



Nolan County: Case Study of Wind Energy Economic Impacts in Texas

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Nolan County: Texas Wind Energy Economics Case Study

The State of the Wind

Wind energy helped to settle vast stretches of Texas, as the traditional water-pumping windmill opened otherwise forbidding territory to settlement and development. Later, “wind chargers” sprouted up on farms and ranchers until widespread rural electrification displaced the first distributed electricity machines. Utility-scale wind energy turbines arrived in Texas at Fort Davis roughly a century after the military fort was retired from its role of protecting westward expansion. In 1994, West Texas Utilities (later AEP) installed 10 turbines between Fort Davis and Valentine in far west Texas.

The region also is the site for the oldest continuing utility scale project, the 30 MW Delaware Mountains Project and the 35 MW Texas Wind Power Project. McCamey – the Wind Energy Capital of Texas and a pivotal historic icon in the Permian Basin oil region – took the mantle after 2000 and now is home to roughly 750 MW, with substantial projects under construction in the greater Fort Stockton-McCamey area.

Trent Mesa’s 150 MW wind energy center began operations in Nolan County in 2001, marking the entry of the Rolling Plains into world-class wind energy operations. By 2006, Texas had passed California in installed wind energy capacity, and the Lone Star State has not looked back. Both the Public Utility Commission (PUC) and engineers at the Electric Reliability Council of Texas (ERCOT) project that Texas will have more than 10,000 megawatts (MW) (10 gigawatts, or “GW”) installed by the end of 2008. On a global scale, Texas trails only Germany, the U.S., Spain, India, and China in installed wind energy capacity – placing the Lone Star State as the 6th largest “nation” for wind energy operations. With the anticipated transmission upgrades under consideration by the PUC through the Competitive Renewable Energy Zone (CREZ) process, Texas would pass Spain, continue to rival India and China, and would challenge Germany by 2020.

Texas is truly a major global player in the wind energy industry, and the role of Texans goes well beyond the deployment of majestic turbines across the vast wind region. In fact, Texas industrial workers from Brownsville to El Paso, Nacogdoches to Amarillo, Houston to Abilene play a fundamental part in the global supply chain of the wind energy industry. Steel and transportation are leading Texas industries in wind energy, and advanced materials such as carbon fiber are exported from Texas to wind energy companies around the globe. Round Rock is home to the first wind turbine manufacturer in Texas. In a strategic alliance with DeWind, TECO-Westinghouse is manufacturing the DeWind 8.2, a 2.0 MW wind turbine. The Texas transportation industry is fully engaged in the wind energy industry – from all of the state’s deepwater ports to its transcontinental railroads, to specialized trucking operations to hundreds of entrepreneurial pilot car operators.

Within the vast Texas wind energy industry sector, Nolan County has emerged as the most active deployment and operations center for wind energy. The purpose of this study is to detail the economic impacts of wind energy on Sweetwater and Nolan County, as a method of more precisely projecting the potential benefits of the industry throughout Texas as the PUC evaluates robust expansion of the Texas transmission grid and the U.S. Department of Energy assesses bold expansion of the U.S. electric transmission network.

Nolan County Case Study

Executive Summary

Here are some of the findings of our study based on extensive field analysis and interviews:

Applying the seven-fold multiplier principle to the primary direct wind energy base payroll in Nolan County would equate to a 2008 local economic impact of \$ 315,025,200 and a 2009 local economic impact of \$ 396,540,380.

2008 – 1,124 direct wind jobs, payroll in excess of \$ 45,000,000

2009 – 1,330 direct wind jobs, payroll in excess of \$ 56.6 million

Landowner royalties – annual at 2,500 MW installed – \$ 12,264,000, or \$ 17,660,160 annually at 3,600 MW installed by late 2009

Total taxable property values in Nolan County have increased from \$ 500 million in 1999 to \$2.4 Billion in 2008 (projected \$ 3.5 Billion by 2010)

Cumulative wind energy project property taxes paid in Nolan County (including Trent ISD) from 2002 through 2007 = \$30,357,617

Nolan County property taxes paid by wind energy projects in 2007 = \$ 1,724,242

Property taxes paid by wind energy projects to Nolan County schools in 2007 = \$ 12,778,691

Cumulative school property taxes paid 2002 through 2007 in Nolan County by wind energy projects (Sweetwater, Blackwell, Trent, and Highland school districts) = \$ 22,670,680

New school construction in Nolan County school districts (2004 through 2010) = \$ 24,000,000



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Overview

Nolan County in mid 2008 is home to roughly 2,500 MW of operational wind energy, and will exceed 3 GW by early 2009. Together with the adjacent counties of Scurry, Taylor, Mitchell, and Coke, the Sweetwater region is home to well over half of all operational wind energy in Texas and approximately 15 percent of all U.S. wind energy operations.

Nolan County alone has surpassed California in 2008 in installed wind energy capacity, so that **Nolan County would rank as the second largest “state”** for wind energy operations. Like the West Texas region, **Nolan County would count as the world’s sixth largest wind energy “nation”** in a current global ranking.



Nolan County is home to the largest wind energy projects in the U.S. and indeed the world. FPL Energy’s Horse Hollow ranks as the world’s largest wind energy center at 750 MW in Nolan and Taylor counties. Babcock & Brown’s Sweetwater Wind Energy Center (all within Nolan County) is the second largest project in the U.S. at just under 600 MW. AES Wind Generation’s Buffalo Gap Project (Nolan and Taylor counties) is poised to overtake Babcock & Brown’s Sweetwater Wind, as Buffalo Gap phases 4-5-6 come on line in 2008 and 2009. The Buffalo Gap & Sweetwater projects are also being challenged by FPL Energy’s Capricorn Ridge-Goat Mountain in adjacent Coke and Sterling counties. Sweetwater, Buffalo Gap, and Capricorn Ridge are all three competing for the title of second largest U.S. wind project, each in the 600 MW range.

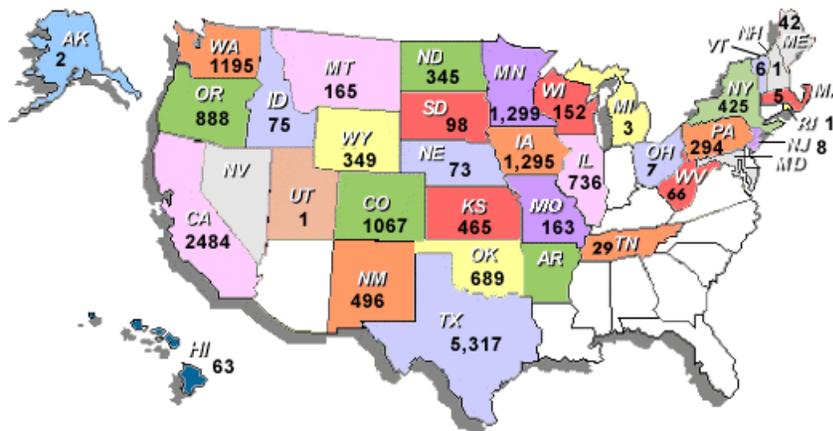
Looming above all these is the emerging E.on complex of projects in Nolan, Mitchell, and Scurry counties. Initially developed by Airtricity, the four contiguous projects are centered on the town of Roscoe in Nolan County and will top out at roughly 1,000 MW – the world’s first 1 GW wind energy center – in late 2008 or early 2009. The component Roscoe and Champion projects are fully operational, while the Inadale and Pyron phases are in the advanced construction stage as of mid 2008. E.on is the largest utility in Germany.

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As Nolan County projects relinquish the titles of “largest in the world” and “largest in the USA”, these titles will be taken over by other regions of Texas, as 3 GW+ projects have been announced for diverse areas such as Pampa, Silverton, Laredo, and more. Nolan County is a learning laboratory for each of the several 3 GW+ regions that will emerge across Texas as the transmission network becomes more robust – both within and in addition to the CREZ process. Career opportunities, operations centers, manufacturing, infrastructure needs, and other demonstrable beneficial impacts of the Nolan County experience will be seen again and again across the Lone Star State. As McCamey learned from California and Sweetwater learned from McCamey, emerging wind centers across Texas will learn from the Nolan County model. Community economic development planning will be refined from the Nolan County model, as larger single projects and longer lead times will enable more sophisticated coordination between communities, project owners, and wind construction and operations companies.

Nolan County is further useful as a generic economic impact analysis locale because its multiple projects have evolved over almost a decade with diverse developers bringing the region’s wind energy operations to fruition across many sets of economic circumstances. Construction of Trent Mesa began in 2000, and Nolan County by 2009 will be home to more than 15 wind energy projects controlled by at least seven different wind energy developers. Even within this broad definition of “owners”, there are many more ownership group complexities, and some of the largest acquisitions and divestitures in the global wind energy industry have involved changes of control in Nolan County wind projects.

In addition to Nolan County’s intensity of current operations, the county has more than 1,000 MW of new projects under construction for 2008 completion. To put the level of wind project construction in Nolan County into perspective, only the **total existing wind operations** in each of Texas, California, Minnesota, Iowa, Washington, and Colorado outrank the wind projects **under construction in Nolan County**. That is, the wind projects **under construction in Nolan County would alone rank as the 7th largest state for wind energy**.



Data & graphics source: American Wind Energy Association

Nolan County features several types of turbine technology, which also assure that Nolan County’s experience can be broadly applied, as it is not skewed by exclusive use of any single technology. Nolan County wind projects feature GE Wind 1.5 MW turbines, Siemens 2.3 MW, Mitsubishi 1.0 MW, Vestas 1.8 MW, and DeWind 2.0 MW. The world’s largest commercially deployed turbines – the 3.0 MW Vestas V90 on 105-meter towers – stand in adjacent Scurry County.

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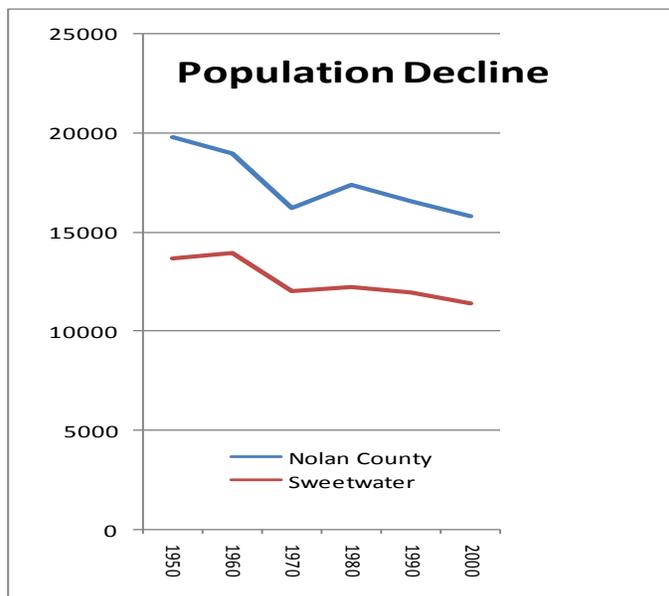
DeWind has installed its North American 2.0 MW prototype at the Sweetwater Wind Energy Engineering Technology (SWEET) Center near Highland in Nolan County. The SWEET Center is a cooperative enterprise of the City of Sweetwater and Texas State Technical College West Texas. The City of Sweetwater provides the land for turbine prototype testing and other energy innovation research undertaken by TSTC, other academic institutions, and wind energy companies. TSTC owns the DeWind turbine as part of the college's premier wind energy turbine technology degree and certificate programs. TSTC's wind turbine technology programs are conducted on and from the college's Sweetwater campus.

Nolan County was formed in 1876 and locally organized in 1881 with the arrival of the Texas & Pacific Railway. Midway between the Atlantic and Pacific oceans, Nolan County's role as Midway USA is solidified by the intersection of Union Pacific (successor to the T&P) and the Burlington Northern Santa Fe (BNSF) railroads, as well as its central point on east-west Interstate 20. The diverse economy is founded on transportation (rail, trucking, and air), building materials manufacturing (gypsum wallboard and Portland cement), agriculture (predominantly cattle and cotton), energy (oil & gas, wind, nuclear, and coal), education, health care, tourism, and retail.

Like virtually all of West Texas, Sweetwater and Nolan County had seen consistent, significant population losses since 1950. High school graduating classes at Sweetwater had shrunk from the 200 range in the 1970s to 90 in 2005.



Population in Nolan County declined 20 percent from 1950 (population 19,808) to 2000 (population 15,802). Likewise, Sweetwater's population declined 16 percent from 13,619 in 1950 to 11,415 in the 2000 U.S. Census. Sweetwater's official population peaked in 1960 at 13,914, and had declined by 22 percent to the 2000 Census level.



The U.S. Census estimated that 21.7 percent of Nolan County residents had income below the poverty line in 1999 (compared to a rate of 15.4 percent for Texas as a whole). Federal estimates indicated that 10.7 percent of Nolan County residents had incomes below 50 percent of the poverty level in 1999 (compared to a state average of 6.7 percent).

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Landowner royalties

At the heart of every wind energy operation in Texas is a private transaction, whereby a private wind energy developer negotiates a land use agreement with a landowner – in Nolan County, these are private family ranchers and farmers for the most part.

In Texas, ranchers and farmers are typically paid the higher of (a) an agreed percentage royalty, or (b) a minimum guaranteed payment. **Nolan County landowners who have leased their land for wind energy development receive an estimated \$ 12,264,000 annually in royalty payments from wind energy operations.**



This figure is derived from 2500 MW of operational wind energy in Nolan County, a 35 percent operational capacity factor, a \$40/MWh wholesale energy price, and a four percent royalty. Actual terms of virtually all wind energy lease contracts are confidential by their terms. However, the underlying assumptions used in this equation are reasonable.

The wholesale price of \$40/MWh is a reasonable mid-range market price. Some earlier projects (e.g., pre-2004) may have a lower long-term sales price under their power purchase agreements. On the other hand, a substantial portion of Nolan County wind energy projects are sold into the spot market on a “merchant” basis, often bringing significantly higher prices than long-term power purchase agreements.

Royalty percentages are negotiated between the wind project developer and the landowner. Earlier lease agreements (e.g., pre-2004) may have royalty percentages lower than four percent, while most recent lease agreements have royalty percentages in excess of four percent.

A capacity factor of 35 percent is an accepted norm for Rolling Plains wind energy projects.

Applying these same underlying assumptions to the current 6,000 MW of wind energy operations in Texas would yield an annual royalty payment stream of \$29,433,600 to ranchers, farmers and institutional landowners across Texas. PUC and ERCOT officials project 10,000 MW installed in Texas by year-end 2008 – thus yielding an estimated \$50 million to Texas farmers and ranchers. Some transmission expansion scenarios under consideration by the PUC would double the total MW of wind energy installed in Texas, making it possible for Texas farmers and ranchers to receive in excess of \$100,000,000 annually in wind energy royalties. Given that much of that new wind energy would be in the Texas Panhandle and South Plains (with wind capacity factors approaching 45 percent, rather than the 35 percent common in the Rolling Plains area), \$100 million in annual royalties understates agricultural income in the most robust PUC scenarios.



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Direct employment

Total employment impacts

Wind energy jobs are now among the largest employers in Nolan County. The employment and payroll totals in this section include only direct wind energy jobs. Ancillary economic impacts and potential multiplier effects are presented elsewhere in this study.

Within Nolan County's projected 14,878 residents (U.S. Census 2005 estimate), there are approximately 1,124 direct jobs in the wind energy industry as of mid 2008. Local employers project that they will have roughly 1,330 direct wind energy jobs in 2009.



The direct wind energy payroll in Nolan County exceeds \$45,000,000 in 2008, and the 2009 projection based on wind employer interviews will exceed \$56,600,000. These payroll totals are conservative. Payroll totals reported in this study take a mid-range wage level estimated by each employer, assume a straight 40-hour week (despite actual extensive overtime pay throughout the industry), and do not count per diem payments that regularly exceed \$100 per day (i.e., \$3,000 per month and \$36,000 per year) per employee for many operations and construction companies. The payroll totals presented in this study also do not estimate the monetary implications of any workplace benefit packages received by the wind energy workers.

Note that the U.S. Census estimated Nolan County's total personal income in 2004 to be \$368,670,000, so that the 2009 projected \$56,600,000+ in direct wind energy salaries would be equivalent to roughly 15 percent of total personal income for residents of Nolan County only five years earlier.

With a 2008 base payroll of \$45,000,000, the direct wind energy jobs in Nolan County have an average annual salary of \$40,038 (excluding overtime, per diem, and benefits), while federal estimates showed the average wage per job in Nolan County in 2003 to be \$24,710. Thus, base salary for current wind energy jobs represent more than a 60 percent increase over average salaries in the county only five years earlier, and anticipated 2009 payroll (average \$42,593) will be 70 percent over 2003. By comparison, the estimated median household income in Texas in 2005 was \$42,139, while Nolan County lagged at \$27,661.

The U.S. Census also estimated in 2003 that there were 6,370 jobs in Nolan County, so that the projected 1,124 direct wind jobs in 2008 would be 18 percent of the county's total job base only five years earlier. The projected 1,330 direct wind jobs in 2009 would be equivalent to roughly 21 percent of the total available jobs in the county in 2003.

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Operations & Maintenance employment

Permanent wind project operations jobs account for roughly 29 percent of all direct wind energy jobs in Nolan County in 2008 (324 jobs out of roughly 1,124). Wind employers estimate that permanent jobs will exceed 36 percent of all direct wind energy jobs in Nolan County in 2009 (480 jobs out of a projected 1,330).

A general industry “rule of thumb” in the wind sector has been that there is one job for every 10-12 “towers”. In fact, once a community reaches critical mass as an operations center of the 3 GW class (as Nolan County has and several others Texas communities will before 2015), the actual results are much more dramatic. Nolan County in mid 2008 has 1,057 wind towers and approximately 324 permanent wind operations workers, a ratio of 1:3.26. The 2009 projections are 1,572 towers and 480 permanent workers, for a “towers to jobs” ratio of 1:3.28. That is, for both 2008 reality and 2009 employer projection, the actual situation is that there is one permanent operations job for roughly every three turbines. On a megawatt basis, in mid 2008 there is one permanent job for every 7.2 MW (324 operations jobs and 2,500 MW), and in 2009, employers project one permanent job for approximately every 7.5 MW (480 jobs and as much as 3,608 MW in Nolan County).

The operations jobs per MW ratio in Nolan County in both 2008 and 2009 is 0.13 jobs per MW, so that 133 jobs would be expected per 1,000 MW and 13 jobs per 100 MW project. As megawatts in a wind region decrease, however, the expectation of 133 permanent jobs per 1 GW will decline for isolated projects in the 100 MW range. That is, the “wind center” critical mass effects that are demonstrated in the Nolan County case study can be expected to hold for other wind centers of the 3 GW class, but for wind energy projects of, say, 100 MW that are 100 miles or 250 miles or more from any other wind energy activity, employment expectations would return to the pre-existing industry expectation of 1 job per 10 or 12 wind towers. Even this decrease, however, still would provide for 8 to 10 permanent operations jobs for an isolated 100 MW wind project. Jobs assigned to isolated projects, though, will become more likely to be dispatched from a wind center as the prevalence of 3 GW operations regions expands across Texas and the Great Plains.



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It is important to note that this Nolan County case study of wind energy direct permanent jobs does not include such professional categories as lawyers, paralegals, accountants, abstract companies, and others who are, in fact, devoting a substantial portion of their annual workloads to wind energy development and operations. Likewise, workforce at new and existing hotels, restaurants, convenience stores, and the like are not included in “wind workforce” and payroll calculations. The multiplier effect of direct wind energy payrolls is presented below as a representation of these beneficial impacts of the wind energy industry.

Construction & Commissioning employment

Construction and commissioning are major employment components of the wind energy industry. Although some have been tempted to deride wind energy construction jobs as “temporary”, significant wind energy construction began in Nolan County in 2000 and is projected to continue intensively within Nolan County through at least 2010. Adjacent counties have seen extremely active construction since 2003 (Scurry) and 2005 (Taylor). Taylor County, for example, had one wind turbine at the beginning of 2005 and now ranks among the Top Ten “states” for wind energy installed capacity. Adjacent Mitchell County had zero wind turbines until 2007 and will be home to more than 1 GW by 2009. Construction throughout West Texas will intensify as southwest Texas, the Permian Basin, South Plains, Panhandle, and other areas move Texas toward the 25,000 MW threshold by 2015. Other Great Plains states will then likely begin to intensify wind energy development. In short, wind energy construction in West Texas and later, *from* West Texas will continue to be a major employment opportunity for West Texans through at least 2030 (note the Bush Administration study on “20% by 2030” projecting 300,000 MW of wind energy operations from the Great Plains in roughly 20 years).

Interviews with highly experienced wind energy leaders conservatively estimate that there are at least 800 construction workers engaged in the five major wind energy construction project areas currently active in Nolan County: more than 1,000 MW at the Turkey Track, Buffalo Gap 4-5-6, South Trent, Inadale, and Pyron sites. Continued construction in and adjacent to Nolan County – as well as final commissioning of the 2008-2009 Nolan County projects – will mean a projected 850 construction and commissioning jobs (conservatively) in Nolan County in 2009.



Experience with large-scale wind energy construction projects in West Texas since 2001 demonstrates consistently that as many as 300 workers are mobilized during the construction phase of each large-scale project (i.e., 100 MW to 300 MW). Using that 300-worker standard, the five large-scale projects underway in Nolan County in mid 2008 would be expected to mobilize 1,500 workers. This study uses 50 percent of that expectation as an estimate of direct wind energy construction employment at any point, thus 150 workers for each of five major projects underway equals 750 construction workers.

This study also classified Nolan County-based wind energy transportation jobs as “construction” related and therefore “temporary”. Among these jobs are specialized heavy trucking and pilot car entrepreneurs. For example, moving in a single crane for construction operations can actually require

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dozens of “18 wheelers” (in fact, the huge components required for wind turbines and cranes capable of 300-400’ tower erections rarely arrive on traditional “18 wheelers” and instead require much larger and more complex truck-trailer combinations). Interviews with experienced wind energy trucking companies and pilot car entrepreneurs project roughly 50 wind energy transportation jobs are present at any point in Nolan County in 2008 and 2009. Adding these 50 transportation jobs to the 750 on-site construction jobs provides the 800 construction jobs estimated for 2008. Commissioning and other refinement of initial operations for the late 2008 and early 2009 new projects will add an additional 50 projected jobs in the construction and commissioning category for 2009.

Like site construction jobs, pilot car operations have been active in Nolan County since 2000, and the intensity of development in the area has led to a concentration of the pilot car operations in the Sweetwater area. It is anticipated that many of the operations will continue to headquarter in Sweetwater, even as construction migrates to other areas of West Texas, South Texas, and the Great Plains. Sweetwater would continue to benefit from its central location in the U.S. east-west highway corridor, at a crucial transcontinental rail intersection, and as a transit point between the Texas ports and the wind industry’s expansion into the Great Plains



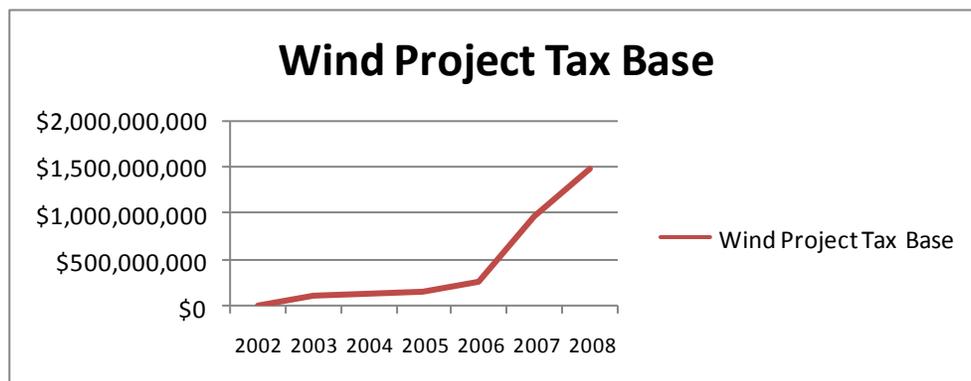
Wind Energy Payroll Benefit to Local Economy

Primary payroll dollars have a reverberating effect throughout the local economy. Economic impact analyses traditionally estimate that primary payroll dollars have a seven-fold impact. Applying the seven-fold multiplier principle to the primary direct wind energy base payroll in Nolan County would equate to a 2008 local economic impact of \$315,025,200 and a 2009 local economic impact of \$396,540,380.

Property tax revenue

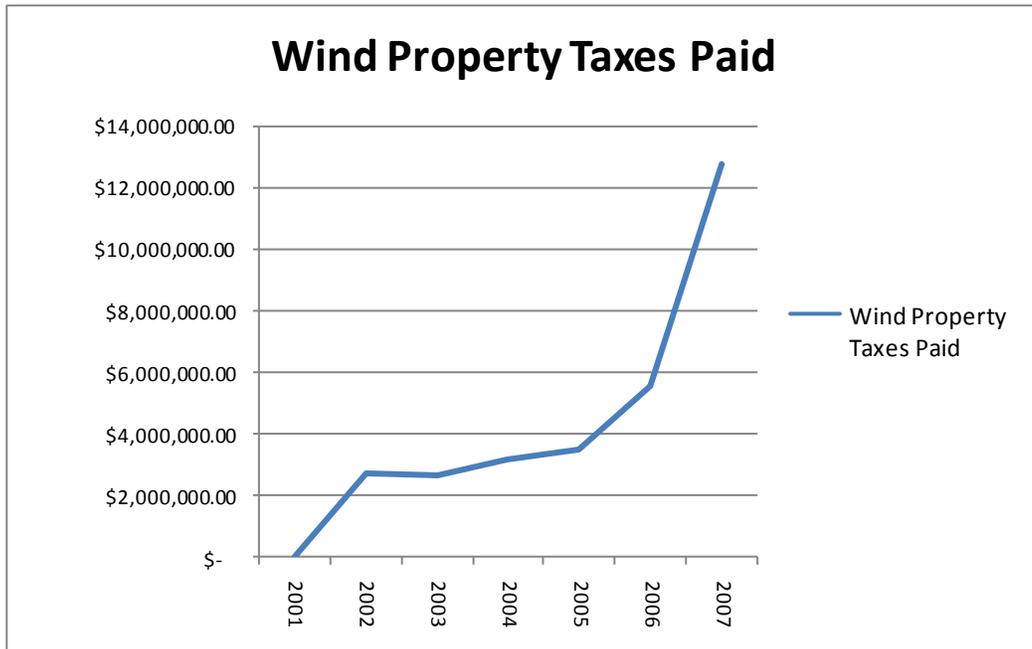
Tax base enhancement

In 1999, Nolan County had a total property tax base of roughly \$500,000,000, or \$0.5 Billion. Preliminary estimates from the Nolan County Central Appraisal District project the 2008 total taxable value for Nolan County to be in excess of \$2.4 Billion. This is almost a fivefold increase in total taxable value in the county in less than 10 years and a 50 percent increase in just one year: 2007 total taxable value was roughly \$1.6 Billion. Many currently operational projects were not fully operational by January 1, 2008 (and thus were not yet appraised at full value), and well over 1,000 MW is under current active construction (roughly a 50 percent increase over January 1, 2008 levels), so that it is reasonable to anticipate that wind energy investment already in the pipeline could add as much as another billion dollars to Nolan County tax rolls by 2010 (i.e., accumulating to an approximately \$3.5 Billion total taxable value, or almost a seven-fold increase in a decade).



Wind-influenced ancillary development is also anticipated in the 2010-2012 timeframe, as a \$300 million investment is anticipated to upgrade a Nolan County portland cement manufacturing plant to become the world's most energy efficient. Although virtually all product from the Nolan County facility was exported out of the county for most its 57-year history, almost all of the product currently stays in Nolan County and West Texas to create foundations for wind turbines. The projected growth of the wind energy industry over coming decades in West Texas and the Great Plains has played a fundamental role in the upgrade plan.

Wind energy projects were not on the Nolan County tax rolls until 2002. **From 2002 through 2007, wind energy projects paid in excess of \$30 million in property taxes in Nolan County to school districts, County of Nolan, and other jurisdictions.**



These property tax receipts reflect payments received from Trent Mesa, Sweetwater, Buffalo Gap, and Horse Hollow only, and only as to those projects elements placed in service on or before January 1, 2007. **Due to customary lags between preparation of county tax rolls and commissioning of wind energy projects, property tax receipts in Nolan County to date include no tax revenues from wind energy projects at Champion, Roscoe, Inadale, Pyron, Turkey Track, South Trent, or any post-2006 additions at pre-existing wind energy projects.** Such revenues will be reflected in future tax years.

County property taxes

Nolan County's first wind project (Trent Mesa) became operational in 2001. **From 2002 through 2007, the County of Nolan has received approximately \$4.8 million in property tax payments from wind energy projects within the county boundaries.**

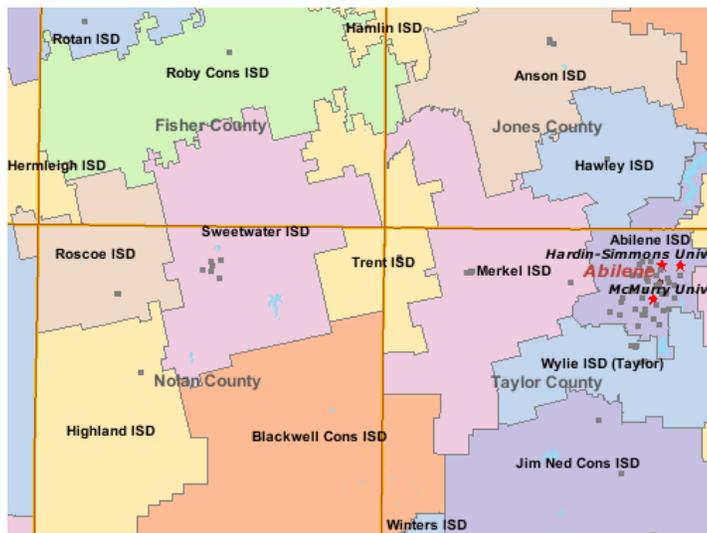
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School property taxes

The following school districts are located wholly or substantially within Nolan County: Sweetwater, Roscoe, Blackwell, Highland, and Trent. All of these school districts currently have substantial wind energy projects within their boundaries. However, due to time lag between project commissioning and preparation of annual tax rolls, several wind energy projects are not yet reflected in taxable value within these districts as of mid 2008.

From 2002 through 2007, wind energy companies paid almost \$23 million in school property taxes to Nolan County school districts. A substantial portion of this local taxation has been subject to recapture by the State of Texas for redistribution to non-Nolan County school districts under the Texas school finance system.

It is important to acknowledge the rapid expansion of the wind energy projects across school district boundaries and the time lag between commencement of project operations and the finalization of district tax rolls by local central appraisal districts, as well as the roles of both the Texas Comptroller of Public Accounts and the Texas Education Agency. **These property tax receipts reflect payments received from Trent Mesa, Sweetwater, Buffalo Gap, and Horse Hollow only, and only as to those projects elements placed in service on or before January 1, 2007. Due to customary lags between preparation of county tax rolls and commissioning of wind energy projects, property tax receipts in Nolan County to date include no tax revenues from wind energy projects at Champion, Roscoe, Inadale, Pyron, Turkey Track, South Trent, or any post-2006 additions at pre-existing wind energy projects.** Such revenues will be reflected in future tax years.



These time lags are reflected in the fact that Nolan County school property tax receipts from wind energy projects were almost \$13,000,000 in 2007 alone – well over half of the total of \$23 million collected from 2002 through 2007. Again, the bulk of these funds are recaptured by the State of Texas for redistribution to property-poor school districts outside of the wind region.

Other school districts in the wind region are not yet reflected in wind energy property tax receipts. For example, the Roscoe ISD is now the primary home to the 1 GW complex of wind energy projects developed by Airtricity and E.on, but to date Roscoe ISD has received no wind energy property tax income, as none of the Airtricity/E.on projects in Nolan County have yet come onto tax rolls because of the lag between project operations and setting of the tax rolls. These E.on projects near Roscoe are also in other school districts, as well, such as Highland, Colorado, Loraine, and others.



School construction 2004-2010

Although the bulk of maintenance and operations (“M&O”) taxes paid by Nolan County taxpayers for public school purposes are recaptured by the State of Texas for redistribution to property-poor school districts under the Texas public school finance system, Nolan County school districts have limited opportunities for important capital expenditure upgrades. By accessing these opportunities, Nolan County schools have experienced roughly \$24 million in new school construction substantially financed by wind energy project revenues since 2004 and already programmed through 2010. State-of-the-art facilities are taking shape at Trent, Blackwell, and Highland.



Prior to occupying their new school in 2005, Trent ISD students attended classes in buildings that were up to almost 125 years old – dating to the arrival of the Texas & Pacific Railway in 1881. Trent students now occupy a cutting-edge campus as a result of a \$4.5 million construction project substantially completed in 2005. Trent students now have a learning environment appropriate to the 21st century, including an efficient school layout and the latest in technological opportunities. AEP’s Trent Mesa wind energy center is located substantially within the Trent ISD boundaries, and Babcock & Brown’s South Trent wind energy center will be completed in 2008. Trent ISD experienced almost a 50 percent enrollment increase in its first year on the new campus.



Blackwell CISD is a combination of the Blackwell and Divide school districts. Divide’s school closed in 1985 due to a dramatic drop in oil values and declining population in rural Nolan County. At Blackwell’s current school, the “new” gym dates to 1940. The main core of the Blackwell school complex was built in 1923. Blackwell CISD is now in active construction of its new \$ 11.5 million school complex, made possible in large part by the arrival of the wind energy industry. Blackwell ISD is home to all or part of several major wind energy projects, including Babcock & Brown’s Sweetwater, FPL Energy’s Horse Hollow, and AES Wind Generation’s Buffalo Gap. Blackwell now has the capability to offer enhanced educational programs (such as physics and trigonometry), the latest technological advances (such as Smart Boards), and competitive student programming in math and sciences. The new Blackwell school will feature an improved computer learning lab, an auditorium, and many other student academic opportunities that were unimaginable just five years ago. Like the rest of the wind region, Blackwell CISD has already experienced a significant increase in student enrollment. Blackwell CISD will also power a substantial part of its campus energy needs and control its energy costs with the district’s own wind turbine.

Highland ISD starts construction in August 2008 on its new \$ 8 million campus. Highland’s school district boundaries include Babcock & Brown’s Sweetwater wind energy center and E.on’s Champion Wind Project. Established in 1937, Highland will use its more expansive facilities to provide better facilities to its growing student population and continue its tradition of excellence. The vibrant Highland student body continues to grow as wind energy operations expand in western Nolan County.

Ancillary economic impact indicators

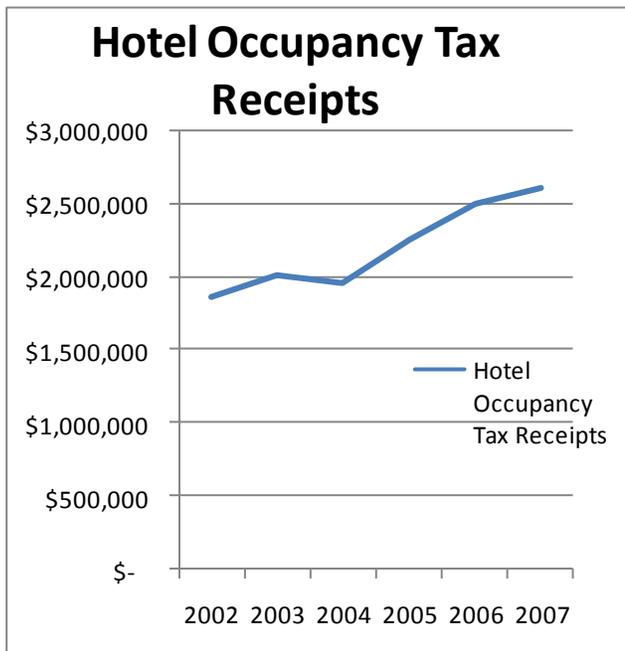
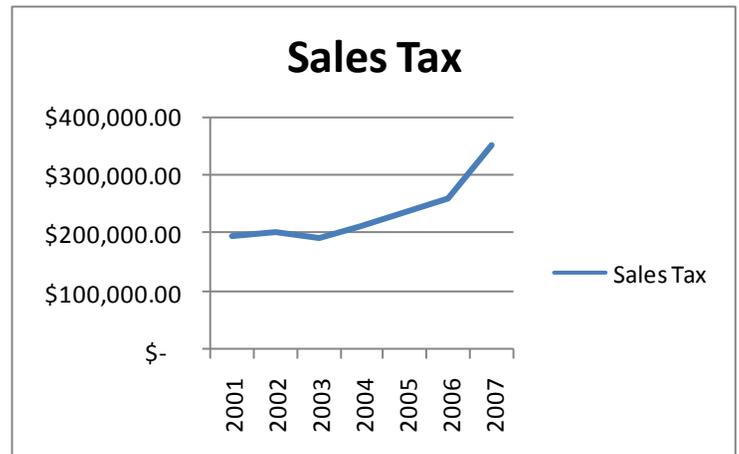
Certain other statistical observations demonstrate the broader health of the local economy since the advent of the wind energy industry in Nolan County. Among these are building permits, sales tax revenue, and hotel occupancy tax receipts.

Building permits

Within Sweetwater, in 2001 building permits were issued for a total of \$ 1,590,863 in new construction or property rehabilitation. In the following six years (since commencement of operations at Trent Mesa), building permits in Sweetwater were issued for a total of \$24,839,535, an annual average in excess of \$ 4.1 million per year over the six-year period from 2002 through 2007. Building permit values in 2007 marked a 192 percent increase over permit values for 2001.

Sales Tax revenue

Sales tax revenues in Sweetwater have increased 40 percent over the period 2002-2007, from \$1,860,696 to \$2,605,560. From January 2008 through June 2008, Sweetwater sales tax income is \$1,447,232, an increase of 11.54 percent over the first six months of 2007. Substantial new retail operations and dining options have opened in Sweetwater, particularly at the primary interstate 20 commercial exit, since 2004. Intensified industrial service operations will add additional momentum to local sales tax revenues in the near future.



Hotel occupancy tax revenue

Sweetwater has experienced an 81 percent increase in hotel occupancy tax revenues from 2001-2007, as a substantial number of the wind energy company personnel stay in local hotels and motels for extended periods. In fiscal 2001, occupancy tax receipts were \$194,932, and this number had increased to \$352,142 by fiscal 2007. Occupancy tax revenues in fiscal 2008 are projected at \$400,000. Since 2005, Sweetwater motel space has increased by 43 percent, from 392 rooms to 560 rooms. At least two more hotel properties are currently scheduled for construction in 2008-2009. The latest operational hotel – Best Western Sweetwater Inn & Suites – opened in 2008 and had a construction cost of \$2.5 million.



Pollution avoidance benefits

Opportunities for emission reductions from CREZ development are substantial. Based on the ERCOT-specific emissions reduction analysis by General Electric reported in the 2008 ERCOT Ancillary Services Study, 15,000 MW of wind, if installed on the ERCOT system in 2008 would reduce NOx emissions by 12% and reduce carbon emissions by 15%. **Extrapolating these results to the current Nolan County installed wind energy capacity of 2,500 MW alone results in a 2.0 percent reduction in NOx and 2.5 percent reduction in CO2 for all of ERCOT.**

Energy Cost Savings Benefits

Testimony submitted in the PUC Docket by Public Citizen includes an LBL study showing energy costs savings for every megawatt-hour (MWh) of wind energy produced. As Public Citizen's filing noted: "The less fuel we use, the less energy prices will rise. Decreased demand will put downward pressure on prices. There is substantial evidence that more wind power will reduce natural gas prices by softening price pressure and reducing prices. A summary of studies by LBL [Lawrence Berkeley Laboratory] finds that \$7.50 to \$20 benefit for every MWh of wind power added to the system. "

Using that cost-saving range, Nolan County wind energy (assuming 2,500 MW at 35 percent capacity factor) would produce an annual energy cost savings between \$57,487,500 and \$153,300,000.

Methodology

Operations jobs statistics for 2008 and 2009 are based on on-site interviews with approximately 20 wind energy businesses with permanent operations in Nolan County. Construction job numbers are based on interviews with wind energy leaders (major wind project owners and others) within Nolan County. Property tax revenue statistics are based on data prepared by the Nolan County Central Appraisal District, the Taylor County Central Appraisal District (as to Trent ISD), and on-site interviews with senior officials at Nolan County, Sweetwater ISD, Trent ISD, Blackwell ISD, Highland ISD, and Roscoe ISD. Sales tax revenues and hotel occupancy revenue figures are derived from the Comptroller of Public Accounts and the City of Sweetwater. Building permit data has been provided by the City of Sweetwater. Additional economic data has been supplied by the Sweetwater Enterprise for Economic Development and the Sweetwater Chamber of Commerce.

The following wind energy operations companies in Nolan County were consulted to obtain 2008 actual and 2009 projected direct wind job totals: GE Wind, AES Wind Generation, AEP Trent Mesa, Babcock & Brown, FPL Energy, E.on, Altezza, Upwind Solutions, Northwind Solutions, Wind Energy Services, Wind Energy Turbine Services, Invenergy, Advance Turbine Services, Third Planet Windpower, Hytorc, New Amsterdam Wind Source LLC, Crane Service Inc., Lone Star Pilot Cars, and the West Texas Wind Energy Consortium.



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School boundary mapped from Texas Education Agency district locator at www.tea.state.tx.us.



