HOUSE
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*Texas House of Representatives*

*focus* REPORT

*July 8, 2008*

# *Capturing the Wind: The Challenges of a New Energy Source in Texas*



Wind energy in Texas has developed rapidly in the last decade, benefiting from federal and state tax incentives and from interest in renewable energy due to concerns about carbon emissions and dependence on fossil fuels. However, wind energy development has not been without controversy and challenges. This report describes the current status of wind energy development in Texas and outlines anticipated challenges for incorporating wind energy into Texas' energy future.

In 2007, Germany was the world leader in total overall wind capacity installed, with 22,274 megawatts, and the United States was second, with 16,819 megawatts. Texas has swiftly surpassed California to become the top U.S. wind-producing state, with 4,446 wind-generated megawatts of total installed capacity by the end of 2007. California was second with 2,439 megawatts, followed by Minnesota with 1,299, Iowa with 1,273, and Washington with 1,163. Texas was the first state to achieve one gigawatt, or 1 billion watts, of wind installations in a single year, with 1,708 megawatts of new wind power capacity installed in 2007. This 1,708 megawatts is enough to meet the annual energy needs of almost 375,000 households and could, during peak production conditions, light more than 16 million 100-watt light bulbs.

Although Texas now has more installed capacity of wind energy than any other state, during 2007 wind accounted for only 2 percent of electricity generated in the state. In 2007, Iowa led the nation in the proportion of its power produced from wind energy, with 5.5 percent of all electricity generated from wind.

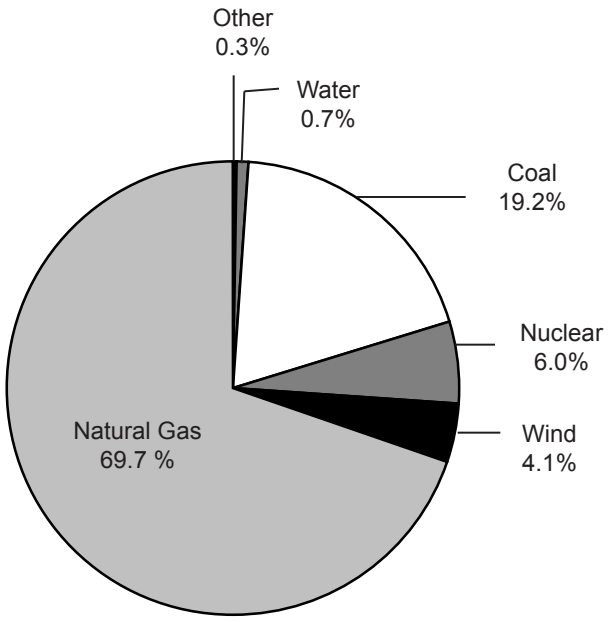
This report describes the current status of wind energy development in Texas and outlines anticipated challenges for incorporating wind energy into Texas' energy future.

The U.S. Energy Information Agency has estimated that U.S. electricity demand will grow by 39 percent from 2005 to 2030. In 2006, wind energy accounted for just under 1 percent of power generated in the United States, according to the Department of Energy (DOE). A recent report from the DOE explores a scenario in which wind would provide

20 percent of U.S. electricity by 2030 and discusses issues, costs, and potential outcomes of such a scenario.

The population of Texas is expected to more than double by 2050, and current projections by the Electric Reliability Council of Texas (ERCOT) show that energy generation also may have to double by 2026 to keep up with demand, taking into account a growing population and aging power plants. ERCOT, which is responsible for operating most of the state's power grid – 85 percent of electric load covering 75 percent of the state's land area – recently reported that nearly 70 percent of the installed capacity for 2007 came from natural gas. Because of this heavy reliance on natural gas, the price of electricity in the wholesale market within ERCOT has become closely correlated with natural gas prices, which have risen rapidly in recent months. Texas is trying to diversify its energy sources, not only to minimize the effects of price volatility but to decrease the vulnerability created by too much dependence on one fuel source.

**Installed Energy Capacity in ERCOT region for 2007**




Source for Data: ERCOT

The federal government has prioritized use of renewable energy sources by providing incentives for their development, such as the production tax credit (PTC) *(see page 11)*. In Texas, SB 7 by Sibley, the electric market restructuring law enacted by the 76th Legislature during its 1999 regular session, established a renewable portfolio standard (RPS) for the state. The RPS requires competitive retail electric providers collectively to phase into the grid a specified amount of qualified renewable energy sources, including wind energy. The combination of rich wind resources, incentives, and mandates for renewable energy, along with the limited regulation of the industry in this state, have helped propel the growth of wind energy in Texas.

According to the Governor's Competitiveness Council, without incentives, wind energy in Texas costs $112 per megawatt-hour over the life of the plant, compared to about $92 to $101 for coal and about $93 to $120 for natural gas, assuming costs for fuel and for constructing facilities. Wind generation produces no fuel costs, so most of the cost is in capital investment. According to the Lawrence Berkeley National Laboratory, wind power prices have dropped nationally by about 80 percent since the early 1980s, but have risen by between $10 and $20 per megawatt-hour in the last five years.

Two of the most wind-rich areas of the state are West Texas and the Panhandle. West Texas is home to two of the largest wind farms in the world, both geographically and in installed capacity. The Horse Hollow Wind Energy Center, extending across Nolan and Taylor counties, produces 735 megawatts (enough to power around 170,000 homes), and the Sweetwater Wind Project in Nolan County produces 512 megawatts (enough to power around 120,000 homes).

Wind energy development also faces hurdles in Texas. One of the biggest is transmission capacity. The largest wind-producing areas of the state are in West Texas and the Panhandle, but the highest energy-using areas of the state – the load zones – are the most populous areas in the eastern half of Texas, including Houston, the Dallas-Fort Worth metroplex, and the I-35 corridor. The existing transmission system's limited capacity is being exceeded quickly and becoming congested with large amounts of additional power generated from wind. To ensure the necessary investments in the transmission grid, the Legislature has called for competitive renewable

## A typical wind farm

Most wind farms in West Texas range from 2,000 acres to more than 100,000 acres. Because of the vast land use typical of wind farms, few wind leases will be contained on just one landowner's property. Instead, separate wind leases often are obtained from multiple landowners for contiguous tracts of land to form one wind energy project. Individual wind turbines, which convert the kinetic energy of wind into mechanical energy or electricity, use a relatively small portion of land - about 3 to 8 percent of the wind farm. Wind farms also include access roads and transmission lines and substations.

A wind turbine consists of three basic parts: the tower; the nacelle; and the rotor blades. In modern designs, the tower is a steel tubular structure with an inside ladder to the nacelle. The nacelle contains the main drive shaft and the gearbox. The machine most typically used has been the 1.5-megawatt turbine, which rises to heights of 80 meters (264 feet) at its hub and has a rotor radius of about 38 meters (125 feet). The largest is a three-megawatt turbine, which is now being used more frequently. It is more than 100 meters tall (340 feet) with a rotor radius of about 45 meters (150 feet).

Spacing of the turbines is influenced by several factors, including terrain, wind speed, wind direction, turbine size, and access to the electric grid. Spacing of the turbines is not regulated, but some experts say the optimum spacing is considered to be in an east-to-west direction with about 1,000 feet between each turbine and about 3,000 feet between north and south rows. The optimum location for a wind farm is one with a steady wind speed that averages at least 13 miles an hour, which generally equates to a wind capacity factor of about 35 to 45 percent. Wind capacity factor is the ratio of the amount of power produced and the power that would have been produced at maximum output.

energy zones (CREZs) to ensure adequate capacity is in place to transmit wind-generated electricity from wind-rich areas in the west to the load zones.

As wind energy matures in Texas, it will confront several issues, including potential environmental impacts, landowner rights and lease agreements, property rights relating to wind, the growth and congestion of transmission lines, reliable integration of wind power into the grid, and limited turbine supplies. The debate also will continue about whether the industry would continue to thrive without government incentives.

**Supporters of government incentives** for wind energy development believe they have given renewable energy sources a much-needed place in the market by making them competitive with traditional energy sources. While some have questioned whether the intermittency of wind makes it an unreliable energy source, supporters of incentives have argued that no power-generation source is 100 percent reliable and the electric grid has multiple sources, with wind power being only one component in the mix. Although wind is not a "dispatchable" resource and cannot be relied upon to blow continually, it is possible to schedule wind power with increasing accuracy and to integrate increasing amounts of wind-generated power onto the grid. According to a study by General Electric (GE), ERCOT could integrate 15,000 megawatts of wind onto the grid using existing technology without radically altering operations.

**Opponents of government incentives** for wind energy development have argued that federal and state incentives are taxpayer-financed subsidies that make renewable energy sources, such as wind, artificially competitive in the market with traditional energy sources, such as coal and gas, while shifting high production costs to taxpayers and consumers. Opponents say wind energy has great potential but some technical obstacles. Wind cannot be stored as can water, coal, or other containable energy sources. Wind does not blow continuously, and electric generation can be produced only when the wind is blowing within a certain speed range. Also, integrating large amounts of a variable resource like wind onto the grid might compromise its reliability.

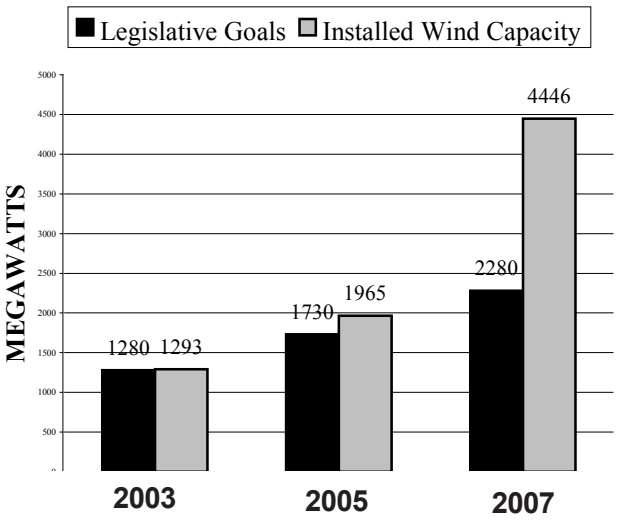
## Renewable energy incentives

In recent years, Texas has enacted laws to ensure the development and use of renewable energy sources, including wind energy. The Legislature established a renewable portfolio standard (RPS) in 1999 and expanded it in 2005 to set targets for use of renewable energy statewide. The 2005 legislation also provided a mechanism for building additional transmission capacity in the state — competitive renewable energy zones (CREZs).

### *Renewable Portfolio Standard*

SB 7 by Sibley, the electric market restructuring bill enacted by the 76th Legislature in 1999, had a goal of promoting retail competition and consumer choice. To help give consumers a choice of renewable energy sources, it established a renewable portfolio standard (RPS) for Texas. The RPS is a market-driven policy created to ensure the use of renewable energy as electricity markets became more competitive. Renewable energy technologies that qualify for the RPS must not rely on energy resources derived from fossil fuels or waste products from fossil fuels. These sources include solar, wind, geothermal, hydroelectric, tidal energy (wave), and biomass, including landfill gas. By 2000, development of wind energy had surpassed that of other qualified renewable energy sources and was well ahead of the goals for renewable energy in the RPS.

**Legislative Goals for Renewables and Installed Wind Capacity Statewide**




Source for data: AWEA

SB 20 by Fraser, enacted in the 79th Legislature's first called session in 2005, expanded the RPS goals to require an additional 5,000 megawatts on top of the then-existing 880 megawatts of renewable capacity in increments totaling 2,280 megawatts by 2007, 3,272 megawatts by 2009, 4,264 megawatts by 2011, 5,256 megawatts by 2013, and 5,880 megawatts by 2015, along with a target of 10,000 megawatts by 2025. The goal of 3,272 megawatts by 2009 was surpassed just with wind in 2007, with 4,446 megawatts of installed capacity by the end of that year. The 2015 goal of 5,880 megawatts recently was surpassed by all renewable sources, seven years early, with more than 6,000 megawatts from wind alone. ERCOT indicates that generation interconnection requests for new capacity for all energy sources currently total more than 106,000 megawatts, with more than 51,000 megawatts coming from wind energy.

As part of the RPS, the renewable energy credit (REC) trading program was established to provide an incentive for developing, building, and operating new renewable energy projects. It requires each competitive retail electric provider to obtain a specified amount of renewable energy by purchasing credits in the renewable energy credit (REC) trading program. The amount required – the load ratio share – is equal to that provider's market share of electricity sales for the year multiplied by the renewable capacity goal. All competitive retail electric providers must purchase and retire their load ratio share of RECs annually.

The REC trading program, administered by ERCOT, allows providers who have purchased more RECs than they need for the mandate to sell or trade their extra RECs (1 megawatt-hour = 1 REC) to providers who need them or want to hold them for other uses. ERCOT issues RECs quarterly to REC generators based on meter readings. A REC can be sold, transferred, and retired independently of the megawatt-hour of energy it represents. The life of a REC is three compliance periods, with a normal compliance period being one calendar year. Any additional RECs purchased may be kept for the following year or up to the life of the REC. Entities without an RPS mandate — including municipalities,

## Intermittency and reliability of wind: The February 26 grid emergency

On February 26, 2008, a sudden drop in wind contributed to a loss of electric grid stability, triggering an emergency over the ERCOT grid that threatened rolling blackouts in the region. Some said the event exemplified the problem with wind's intermittency. Others said the event was unique and rolling blackouts were averted because the system worked.

**Supporters of wind's reliability** as an energy source say many factors contributed to the emergency in February. A cold front caused consumers to draw more power than ERCOT had projected, and several traditional power plants failed to provide the amount of electricity to the grid they had promised, but the sudden drop in wind immediately behind the cold front drew the most attention. In response, ERCOT immediately cut power to "interruptible customers" – typically, large industrial customers that agree to forego power during grid emergencies in exchange for lower rates – shaving about 1,100 megawatts from the demand in about 10 minutes. According to ERCOT, no other customers lost power, the "interruptible customers" were restored within 90 minutes, and the emergency was over in three hours. ERCOT has a system that makes it possible to forecast a drop in wind, so system operators can plan for other energy sources, such as natural gas. Natural gas is a "load following" energy source that can be ramped up and down quickly when forecasters see a decline or surge in wind. According to ERCOT, the forecast information was not relayed to the system operators. ERCOT plans to switch in the next year from a zonal wholesale electric market to a nodal wholesale market, which will change the way they manage congestion on transmission lines, price units of electricity, and dispatch power within the ERCOT region. The forecasting system also will be automated, reducing chances for error.

**Critics of wind energy's reliability** say the February 26 emergency exemplified wind's intermittency problem. Wind's intermittency diminishes its cost-effectiveness and efficiency as an energy source. With more capacity from wind, it would be necessary to have an equivalent amount of back-up generation from another energy source when the wind was not blowing. When wind was surging, traditional back-up energy sources would be left idling, incurring costs and emitting pollution with no purpose. A General Electric study of ancillary services has shown that this problem will be more pronounced as more wind capacity is installed. It predicted that when Texas' wind capacity hits 15,000 megawatts, wind-induced drops of 2,400 megawatts in less than half an hour will be an annual occurrence.

cooperatives, and river authorities — may participate in the REC program voluntarily. The PUC may cap the price of RECs used to satisfy the RPS and may suspend the RPS target if necessary to protect the reliability and operation of the electric grid.

### *Competitive Renewable Energy Zones (CREZ)*

When the RPS was established in 1999 to encourage more access to renewable energy sources, it did not provide for expansion of the transmission system to accommodate the increased installed capacity that the RPS requirements would produce. The electricity generated by wind quickly exceeded the limited transmission system available to export the power out of the wind-rich western region and into the load zones in the eastern part of the state, resulting in congested transmission lines and curtailment of the use of wind power.

When the RPS was expanded in SB 20 by Fraser in 2005, it also provided a mechanism to ensure that sufficient transmission infrastructure would be available to meet the state's renewable energy goals. Wind power developers had been reluctant to build wind projects in areas without sufficient transmission capacity, and utilities had been reluctant to install transmission capacity in locations with no power generators. SB 20 charged the PUC with designating competitive renewable energy zones (CREZs) throughout the state in areas

with suitable land and sufficient renewable energy potential. The PUC also was required to develop a plan to construct transmission capacity necessary to deliver energy from these zones to the electric customers. The PUC adopted a rule that required ERCOT to study wind energy production potential statewide, established criteria and a procedure for designating CREZs, tied financial commitments from renewable energy developers to the transmission licensing process, and established obligations for companies that intended to develop renewable generation in a CREZ.

ERCOT filed the results of their study in December 2006 after consulting with the Southwest Power Pool (SPP), the regional transmission organization for parts of the Panhandle, northeast Texas, and all or parts of several surrounding states. The ERCOT study identified 25 geographic areas that the PUC could designate as CREZs. It also indicated that the existing transmission network was fully utilized for transferring wind energy from West Texas and that new bulk transmission lines were needed.

In July 2007, the PUC designated eight out of the 25 potential areas as CREZs. The CREZs were combined into five zones: one in the area around McCamey in Upton County, two in the Abilene and Sweetwater area, and two in the Panhandle. The PUC outlined four scenarios for different levels of wind development in the CREZs. ERCOT conducted a study – the CREZ Transmission Optimization (CTO) study – to design transmission plans for the four scenarios. According to ERCOT, the CTO study, filed with the PUC in April 2008, evaluated a variety of transmission solutions and hundreds of individual plans, using three overarching criteria: system reliability; sufficient transfer capacity; and how "beneficial and cost-effective to consumers" each plan would be. The estimated costs for building transmission facilities, excluding collection costs, for each scenario are:

- Scenario 1, Plan A, 12,053 MW, $2.95 billion;
- Scenario 1, Plan B, 12,053 MW, $3.78 billion;
- Scenario 2, 18,456 MW, $4.93 billion;
- Scenario 3, 24,859 MW, $6.38 billion;
- Scenario 4, 24,419 MW, $5.75 billion.

Recent debate has centered on which scenario for building transmission facilities would be the most appropriate choice. Supporters of the most aggressive scenario, which also would be the costliest, say it would provide much-needed transmission lines to accommodate current wind projects and encourage future wind energy development. Supporters of a more modest scenario say that transmission should be phased in so that the reliability of the grid can be assessed and the plan expanded as necessary. This less costly approach would ease the burden on the rate payer. If the most expensive scenario is selected, it could be years before the lines were entirely utilized, they say.

ERCOT commissioned GE to study the level, type, and cost of additional ancillary services that might be required to maintain the reliability of the system for increasing levels of wind generation. Ancillary services are services procured by the ERCOT power market and intentionally reserved in the event they are needed to control system frequency and to maintain reliable operation of the grid. ERCOT filed the study with the PUC in April.

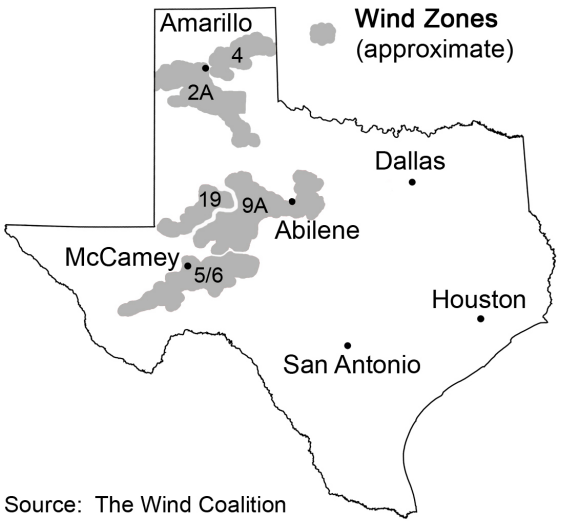
The CREZ final order is in docket no. 33672, a contested docket at the PUC. Open meetings and hearings will be conducted before a scenario is selected and a final order issued. The PUC had hoped to reach a decision by June, but for procedural reasons resulting from due process claims has permitted additional evidence. The CTO and GE studies have been admitted into the record and all parties allowed to cross-examine, present, and rebut evidence about both studies. The final order will be considered at the PUC's July 17, 2008, open meeting. The PUC also is conducting a proceeding to select the entities responsible for constructing the transmission improvements necessary to implement the PUC's decision.

The two zones identified in the Panhandle are within the SPP, outside the geographic area of ERCOT. Companies building the transmission lines that will extend into the SPP area would need to receive an acknowledgement from the Federal Energy Regulatory Commission (FERC) that building outside the ERCOT area will not result in a change in FERC jurisdiction over those companies. The ERCOT area is wholly within the state of Texas and therefore not generally subject to federal regulation as are other service grids that cross state lines.

Once the CREZs are finalized, the PUC will select transmission providers, and some of the transmission lines will require routing studies and further evaluation by the PUC to decide whether to issue a certificate of convenience and necessity for the lines. When the steps

**Competitive Renewable Energy Zones**

*These five zones are preliminarily designated by the Public Utility Commission of Texas (PUC) as having suitable resources and land area for the development of generating capacity from renewable energy technologies, including wind. Official designation of zones is expected in upcoming months.*




Source: The Wind Coalition

are completed, construction of the transmission facilities will begin between the CREZs and the urban areas. According to the PUC, the transmission facilities will be paid for by all consumers across the ERCOT grid and could result in roughly a 4 percent to 7 percent increase in residential electricity bills. The build-out for the expanded transmission capacity may take from three to five years.

**Supporters of the CREZ transmission system** say that studies show that over time, production savings and consumer savings will exceed the cost of investing in new transmission lines for wind power. They point to results of a study by ERCOT that evaluated 12 options for building transmission capacity for an additional 1,000 to 4,600 megawatts of wind power. Similar results were found in the CTO study for scenarios with up to 11,500 megawatts of additional wind power.

Wind energy, which does not use fuel, will lessen the amount of fuel burned for electricity generation, and the zero marginal cost of wind energy helps drive down electricity market prices. The addition of wind generation to the ERCOT grid is expected to result in reductions in wholesale market prices that would more than offset the cost of transmission. Also, the CREZ designations do not apply exclusively to wind energy projects but to all renewable sources, and the resulting transmission lines will be available to all energy sources.

**Opponents of the CREZ transmission system** have argued that the cost of transmission is too high for an energy source that is not reliable, runs on average at only a 35 to 40 percent capacity factor, and has problems with intermittency that make it potentially dangerous to the stability of the electric grid. The high cost ultimately will be passed on to ratepayers in the ERCOT region, resulting in more financial support for an already heavily subsidized industry. Also, the transmission lines could cause landowners to lose property through eminent domain proceedings.

### *Eminent domain controversy*

An example of how the use of eminent domain to construct transmission lines has sparked local controversy is a project by Mesa Power LLP, owned by energy tycoon T. Boone Pickens. The project has drawn opposition from residents in more than five counties who are concerned about losing their property to accommodate a transmission line for Mesa Power's Pampa wind energy project in the Panhandle. SB 3 by Averitt, the omnibus water legislation enacted by the 80th Legislature during its 2007 regular session, allows clean energy projects to use rights of way held by a water district to host transmission lines. Joining the Pampa wind energy project with the Roberts County Fresh Water Supply District No. 1 would allow the wind energy project to use the eminent domain powers of the water district to acquire land for the transmission line.

The transmission line would run 250 miles from Roberts County to west of Fort Worth, delivering power to the grid. A privately owned transmission line of this magnitude has never been tried in Texas. It would be new territory for the PUC and for the existing regulatory framework by which transmission lines are regulated.

The Pampa wind energy project is expected to grow to a 4,000-megawatt wind farm by 2014. Advocates for the project say the United States needs to decrease its reliance on foreign oil by relying more heavily on

domestic energy sources, especially renewable energy sources such as wind energy, which also will boost the local economy.

## Economic development

One of the biggest benefits anticipated by supporters of wind energy development is the potential stimulus brought to economically distressed communities in the state, especially West Texas and the Panhandle. More than 100 cities, counties, and other organizations in West Texas and the Panhandle recently adopted resolutions supporting wind energy development in their areas. Community leaders, in cooperation with the Texas State Technical College - West Texas, recently formed the West Texas Wind Energy Consortium to educate people and to coordinate and gain community support to capitalize on wind energy in West Texas.

Wind turbines are expensive, high-capital items, with some of the larger turbines valued at several million dollars. Wind turbines generally have high appraised values that depreciate slowly and generate high local ad valorem property taxes, a significant factor in the otherwise low operating cost of a wind generation facility.

Some economically deprived rural counties and school districts with low tax bases benefit from having wind generation facilities installed in their areas — in some cases, such as in Shackelford County in north central West Texas, almost doubling the tax base. Some counties and school districts have offered ad valorem property tax abatements to developers as an incentive to build, and it is common now for developers and companies, when assessing a potential site, to request a tax abatement from the county or the local school district.

As wind turbine design evolves, the control of intellectual property rights also has become a factor in choosing a location for those who supply the technology for blade design, storage, and other advancements in the industry. The Lone Star Wind Alliance, a Texas-led coalition of universities, government agencies, and corporate partners, submitted proposals to the federal government to recruit research and development and testing facilities to locate in Texas. Vestas Wind Systems, a Danish wind energy company, recently announced

## Storage technologies for wind energy

It is possible to store energy produced by wind during off-peak demand times and integrate it into the grid during peak use. Several technologies make this possible, although they are not currently being used in Texas.

*Compressed air energy storage* (CAES) is a new technology that uses caverns mined within salt domes to store compressed air. Electricity generated by wind at off-peak times is used to power a generator to compress air into an underground cavern serving as a storage reservoir. When demand peaks during the day, the process is reversed by bringing the air back up to the surface to be heated with natural gas, causing it to expand and rush through combustion turbines that power a generator. This requires less gas than is required to produce power during peak demand periods. This technology is being considered for use by Shell Wind Energy in partnership with Luminant (formerly TXU) for a proposed wind project in Briscoe County in the Panhandle.

The *distributed energy storage system* (DESS) is a battery system that places storage close to the load. It sends the energy produced by wind in the off-peak hours of the night over open transmission lines to be stored in the substations of the cities that will need that energy during the day. This technology is being developed by Pacific Gas and Electric in California and is expected to be deployed some time this year. Also, American Electric Power (AEP) is developing this technology in their 11-state service territory, which includes South and West Texas. (*continued, bottom of page 9*)

that it will open its North American research center in Houston in 2009. It is expected to be fully operational in 2010 and will employ at least 100 people. Vestas will conduct joint research with Texas universities, which have agreed not to publicize information obtained in the research in order to protect Vestas' opportunity to patent the findings. Similar agreements were made for a wind turbine blade-testing facility that will be owned and operated by the University of Houston in partnership with the National Renewable Energy Laboratory and the U.S. Department of Energy. The facility will be located in Ingleside, outside of Corpus Christi, and is expected to attract wind turbine and blade manufacturers to Texas.

### *Tax Abatements*

Chapters 312 and 313 of the Tax Code are primary sources of economic development incentives for Texas local governments. Chapter 312 allows cities and counties to create reinvestment zones and to enter into property tax abatement agreements with companies for up to 10 years. Because it is less likely that a wind farm will be located within a municipality, wind developers tend to focus on county tax abatements. The Texas Economic Development Act, in chapter 313 of the Tax Code, allows school districts to attract new taxable property by granting tax abatements or limitations on appraised value for up to eight years on qualified investments or on facilities constructed within the school district boundaries.

The intent of the Texas Economic Development Act is to attract large employers, such as manufacturers, that will make a required level of investment and create new jobs that meet certain wage and benefit requirements. Qualifying property goes on the tax rolls at full value for two years, usually at the construction phase, followed by an eight-year abatement on the appraised value of a property for the maintenance and operations portion of the school district property tax. The investment remains fully taxable for debt service taxes. The limit on taxes applies in tax years three through 10 after approval of the application, but once granted the limitation, the applicant has an additional incentive in the form of a tax credit on taxes paid in years one and two on the portion of the appraised value in excess of the limitation. To qualify for a chapter 313 agreement, a company must be a new state business taxpayer in good standing. A qualifying project in a rural school district must create at least 10 new permanent

The *pumped hydro storage* method stores and produces electricity to supply peak demands by moving water between reservoirs at different elevations. At times of low electrical demand, excess generation capacity is used to pump water into the higher reservoir. At times of higher demand, water is released back into the lower reservoir through a turbine, generating electricity. This technology requires two nearby reservoirs at considerably different heights — a geographic limitation in Texas, which is largely flat.

**Supporters of storing wind energy** point out that peak energy use is during the day but the wind blows mostly at night. Storage would help reduce the variable flow of electricity produced from wind. If used properly, they say, storage could reduce constraints in the transmission system and help to balance and bring more electricity to the grid without the emissions problem created by building additional conventional plants. An energy storage portfolio standard even could require every utility or transmission distribution center to store certain amounts of energy using some form of storage capability.

**Critics of storing wind energy** have said that it is not economical or feasible to store electricity. Storage may not be useful in the near future unless there is a driving economic factor, such as large price differentials between day and night, to spur additional research and development necessary for the storage technologies to be market ready. Energy storage could create confusion about the amount of royalty payments to landowners because the electricity generated would not immediately be sold to the grid. Time delays could affect payments because ERCOT makes price adjustments every 15 minutes.

jobs, and a project situated in an urban area must create at least 25 jobs.

A county or school district offering tax abatement to a wind developer will forego the ad valorem property taxes associated with the high-value turbines until the abatement period terminates. For example, if a county offers a wind-generation facility an abatement period of 10 years, in the 11th year the facility would begin paying ad valorem property taxes based on the remaining value of the turbines. Wind turbines typically have a life of 20-25 years and are slow to depreciate, leaving a fairly long life of taxing potential.

*A county or school district offering tax abatement to a wind developer will forego the property taxes associated with the turbines until the abatement period terminates.*

In some instances, counties or school districts have offered a 100 percent tax abatement for a specified amount of time, with a promise from the developer of some form of payment in lieu of taxes, such as a certain dollar amount paid directly to the taxing entity to build a school or some other project that will benefit the community. In other instances, counties or school districts have offered partial tax abatement for a specified amount of time. If developers receive a 50-percent abatement, they get a break on their taxes, while the county or school district immediately benefits from an increase in their tax base.

**Supporters of incentives such as tax abatements** say they are an important tool for attracting and keeping wind developers in Texas. Texas has a high property tax rate on capital-intensive projects like wind energy. While Texas has many resources that are attractive to wind energy developers seeking to locate in the state, the high tax rate is a disincentive when location decisions are made. While opponents argue that offering tax abatements costs revenue, that argument assumes that those companies were going to locate in Texas even without the incentive of a tax abatement.

While the Emerging Technology Fund and the Texas Enterprise Fund are tools to aid in economic development, Texas still is not always competitive. Texas recently lost a bid to be the U.S. headquarters for a Spanish wind company, Gamesa Corporation, as well as the site for several of their manufacturing plants. The bid ultimately was awarded to Pennsylvania, which offered a more attractive incentive package, including about $10 million in tax credits, grants, loans, and tax-free status until 2018 for one of the manufacturing plants.

In the rural, economically distressed areas of West Texas and the Panhandle, where wind projects and turbine manufacturing plants likely would consider locating, the creation of 10 or more good jobs is a boon to the local economy. According to the Office of Rural Community Affairs (ORCA), McCamey, an old oil and gas town, now has 40 good new jobs because of the wind energy industry that has built up there. The Wind Coalition has said that chapter 313 applications waiting for approval by the Comptroller's Office, mainly wind projects, could result in a total investment as high as $12.5 billion, mainly in rural Texas.

Supporters of tax incentives also say that a permanent extension of the federal PTC (*see page 11*), along with state incentives and tax abatements, would facilitate continued success in the wind industry in this state and help kick-start the use of other renewables.

**Opponents of incentives such as tax abatements** argue that they are an unnecessary loss of revenue to the state, especially chapter 313 tax abatements for school districts. School districts are guaranteed a certain amount of property tax revenue from the state. If a school district abates those taxes, the state will have to absorb the cost through the school finance system and make up the difference with other types of funding, including general revenue. According to the Center for Public Policy Priorities, chapter 313 agreements are expected to reduce local school property tax revenue to the Foundation School Program by more than $500 million in fiscal 2010-11.

Many of the jobs created by chapter 313 projects cost more than $100,000 per job in lost property tax revenue. By contrast, the Texas Enterprise Fund has been spending roughly $10,000 for each new job. With superior wind resources, a trained work force, an open and unregulated market, a closed electric grid that prevents competition from wind energy imported from other states, and

abundant natural gas reserves serving as a complement to wind energy, Texas provides multiple inducements to locate in the state without the need to forego taxing potential and revenue.

Opponents of tax incentives also point out that with all the incentives available to the wind industry, producers have been able to underbid competing energy producers by offering wind energy at a negative price on the market and still make a profit. Despite federal and state tax incentives, wind energy remains more expensive per megawatt-hour than traditional energy sources.

*Job creation*

A wind power development can employ as many as 300 people during project construction. One technician is needed for about every three turbines during operations. Many wind power developments use local labor to construct the projects, including pouring cement for the turbine foundations, assembling and erecting the turbines, building the access roads, and operating and maintaining the turbines when they are completed. The wind industry has created 1,124 direct jobs in Nolan County, about 18 percent of the workforce in that area, according to the West Texas Wind Energy Consortium. That number is expected to increase to 1,330 by the end of 2009. One of the largest wind-generating electric companies in West Texas, FPL Energy, has partnered with Texas State Technical College System - West Texas for a wind turbine maintenance training program and has a parts center and land service office in Abilene.

Texas is home to only a small handful of turbine part manufacturing plants – in Brownwood, Coleman, Round Rock, and Abilene. Most of the parts are manufactured elsewhere and brought in from other states or from Europe. Turbine manufacturing worldwide has not kept pace with the rapid increase in development demands, prompting constraints on supply and a need for additional

## The federal production tax credit

The federal renewable electricity production tax credit (PTC), originally authorized by Congress in the Energy Policy Act of 1992, is a per-kilowatt-hour tax credit available to taxpayers for electricity generated by certain energy resources, including wind, biomass, solar, geothermal, hydroelectric, refined coal, Indian coal, municipal solid waste, and small irrigation power. Taxpayers may qualify for the credit if they produce electricity from certain renewable resources to sell within the taxable year**.** For wind energy, the PTC applies only to commercial and industrial wind systems, not to the small wind systems used to power individual homes or businesses.

The PTC provides a 1.5-cent-per-kilowatt-hour tax credit and is available for the first 10 years that a generation facility is in operation. The credit is adjustable for inflation and currently is 2 cents per kilowatt-hour for most of these technologies. Electricity from open-loop biomass, small irrigation hydroelectric, landfill gas, municipal solid waste, and hydropower receives half that rate, which currently is 1 cent per kilowatt-hour. In an effort to thwart over-reliance on government assistance, the PTC contains a "double-dipping" provision that reduces the credit by the amount of any other public money used in the total cost of the project.

The PTC is not a long-term incentive. Since establishing the tax credit, the federal government has provided several one- to two-year extensions, but also has allowed the credit to lapse in three different years. The PTC has not lapsed since 2005, but it is set to expire at the end of this year unless Congress votes to extend it again. With no lapse in the credit since 2005, promoters of wind energy say the industry has benefited from three years of increased stability and growth, resulting in a continual increase in new wind power generation. Opponents of the PTC say that wind energy production should rely on market forces, especially as high oil and gas prices have made the industry more attractive and competitive, not on government subsidies that have resulted in more than $2 billion in lost revenue to the federal government since 1995.

manufacturing plants. Certain wind energy corporations that manufacture turbines have said they are fully committed and unable to fulfill any additional orders for the next 18-24 months.

Texas has begun to attract supply-chain companies that build components of wind turbines. Barr Fabrication in Brownwood (111 employees by the end of 2008) builds the insides of the towers, and Wind Clean in Coleman (140 employees) constructs the towers. Tower Tech Systems, a subsidiary of multi-tiered wind energy company Broadwind Energy, Inc., recently announced it would build a tower manufacturing plant in Abilene, bringing 150 jobs to the area. Also, the city of San Angelo currently is the only Texas finalist to be the location for the first North American wind tower manufacturing plant for a Portugal-based company that is one of Europe's largest construction companies. The City of San Angelo Development Corp. and the city council plan to offer a $5.6 million incentive package to entice the company to select San Angelo over competing locations. The manufacturing plant could produce 200 new jobs in the San Angelo area.

### *Income from leases*

Farmers and other landowners have sought to increase the productivity and profitability of their land by leasing it to wind developers for placement of turbines. Although wind farm projects can span many acres, the small footprint of an individual turbine is attractive for many farmers and ranchers because it allows them to grow crops and raise cattle with little interference. Another attraction for landowners who enter into lease agreements is that they can produce a stable stream of income from royalty or lease payments. According to the American Wind Energy Association, a landowner may expect an estimated income of about $2,000 a year from a single utility-scale turbine. For a 250-acre farm, with income from wind at about $55 an acre, annual income from a wind lease would be $14,000, with no more than two to three acres removed from production. The term of a wind lease usually is about 25 years. Wind turbines are viewed by some as a second crop or second source of income to replace payments from long-depleted oil wells.

### *Attorney general opinions*

On January 29, 2008, Texas Attorney General Greg Abbott issued an opinion (GA -0600) concerning section 312.402(a) of the Tax Code. The opinion concluded that "fixtures and improvements owned by the wind turbine company as personal property would not be 'real property' that may be the subject of a tax abatement agreement under section 312.402(a)." This calls into question whether a county or school district may continue to grant wind farm developers abatements and limitations on property taxes if the developers are not able to apply in their own names because they are not the owners of the real property.

The Texas Comptroller's Office also recently filed a request for an opinion from the attorney general questioning whether someone with a leasehold interest in qualified property as defined in Tax Code, chap. 313.021(2) is eligible under chap. 313.025(a) to apply for a limitation on the appraised value of the qualified property. The attorney general's opinion was expected at the end of the summer, but a suit against the Taylor County Commissioners Court resulted in a suspension of the request (RQ-0684) pending the results of the case. The suit, on the question of leasehold interest, was filed on April 28 by a group of landowners who recently lost a nuisance case (*Rankin v. FPL Energy*) against a wind project in that area. The suit claims the commissioner's court did not follow the law when entering into tax abatement agreements with wind energy companies. If the court does not address the issue in the comptroller's request, the attorney general will issue an opinion.

### *Texas Permanent School Fund*

Wind projects on state land require payment of land use fees plus a portion of revenue to the state's Permanent School Fund. Since 1995, the Permanent School Fund has received more than $1 million for Texas schools from wind energy generated on state land.

The Texas General Land Office (GLO) manages state lands and mineral-right properties of more than 20 million acres. Since 2001, the GLO has been evaluating state lands for wind power development for on- and off-shore sites and has identified several counties with potential for wind power development, including off-shore sites in the Gulf of Mexico that could generate millions of dollars for the Permanent School Fund. Recently, Wind Energy Systems Technology, LLC leased land from the GLO for a 150-megawatt wind farm to be located about 7 miles offshore of Galveston Island. This lease is projected to generate a minimum annual royalty payment of $26.5 million for the Permanent School Fund.

## Central Migratory Flyway of North America

Source: TPWD

### *South Texas projects*

Supporters of developing wind energy in the Gulf Coast area have said it is a valuable site because the winds on a coast typically blow at a rate that matches load requirements more closely than in other areas. The Gulf Coast area also offers proximity to the state's electrical grid to carry wind-generated power to customers. Critics of these projects question the potential environmental damage of disrupting migratory bird flyways and otherwise harming waterways, wildlife, and the aesthetics of open space land.

Two large wind generation projects under construction in Kenedy County in South Texas have been highly contested. Babcock and Brown's Gulf Wind project will be a 283-megawatt facility and Iberdrola's (formerly PPM Energy) Penascal project will be a 200-megawatt facility, both on private property. The Coastal Habitat Alliance, which includes the King Ranch, the American Bird Conservancy, the Lower Laguna Madre Foundation, and the Coastal Bend Audubon Society, recently sought a U.S. District Court injunction against the projects, citing irreparable environmental harm to the Laguna Madre and a severe threat to migratory and resident birds. Federal lawsuits have been filed against Texas Land Commissioner Jerry Patterson, PUC commissioners, and project developers, claiming a failure to follow Texas' Coastal Management Program, a regulatory program that requires a permit for the construction of electrical generation facilities within the Texas Coastal Zone. According to the Coastal Habitat Alliance, the state is taking the position that the program was eliminated by the Legislature when the electric industry was deregulated, and their suit argues that the state could not change its regulatory program in the coastal zone once it made the agreement with the federal government and took federal money. The companies have argued that they are private companies developing on private property. Also, they say they have conducted extensive environmental impact studies and consulted with the TPWD and USFWS throughout the process.

## Environmental impacts

Texas has an inexhaustible supply of wind that can be produced without emissions or fuel consumption or the need to mine the land. Although wind energy typically is thought to possess few of the environmental hazards associated with other kinds of power generation, many still express concerns about its potential impact on water, air, and wildlife.

### *Potential Effects on Birds and Bats*

Texas lies within the corridor of the central migratory flyway of North America, which is essentially a wind funnel for migrating songbirds, shorebirds, and raptors. Many birds that breed east of the Rocky Mountains and the Canadian Arctic pass through the area, using the wind funnel to carry them. Wind resources in the region of this migratory corridor are also attracting wind energy development to Texas, specifically along the Gulf Coast and in West Texas and the Panhandle, as well as to other states. Concerns about the dangers to birds and bats from

collisions with wind turbines were triggered in the late 1980s with observations of dead raptors at the Altamont Pass Wind Resource Areas in California. However, fatalities from wind turbines were not reported until the results from a study performed at Kansas State University revealed dead bats around turbines in 2003. In 2004, the first large bat kill was reported at a site in West Virginia.

Bird and bat fatalities have been reported at wind turbines around the country, but little information is available on incidents in Texas, the fastest-growing wind-producing state in the nation and home to 615 species of birds, more than half of them migratory birds. According to the TPWD, most wind turbines are on private property, and owners are not obligated to provide information about an occurrence on their property. The TPWD also is subject to the Public Information Act and so could not protect such information as confidential, increasing the reluctance of owners and developers to provide it. The Association of Fish and Wildlife Agencies has said that

## Mitigating harm to birds and bats

One concern associated with the rapid development of the wind industry has been fatalities of birds and bats caused by collisions with wind turbines. As wind generation facilities are built along the same wind-rich areas that make up the central migratory corridor, concerns about a severe impact on migratory birds and other avian species increase, especially along the coast.

Technology developed for the U.S. Air Force and NASA to prevent hazardous collisions of birds with aircraft is now being used to collect data on bird and bat movements at proposed wind turbine project locations – both on-shore and off-shore. The technology is a bird and bat detection radar system capable of scanning an airfield vertically up to 15,000 feet and horizontally out to 8 miles. This technology also is designed for use in wind-generation facilities as an early warning system that detects migratory birds and bats approaching the airspace of the wind facility. Detection automatically activates a user-programmable mitigation measure, including notifying facility operators or idling the turbines while the birds or bats pass through the air space. The highly contested wind facility in Kenedy County has had this technology for data collection in their pre-construction phase as well as in the current construction phase of the project. The developer of the facility, Babcock and Brown, has said they plan to use the system for early detection when the facility begins operations in late 2008. During periods of peak migration, the system will alert the facility when birds or bats are approaching in low-visibility conditions so that the turbines can be shut down to lessen the likelihood of a collision.

Other recently deployed technologies include a directed, long-range acoustic device to deter approaching birds and bats. This device directs an audible sound, such as a bird distress call, into the air in the direction of the approaching bird or bat. Although the sound is directed upward, it is audible and therefore considered more practical in remote areas.

In addition, features of the turbines themselves may serve to mitigate against potential harm to birds and bats. Modern turbine designs have rotors that move more slowly than earlier designs and do not have areas that allow birds or bats to perch. Also, the Federal Aviation Administration (FAA) requires that all structures more than 200 feet tall have aircraft warning lights. The FAA now recommends using synchronized red strobe lights at wind projects, rather than steady-burning red lights, based on findings of a study funded by the U.S. Department of Energy's National Renewable Energy Laboratory. The steady-burning lights have been shown to attract birds, resulting in collisions, according to the American Wind Energy Association (AWEA). Also, the lights may now be spaced roughly one-half mile apart around the perimeter of a wind generation project. This spacing minimizes the number of lights, which were previously required on each turbine, while allowing a pilot to see and avoid one large obstruction. Lights are not required during the day.

relatively little is known about how to predict mortality events and impacts associated with the degradation or loss of habitat.

The Migratory Bird Treaty Act, enacted in 1918, created a strict liability standard for the taking of any migratory bird, making it illegal to hunt, capture, kill, pursue, shoot, wound, trap, or collect them. In 1972, the law was extended to bald eagles and other birds of prey. Although these are strict liability laws, the U.S. Fish and Wildlife Service has recognized in their recommendations that some birds may be killed by turbines even if all reasonable measures to avoid it are implemented and so has not heavily enforced the laws against those who have made a good faith effort to mitigate harm. While many species potentially affected by wind energy development are under federal protection, others, such as the prairie and sage grouse, mule deer, bighorn sheep, and several species of bats, are not.

With no regulations for either pre- or post-construction, the USFWS and the TPWD have developed recommendations for pre-project risk assessment, project design and operation, post-construction mortality, and adaptive management practices for wind energy development. The TPWD's recommendations are in draft form and were developed through a collaborative effort among the wind industry, non-governmental conservation organizations, and the TPWD. The USFWS interim guidelines to avoid and minimize effects on wildlife from wind turbines also are voluntary. They will be evaluated over a two-year period, then modified as necessary based on their performance in the field and on the latest scientific and technical discoveries.

In October 2007, the U.S. Secretary of the Interior appointed 22 members with varied interests in wind development to the Wind Turbines Guidelines Advisory Committee. The committee was established to provide advice and recommendations to the secretary on developing measures to minimize impacts on wildlife and their habitats from wind energy facilities.

According to the advisory committee, 21 U.S. states have locally developed wind power guidelines or use the federal USFWS guidelines. New York and West Virginia are currently drafting guidelines. Minnesota has laws for siting wind projects. Maine has siting laws for any project in excess of 20 acres, but not specific to wind facilities, and has proposed wildlife guidelines for wind power siting. Most of the state guidelines include preliminary assessment and site evaluation, pre-construction wildlife assessment, site development, retrofitting, repowering and decommission, research, mitigation, and post-construction monitoring.

### *Potential effects on wildlife habitat*

In West Texas and the Panhandle, the greatest potential habitat-related impact to wildlife may not be habitat loss but displacement, which is wildlife avoiding its habitat because of the presence of turbines, turbine noise, and maintenance activities. Grassland bird species, such as the lesser prairie chicken, have demonstrated that they are area-sensitive and prefer larger patches of uninterrupted grassland with few to no trees or tall structures. Several studies indicate that the prairie grouse strongly avoids certain man-made features, such as roads, buildings, and power lines, which can result in habitat fragmentation. Wind generation facilities also may not be compatible with a lek, the traditional courtship display grounds of certain grassland birds. Leks are typically located on elevated or flat grassland sites with few vertical obstructions.

### *Regulation*

HB 2794 by Puente, a bill filed during the 2007 regular session but not enacted, would have set up a permitting process for wind farms by applying the same site-review process to wind electric generation as is applied to cellular communication towers. The site review process would have been developed and overseen by the Texas Commission on Environmental Quality (TCEQ) and the TPWD, with the TCEQ certifying that a site review process had been completed before the PUC issued a certificate of convenience and necessity for construction. HB 2794 died in the Regulated Industries Committee.

Also, some have suggested revising the existing RPS standards to account for environmental impacts and including recommended guidelines in a permitting process. Others have suggested a moratorium on further wind development in Texas until the unknown impacts on the environment can be studied properly.

**Supporters of stricter environmental regulation of the wind energy industry** say that with no negative effects from air emissions or on water quality or usage

once a wind project is operating, the environmental impact of the construction phase often receives little attention. While the effects are relatively slight compared to other sources of energy generation, the equipment and blasting associated with construction of the turbines, building of access roads, and installation of transmission lines could produce air emissions or contaminate water sources with discharge and runoff.

Supporters of regulation argue that virtually every other industrial activity in Texas is permitted by a state agency charged by the Legislature with regulatory oversight, except wind generation facilities. For example, construction of cellular communication towers, most of which are less than 180 feet tall, requires a site review process developed and overseen by TPWD and TCEQ. Wind generation turbines are up to 440 feet high, equal to a 44-story building, and influence the wind flow in an area of about 35 acres. Wind generation can involve construction of several hundred turbines costing $1.5 million each across as much as 200,000 acres. By comparison, the average cost to permit a cellular tower is $4,000 and affects only about one acre of land. A permitting process also would provide landowner protections where the only recourse is litigation through the court system.

**Opponents of stricter environmental regulation of the wind energy industry** have argued that a permitting process would hinder energy production, leading to fewer wind farms and less clean, renewable electricity. One of the qualities that makes Texas attractive to wind developers is that it has no siting requirements. A permitting process could become too restrictive, stifling the industry and making it more difficult to attract and secure the economic development opportunities that have helped to revitalize rural Texas. California, which has strict siting requirements, installed only 63 megawatts of new capacity in 2007, compared to Texas' 1,708 megawatts.

Most wind energy developers, in an effort to be good stewards and good neighbors, already voluntarily work with and follow recommendations from the TPWD and USFWS when siting and operating their projects. An official permitting process would be unnecessary, time-consuming, and costly.

In addition, wind power displaces production from other power plants, which could result in improved air quality. According to the Oak Ridge National Laboratory, 5,000 megawatts of new wind energy will result in statewide emissions reductions of 4 percent for NOx, 4 percent for CO2, and almost 3 percent for SOx. Also, 5,000 megawatts of new wind energy will reduce emissions of CO2 by 9 million tons per year. This could reduce the carbon footprint of every Texan by 750 pounds annually.

### *Noise and visual impairment*

The primary source of local opposition to wind farms has been the noise that the turbines make as the blades rotate, the strobe effect or "flicker" caused by sunlight passing through the moving blades, and the visual obstruction on the horizon.

Courts have ruled consistently that, standing alone, a perceived negative visual impact that a development has on a neighboring property cannot be part of a legal nuisance lawsuit. This is the case even when complaining property owners are concerned that the value of their property will be reduced. Nuisance law addresses only material rights, such as the ability to use and enjoy land, not subjective tastes.

Noise is recognized by the courts as grounds for a nuisance claim. Wind turbines are not silent, but the validity of a nuisance claim is based on whether the sound from an operating wind turbine is sufficiently extreme to substantially interfere with the ability of others nearby to use and enjoy their land.

In *Rankin v. FPL Energy*, a nuisance case in 2006 against a commercial wind energy project, Horse Hollow in Sweetwater, the 42nd District Court in Taylor County ruled that the Horse Hollow wind turbines were not a nuisance to the plaintiffs, two of whom lived 1,800 feet from the nearest turbine. The defendant, FPL Energy, took multiple sound readings of several different noise scenarios and compared them to the sound readings of the turbines in full operation from a half-mile away (2,640 feet). The defendants said their findings showed that properly functioning, fully operational wind turbines produced less noise than crickets and other natural nighttime noises and that the sound in the empty courtroom had a slightly higher decibel reading than fully operational turbines from a half-mile away. The case is pending on appeal.

## Emerging Texas wind law

Development of the law governing the use and ownership of wind in Texas has not kept pace with wind energy development. Attorneys in the industry anticipate that Texas courts eventually will be faced with disputes over property rights, breaches of contract, differing lease interpretations, and contract and warranty claims related to wind energy. Texas has looked to other states for guidance, along with Texas oil and gas law, and related legal theories on the ownership of groundwater and wild animals.

Because the wind literally "flows" over the surface of the land, a wind turbine on one person's property could obstruct the flow of wind over neighboring properties. Under common law, surface landowners have the right to use and develop the empty space above their property, so some have argued that the right to the wind that blows over a property is held by the surface owner of that property. Under the "unified fee theory" of ownership, a landowner owns from the center of the earth to the sky and everything in between.

*Some states have enacted laws to clarify the property rights of landowners in the wind directly over their property.*

Under the "free in nature" theory, wind would be analogous to wild animals, which must be captured in order for a value to be placed on them and ownership established. In Texas, a wild animal is owned by the state until the animal is legally captured and confined by an individual, at which point ownership of the wild animal is transferred to that individual. "Capture" of the wind would be the right to convert or the actual conversion of wind to energy. According to the "free in nature" theory, the state would own the wind until it was legally captured by a landowner.

For groundwater, under the rule of capture, a surface owner may take all of the groundwater that can be captured from beneath the land as long as the use is not malicious or wasteful. If this principle were applied to wind, a landowner would have the right to capture all of the wind that crossed the landowner's property, barring malicious or wasteful use. This would be the case even if the wind were prevented from crossing to a neighboring property, interfering with the neighboring landowner's ability to capture the wind.

The Texas Constitution, Art. 16, sec. 59, declares the preservation and conservation of natural resources to be a public right and duty and permits the Legislature to enact laws appropriate for that purpose. Groundwater is classified as a natural resource and may be regulated by the Texas Legislature. If wind were classified as a natural resource, the Legislature could enact laws governing its capture and use, just as it does for water and other natural resources.

### *Statutes in other states*

Some states have enacted laws to clarify the property rights of landowners in the wind directly over their property. Minnesota, South Dakota, and North Dakota have adopted laws that authorize a property owner to grant a wind easement, which is commonly used in wind energy development to ensure access to the wind and to convey limited rights to use a portion of a landowner's rights. These states also have enacted statutes defining and regulating such wind easements. For example, a wind easement, an option, and a lease of wind rights in these states will be void if no wind energy development has occurred within a certain number of years after the easement is created. Also, South Dakota has prohibited a wind easement from exceeding a term of 50 years, and Minnesota has a similar limit of 30 years on restrictive covenants, which sometimes are used in wind development to restrict land use that could obstruct the developer's wind access.

Texas also lacks developed law and precedent on whether wind rights may be severed from the surface estate and transferred to another party. In California, at least one court has upheld the severance of wind rights. *Contra Costa Water Dist. v. Vaquero Farms, Inc.*, 58 Cal.App. 4th 883 (1997), involved the condemnation of property owned by Vaquero Farms, which had leased a portion of the property for development of a wind farm. When the Contra Costa Water District condemned and acquired part of Vaquero's property, it severed the wind rights and reserved them to Vaquero. Vaquero argued that the wind rights could not be severed from land they no longer owned and that they should be compensated by the water district for the value of the lost wind rights. The Contra Costa County Superior Court in California

decided against Vaquero, declaring that someone could use a wind power right without owning any interest in the land, basing the decision on the notion that wind rights could be bought and sold in the marketplace. The decision was upheld by the California Court of Appeals.

Other states, including North Dakota and South Dakota, have adopted laws that do not allow the severance of a wind interest from the surface estate. The North Dakota law, however, requires that the seller of the surface estate still be allowed to receive payments associated with an existing wind energy project even after the surface estate has been sold.

**Supporters of legislative action on wind as a property right** point out that Texas will be faced with balancing its interests in preserving open spaces and in maximizing the state's wind resources. Sometimes landowners interested in preserving their own and surrounding land seek to buy the wind rights of neighbors in order to prevent the development of wind energy projects. While the Texas Uniform Conservation Easement Act allows a governmental body to acquire property to protect and preserve scenic views or historical property, some question whether an individual who buys wind rights to *prevent* development that could generate electricity should be allowed to do so. Limiting lease terms or how long a piece of property may be held without construction could protect against hoarding by developers who gather property in order to prevent another developer from making use of that property.

Supporters of legislative clarification of the law involving wind energy say that with no statutes in place, the only thing protecting landowners' rights are contractual agreements. It is not always the case that both parties to an agreement have the sophistication or the necessary resources to navigate a legally technical and complicated agreement. Statutory clarifications and restrictions would bring uniformity and continuity to the process, ensure full disclosure, and provide protections through a means other than the court system, which is not always an option for those without the resources to protect themselves.

**Opponents of legislative action on wind as a property right** say that at this early stage in the development of Texas wind energy law, preemptive legislation dictating protocol on property rights, severance, and lease agreements would further obscure an already cloudy issue. It would be better to allow the law to develop over time through industry experience and through the court system. Attorneys advise their clients against severance of wind rights from surface rights, and any statute regulating this may have unintended consequences for existing leases, previous severances, and future wind energy development in the state.

Issues that other states have legislated are being handled contractually in Texas between the interested parties. For example, it is common for a seller of a tract of land to retain the revenue stream associated with an existing wind lease. The buyer purchases the land and all of the wind rights associated with that land subject to an existing lease. North Dakota has legislated this issue, but in Texas this generally is viewed as a contractual matter rather than as a property rights issue. Also, voiding a wind easement, an option, or a lease of wind rights if wind energy development has not occurred on a specific property within a certain number of years would be problematic in Texas because developers do siting studies over multiple years. Limited turbine supply or lack of transmission lines could delay a project several years. Limiting lease terms is unnecessary because most lease terms are 25 to 30 years, which generally is less than what has been proposed legislatively in other states.

***— by Blaire D. Parker***

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