 2005 bill called for the PUC to examine ways to integrate the significant wind resources into the state's energy mix. The PUC began by studying the areas of the state with the most promising wind resources (each one a competitive renewable energy zone, or CREZ) and introduced CREZ proceedings in December 2006. Wind developers were asked to commit to developments within the CREZs of their choosing in March 2007, and in October 2007, the PUC ordered the scenario study, which identified the five workable CREZs and estimated the costs of improving transmission in each one. The PUC eventually settled on Scenario 2 (see Figure 2, p. 4), which calls for lines supporting 18,456 MW of new capacity at an estimated cost of \$4.93 billion. According to a 2008 report by GE Energy, the new transmission lines are expected to save ERCOT consumers more than \$3.4 billion per year on electricity and more than \$1.5 billion per year on fuel costs.

Next, the PUC allowed transmission service providers (TSPs) to apply for the right to

build portions of the transmission upgrades associated with the CREZ system, and in May 2009, the PUC granted contracts to seven of the TSPs, including Oncor Electric Transmission Texas and the Lower Colorado River Authority (LCRA). The Commission assigned each of the seven TSPs a portion of the line and allowed some flexibility in the routing of the line. In the second half of 2009, the TSPs began acquiring easements and holding landowner meetings in counties along the proposed transmission routes.

There is some uncertainty regarding the status of CREZ developments going forward. Underlying the entire CREZ process is a fundamental "chicken-and-egg" problem – wind developers are hesitant to invest in areas where new transmission is uncertain, but the need for new transmission only exists if wind developers commit to projects. As of now, wind energy companies have been asked to provide financial commitment for the areas that they elected early in the process, and the viability of some of the CREZs are in doubt, pending the resolution of that issue. In addition, TSPs beginning to secure easements for the new transmission lines have been met with some resistance and threats of lawsuits from landowners along certain routes. Potential litigation by resistant landowners could delay the construction of the lines, some of which are scheduled to be completed as early as 2011.



The Politics of Wind

The wind industry's political clout has been growing as critical allies from the ranks of West Texas legislators have seen the benefits of wind development in their home districts. At the same time, the industry has also attracted opposition from politicians and interest groups. The industry spent much of the 81st Session beating back bills that sought more stringent and industry-specific siting policies. In that same session, however, two critical pieces of legislation passed regarding the extension of tax incentives for the industry. At issue were Tax Code Chapter 312, regarding tax abatement agreements, and Chapter 313, regarding school district limitations on appraised value of wind farms.

The interim between the 81st and 82nd Sessions has already seen further discussions on siting issues and Chapter 313 questions. The industry will also be involved in the Sunset review of the PUC and ERCOT. The Sunset process is ostensibly a means to refine the mission, internal operations, and performance of the agencies under review. However, feedback is

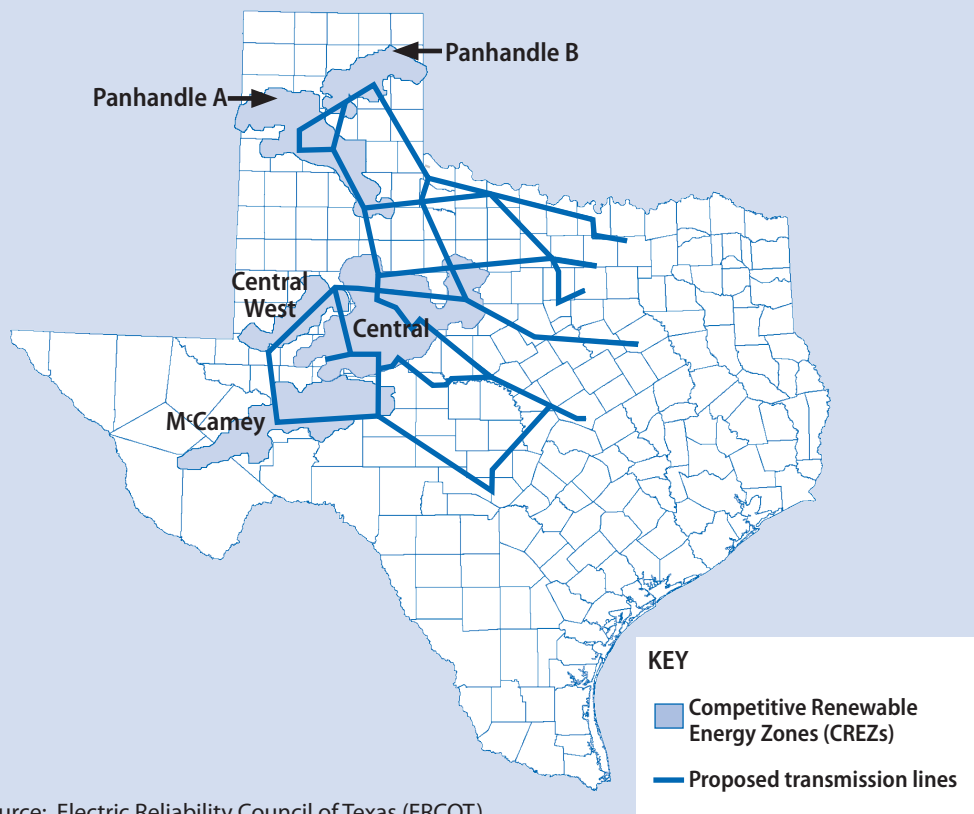
gathered from a wide variety of stakeholders involved with the agencies, and opponents of wind energy could use the process to attempt to modify existing statutes to curb the industry's development.

Other developments at ERCOT could have a major effect on the industry, as well. The long-expected and long-delayed switch from zonal to nodal pricing within ERCOT is due to be fully implemented by December 2010. The current zonal market commonly results in wide price fluctuations and limited ability for dispatchers to resolve congestion between the different Congestion Management Zones. The PUC ordered ERCOT to create a nodal wholesale market design in September 2003, with the goal of improving price signals and dispatch efficiencies within the market. Nodal implementation should improve the flow of energy across the ERCOT grid and relieve some of the congestion that has constricted the industry.

With little available transmission in West Texas, some companies have investigated development possibilities in the Texas Hill

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Figure 2
Public Utility Commission of Texas Transmission Scenario



Source: Electric Reliability Council of Texas (ERCOT)

Country, which features a lower wind resource but a much better position with regard to transmission lines and demand for energy. Many of these companies, however, have met resistance from landowners concerned about wind turbines' impact on viewshed. It will be interesting to see how this issue plays out in a state such as Texas, where personal property rights are rigorously defended.

Of greater immediate interest to the industry are the siting questions raised by environmental groups concerned about the possible impact of wind farms on wildlife. While much has been made of the risks that wind projects pose to migratory birds and bats, future development in the Panhandle region (as well as parts of Oklahoma and Kansas) could be affected by the Lesser Prairie-Chicken, a ground-based species that could be listed as a threatened or endangered species by federal authorities in the years to come. Though Lesser Prairie-Chickens do not fly within the area swept by turbine blades, they are sensitive to the habitat fragmentation that sometimes results from the new access roads and transmission lines that accompany wind energy development. The industry points out that wind development abides by the same guidelines as every other form of generation and should not be treated differently. There is concern, however, that an effort to codify wind-specific guidelines, such as those promoted by the Texas Parks and Wildlife Department (which, as of now, are voluntary), could have a profound effect on the industry in coming years.

Prospects for Further Wind Development

With or without new Texas development, the domestic wind industry will continue to expand in the short-term. The production tax credit (PTC), a financing tool essential to the successful implementation of wind energy, was extended through 2012 by the American Recovery and Reinvestment Act of 2009. First established in 1992, the PTC is a \$0.02 per KWh corporate income tax credit on electricity generated by renewable energy projects. The PTC has lapsed intermittently since its inception, and investment in the industry tends to drop dramatically in years when it lapses. The three-year extension should help

improve investors' confidence in wind energy. The Obama Administration also touts the creation of green-collar jobs as one component of economic recovery.

The creation and retention of renewable energy manufacturing jobs in the United States could be threatened by the world's newest wind energy power – China. With more than 22.5 GW installed capacity and plans for 100 GW by 2020, China has begun to emerge as a nexus for wind power manufacturing, development, and technology advancement. China's ambitious plans for growth could make it the next frontier of wind development. Thanks to Europe's decades-long headstart in wind development, it is the home of many of the industry's largest and most well-established wind energy developers and manufacturers. Though the United States has quickly moved to the forefront of the global industry, among leading wind countries, the U.S. is perhaps most vulnerable to a sudden surge in growth by China.

Although the pace of new project construction in Texas has flagged, the state remains an important battleground for the policy advancements and structural improvements that will promote the long-term growth of the domestic wind market. The industry's ability to assert itself and proactively seek solutions to the various siting challenges facing new wind development in Texas will go a long way toward determining whether it can take full advantage of the new transmission promised by the CREZ improvements. And if the CREZ build-out fulfills its promise of efficient deployment of wind energy and significant cost savings for ERCOT consumers, it could provide a model for the other large-scale transmission improvements needed to fully realize the tremendous wind potential that exists in the states between the Texas Panhandle and Canada. Efficient and timely development of the state's wind potential could help determine whether the United States as a whole will remain competitive on the global wind energy market. ◆

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