NOTE & COMMENT

SOCIAL AND REGULATORY CONTROL OF WIND ENERGY—AN EMPIRICAL SURVEY OF TEXAS AND KANSAS

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I. INTRODUCTION

This article seeks to present an informal, empirical survey of wind development in Texas and Kansas. It focuses on current practices in these two states—both fortunate to be rich in potential wind resources[1]—by exploring the social and regulatory controls of wind development from the perspective of active participants. In the overview, a simplified model is introduced to explain the components of wind production and build a background for subsequent interviews with landowners, developers, utility executives, and others working with wind in Texas and Kansas. The interviews, in turn, illustrate how social and regulatory opinions necessarily forge the shape of wind energy expansion. In the final subpart, one prescription is offered for managing future development.

A number of trends indicate this may be an opportune time for an informal empirical survey: wind energy is featured prominently in the news,[2] is a target of large-scale investment,[3] and appears to be a burgeoning area for practicing lawyers.[4] Even with this rush of activity, the generation of energy from wind is still in its beginning stages of implementation. Surveying the collective experience of individuals working in Texas and Kansas provides a benchmark for development in states where wind energy is being deployed.

II. WIND POWER OVERVIEW

A. The Wind Triangle

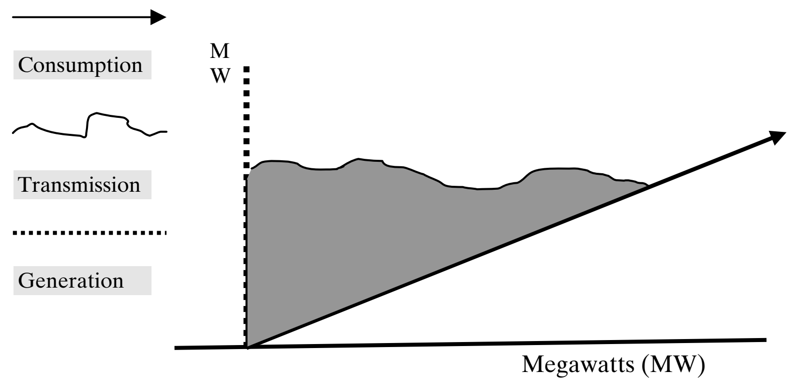
Abstractly, the production of wind power is a balance between three components: generation, transmission, and consumption. In the schematic below, generation is represented as a vertical line. The line is dashed to show intermittency—sometimes the wind is not blowing and no

1. A widely cited study ranks Texas second, and Kansas third, in available wind resources (North Dakota is ranked number one). *See* PAC. NW. LAB., AN ASSESSMENT OF THE AVAILABLE WINDY LAND AREA AND WIND ENERGY POTENTIAL IN THE CONTIGUOUS UNITED STATES (1991) [hereinafter PNL Assessment].

2. *See, e.g,.* Yuliya Chernova, *Change in the Air*, WALL ST. J., Feb. 11, 2008, at R10; Clifford Krauss, *Move Over, Oil, There's Money in Texas Wind*, N. Y. TIMES, Feb. 23, 2008, at A1; Geoff Manaugh, *Off the Grid*, DWELL, Mar. 4, 2008, at 80.

3. *See, e.g.,* Ruthie Ackerman, *Wind Sees Green*, FORBES.COM, July 1, 2008, http://www.forbes.com/markets/2008/07/01/wind-energy-closer-markets-comm-cx_ra_0701 markets43.html; *Pickens' Mesa Power Orders GE Wind Turbines*, REUTERS, May 15, 2008 (discussing a $2 billion, 667 wind turbine order, part of a planned $10 billion investment in a Texas wind farm), http://www.reuters.com/article/newsOne/idUSWNAS427320080515.

4. The University of Texas Continuing Legal Education's Wind Energy Institute, for example, has grown steadily since its inaugural year: 2006 = 140 registrants, 2007 = 375 registrants, 2008 = 444 registrants. Many of these registrants are lawyers, although the data is not segregated. E-mail from Hollis Levy, Assoc. Dir., Univ. of Tex. Continuing Legal Educ., to Ryan Trahan, Author (Mar. 17, 2008, 5:58:29 CDT) (on file with author).



power can be generated. Consumption is shown as the arrowed line extending towards the horizon indicating slow, steady, and, thus far, unending growth. The squiggled line represents transmission. It is more or less a steady ceiling on the amount of energy that can be consumed. The line representing transmission line is not straight because, among other things, the capacity of the conductors (transmission lines) fluctuates somewhat according to changes in weather conditions and temperature. The area in gray represents the total wind triangle of generated, transmitted, and consumed energy. This simplified schematic accurately portrays the relationship between the component parts of wind energy management in two converse ways: (1) it shows that each of the three segments is independent, i.e., any of these three variables can be independently increased or decreased, and (2) the total wind triangle—of generated, transmitted, and consumed energy—is entirely interdependent. For example, the line representing generation in the schematic could be extended even higher to show an increased number of wind turbines being built; however, this increase would not result in a change in the total wind triangle without a concurrent expansion in transmission capacity. Although any of the three components can constrain the system, the schematic is accurate in showing that a lack of transmission is currently the leading bottleneck.

1. Generation

In 2007 the United States generated nearly 1% of its electricity supply from wind power,[5] or roughly enough electricity to power an equivalent

5. ENERGY INFO. ADMIN., MONTHLY ENERGY REVIEW TABLE 7.2B (Oct. 2008), *available at* http://www.eia.doe.gov/emeu/mer/pdf/pages/sec7_6.pdf. Table 7.2B provides for a quick historical comparison: in 2006 total electricity generation in the U.S. was about 3,908,077 million kWh, of which wind contributed 26,589 million kWh, or a little over one-half of 1%. The output in 2006 was a considerable increase from 2001, when wind contributed less than one-fifth of 1% of total electricity generation and about one-fourth as much electricity as in 2006 (6,737 million kWh). *See also* AM. WIND ENERGY ASS'N, AWEA 2007 MARKET REPORT (2007), *available at* http://www.awea.org/projects/pdf/Market_Report_Jan08.pdf [hereinafter AWEA 2007 MARKET REPORT]. As of the time of this article, it was estimated that another 7,500 MW of capacity will

of 4.5 million U.S. households.[6] This level of generation significantly trails the world's leading wind-producing countries on a percentage-of-production basis.[7] The U.S., however, leads in incremental capacity added (45% increase in 2007) and ranks second only to Germany in total capacity.[8] In short, the potential for wind generation in the U.S. is simply staggering.[9]

Wind power generation, in general, is dependent on the environment where wind is found, and the aggregate size of the land area under consideration is, in some respects, irrelevant.[10] Instead, dependable winds[11] are imperative—without a provable wind resource no development can take place.[12] Even the turbines themselves are built for specific wind conditions.[13] Production potential is, however, only the

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be installed by the end of 2008. AMERICAN WIND ENERGY ASS'N, ANOTHER RECORD YEAR FOR NEW WIND INSTALLATIONS (2008), http://www.awea.org/pubs/factsheets/Market_Update.pdf.

6. This is an equivalent number, rather than an equality, because the production power curve of land-based turbines often runs, more or less, inversely to the demands on the electrical grid. Power from land-based wind generation—especially for towers over 35 feet from the ground (the current generation of 2.5 MW wind towers are often well over 350 feet)—is generally optimal at night. Conversely, demand for electricity is greater during the daytime. Since energy storage has not yet come of age, this presents a genuine problem for grid operators (and developers selling energy) seeking to provide continuous, reliable electricity to the consumer. Excess capacity from other energy sources must be available on the grid to augment intermittent wind power. TORE WIZELIUS, DEVELOPING WIND POWER PROJECTS: THEORY AND PRACTICE 59 (2007) [hereinafter WIZELIUS]; Andrew H.P. Swift, *Wind In Texas, 2008: The State of the Industry*, 2008 WIND ENERGY INST. 1 (Univ. of Tex. Sch. of Law Continuing Legal Educ.).

7. Germany = 7.00%, Spain = 11.76%, Ireland = 8.42%, and Denmark = 21.22%. EUROPEAN WIND ENERGY ASS'N, WIND ENERGY LEADS EU POWER INSTALLATIONS IN 2007, BUT NATIONAL GROWTH IS INCONSISTENT 4 (2008), http://www.ewea.org/fileadmin/ewea_documents/mailing/windmap-08g.pdf. [hereinafter EWEA REPORT].

8. *Id.*; AWEA 2007 MARKET REPORT, *supra* note 5, at 1; *see* U.S. DEP'T OF ENERGY, ANNUAL REPORT ON U.S. WIND POWER INSTALLATION, COST, AND PERFORMANCE TRENDS: 2006 (2007), *available at* http://www.nrel.gov/wind/pdfs/41435.pdf.

9. The top five states in potential wind resources alone have an estimated 5,520 *billion* kWh of harvestable energy. *See* PNL Assessment, *supra* note 1, at 52.

10. Texas (261,797.12 sq. miles) is nearly three times as large as the fifteenth largest state, Kansas (81,814.88 sq. miles), yet Texas only holds about 11% more potential wind resources—1,190,000 billion kWh versus 1,070,000 billion kWh. U.S. CENSUS BUREAU, STATE & COUNTY QUICKFACTS (2008), http://quickfacts.census.gov/qfd/ [hereinafter U.S. CENSUS BUREAU]; PNL Assessment, *supra* note 1.

11. Wind speed can be classified on a scale from Class 1 through Class 7. Currently, wind speeds above Class 4 (15.7-16.7 mph at 164 feet) are generally preferred for utility-scale turbines. *See* PAC. NORTHWEST NAT'L LABORATORY, WIND ENERGY RESOURCE ATLAS OF THE UNITED STATES (2004), *available at* http://rredc.nrel.gov/wind/pubs/atlas/tables.html. Another major factor in examining wind speed is matching the turbine to the site. Wind speeds higher than those for which a turbine is rated will result in "spillage," as the blades will electronically feather to shed wind. Extremely high wind speeds—above fifty-five miles per hour—will cause most any turbine to "cut-out" (shut down and turn out of the main wind direction). WIND POWER IN POWER SYSTEMS 32 (Thomas Ackerman ed., Wiley 2005) [hereinafter WIND POWER IN POWER SYSTEMS].

12. For a general explanation regarding the evaluation of wind resources, see AM. WIND ENERGY ASS'N, BASIC PRINCIPLES OF WIND RESOURCE EVALUATION (2008), http://www.awea.org/faq/basicwr.html.

13. For instance, a General Electric turbine rated at 2.5 MW would be able to generate 2,500 kW. Turbines are designed for different wind conditions and must be matched to such

threshold consideration for determining if development of wind energy is economical in a particular locale. Energy must also be delivered to population centers, and this constraint must be considered as well.

2. Transmission

Power transmission is currently the greatest impediment to the wider deployment of utility-scale wind energy.[14] Transmission is, of course, required for any source of energy, but because of wind's intermittent generation characteristics, wind generation is especially dependent on robust transmission. In brief, injecting wind energy onto the electrical grid requires a utility operator to transmit that energy when it is produced and still find a way to balance demand loads using other energy sources when the wind is not blowing. Thus, greater reliance on wind energy requires wide-ranging and robust transmission lines to balance generation with load demands. Ideally, the transmission framework would cover a large geographic area so, for example, if the wind were not blowing in West Texas, a grid operator could balance load demands with generation from wind farms in the Gulf of Mexico or the plains of Kansas.[15]

3. Consumption

Consumers are, unsurprisingly, price-sensitive. For a number of years the comparatively high price of wind energy served as the best argument against wider deployment. That argument has lost much of its force, as wind is now less expensive than other traditional sources of energy for new, incremental capacity.[16] However, wind energy remains more expensive relative to already-existing fossil fuel facilities.[17]

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conditions accordingly. Wind conditions are only ideal intermittently, so estimates of generation of energy by wind turbines are discounted. For example, it may be estimated that, due to the wind not always blowing, the turbine will generate only 10% of th nameplate value. The "nameplate capacity" of a wind turbine (indicating the maximum power a turbine can generate) is calculated according to ideal wind conditions.

14. WIND POWER IN POWER SYSTEMS, *supra* note 11, at 281; *see infra* Section III.A. and B. It should be noted that not all wind generation faces the same transmission constraint—"small wind" turbines, designed for on-site placement and consumption, only encounter transmission problems (more accurately distribution-level problems) when their owners seek to feed (sell) excess energy back into the grid. An example of on-site generation is a "small wind" turbine sited at a farm or school that delivers energy directly into the main utility breaker panel (direct-current output would require an inverter).

15. Building up robust transmission capabilities is expensive, and greater distances between points of generation and consumption translate into higher costs. Additionally, power generated from a utility-scale wind turbine must be sent through a step-up substation to increase the voltage for transmission and interconnection with a utility electric grid before being "stepped-down" for distribution to consumers.

16. *See, e.g.,* WESTAR PLAN, *infra* note 30.

17. An often-used general calculation is that wind costs around 5¢ to 6¢ per kWh, while already-existing coal generation costs about half that amount. Negative externalities are ignored in these calculations.

Three factors led to the cost inversion between wind and fossil fuel power. First, the price of wind energy dropped precipitously. In the early 1980s, energy generated from wind cost nearly 30¢ per kWh; today, a kWh of wind is closer to 5¢.[18] Second, fossil fuel prices—especially oil prices—rose to record highs, even when accounting for inflation.[19] Third, social entities began demanding that energy providers more fully incorporate the impact of harvesting fossil fuels (namely, negative externalities including environmental impacts) into market prices.[20]

B. Sources of Opposition

In the abstract, polls indicate that 90% of Americans support building more wind turbine farms, and 86% want increased funding for renewable energy research.[21] Specific siting of wind power projects, however, can be problematic due to local resistance based on "not-in-my-backyard" ("NIMBY") sentiment.[22] Even in locations where this type of resistance is attenuated, or non-existent, other opposing forces can arise. To oversimplify, typical opposition groups, other than NIMBY, fall into one of two categories: Established Energy and Land Use Opposition.[23]

1. Traditional Energy Generation Sources

Faced with widespread public support for wind, traditional energy generators do not *openly* oppose wind as a competing energy source.[24]

18. AM. WIND ENERGY ASS'N, COST (2008), *available at* http://www.awea.org /faq/cost.html. In 2006, Kansas had an average *retail* residential rate from *all* energy sources of 8.25¢ per kWh; Texas had an average of 12.86¢ per kWh. ENERGY INFO. COMM'N, RESIDENTIAL ELECTRICITY PRICES: A CONSUMER'S GUIDE (2008), *available at* http://www.eia.doe.gov/ bookshelf/brochures/rep/Printer_friendly.pdf.

19. It is debatable whether the supply-side of this trend is an enduring phenomenon. What appears to be beyond argument, however, is the increased commodity demands associated with a growing worldwide, industrialized population.

20. For example, Austin Energy had to suspend its Green Choice program because demand outstripped supply. Other utilities have reported similar problems in meeting demand. *See* Sweeney Interview, *infra* note 80

21. GLOBAL STRATEGY GROUP, THE 2007 YALE CENTER FOR ENVIRONMENTAL LAW & POLICY SURVEY ON AMERICAN ATTITUDES ON THE ENV'T (2007), *available at* http://research. yale.edu/envirocenter/uploads/epoll/YaleEnvironmentalPoll2007Keyfindings.pdf.

22. NIMBY sentiment can appear in unexpected places. *See, e.g.,* WENDY WILLIAMS & ROBERT WHITCOMB, CAPE WIND: MONEY, CELEBRITY, CLASS, POLITICS, AND THE BATTLE FOR OUR ENERGY FUTURE ON NANTUCKET SOUND (2007) (offering a colorful, class-warfare account of wind energy opposition in Cape Cod and greater Nantucket Sound. Of particular interest is the strange mix of political bedfellows that work diligently to thwart development. Household political names and their real-world lobbying practices populate the tale).

23. This classification system is my own; others take a more comprehensive approach. *See* WIZELIUS, *supra* note 6, at 129 (stating that telecommunication companies and the military are common sources of opposition).

24. The National Mining Association, through its lead statistician, Leslie Coleman, stated that it supports all domestic energy resources but added that wind should be envisioned as *supplementary* energy because of its intermittent production characteristics. Telephone Interview with Leslie Coleman, Lead Statistician, Nat'l Mining Ass'n (Feb. 14, 2008). Speaking for the Nuclear Energy Institute, Data Analyst David Bradish was more circumspect and

However, the lack of public opposition does not appear to be reflected in local action, and for good reason. If a territory is able to generate 1% (or 40%)[25] of its electricity from wind, that demand is lost to traditional energy producers. Combined with the fact that electricity consumption is not growing rapidly,[26] generation is rightly seen as a zero-sum economic environment.[27]

Further, there is ongoing competition among generators for the support of regional transmission organizations ("RTOs") and independent system operators ("ISOs").[28] RTOs and ISOs control the flow of energy on regional grids, help determine the placement of future transmission lines, and resolve issues of priority dispatch.[29] The respective policies of RTOs and ISOs are, in turn, heavily influenced by the attitudes of member utilities and the dynamics of regional politics. All of these sources together strongly influence which energy sources are favored to supply future demand.[30]

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declined to offer any opinion on the role wind could play in the U.S. energy portfolio. Bradish noted that the NEI had no interest in being seen as opining on the limitations of a popular energy source. Telephone Interview with David Bradish, Lead Data Analyst, Nat'l Energy Inst. (Feb. 25, 2008).

25. Western Denmark routinely receives over 40% of its electricity from wind and, in many months, has more wind generation than consumption, highlighting the regional nature of electricity generation. Email from Anders Højgaard Kristensen, Master Engineer, Danish Energy Auth., to Ryan Trahan, Author (March 4, 2008 3:54:50 CST) (on file with author); DANISH ENERGY AUTHORITY, MASTER DATA FOR WIND TURBINES AS AT END OF JANUARY 2008 (2008), *available at* http://www.ens.dk/sw34512.asp; EWEA REPORT, *supra*, note 7.

26. ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2008 (2008), *available at* http://www.eia.doe.gov/oiaf/aeo/pdf/earlyrelease.pdf (predicting electricity consumption to grow from 3,814 billion kWh in 2006 to 4,972 billion kWh in 2030—an annual increase of 1.1%).

27. This refers to new generation only. Replacement of aging plants is a separate matter that could favor traditional energy sources in the short-run depending on the future of a national carbon emissions regime. Additionally, site-specific transmission line proposals may align different energy producers in the short run.

28. RTOs were created, under the authority of the Federal Energy Regulatory Commission (FERC), to regulate and monitor regional transmission zones. Federal Regulation and Development of Power, 16 U.S.C.A § 824(a) (West 1978); *cf.* Regional Transmission Organizations (RTO), 18 C.F.R. § 35.34 (2006). Kansas is part of the Southwest Power Pool (SPP) RTO, while most of Texas is located in The Electric Reliability Council of Texas (ERCOT) ISO.

29. If more than one energy generator is feeding into a single transmission line, there exists the possibility that more energy will be generated than could be transmitted for a specific time period. Physical priority dispatch would designate, by standing policy, which energy producer's generation was purchased for transmission. This could create a political issue for the RTOs as FERC has a standing *policy* of open access. *See* Final Rule of Open Access and Stranded Costs, 61 Fed. Reg. 21,540 (April 24, 1996) (codified at 18 C.F.R. § 35.34(i)). On the other hand, wind power is generated intermittently and must be transmitted when produced, or lost (at least until energy storage comes of age). The issues in priority dispatch are more complicated than described, but this footnote provides a stylized overview. Based, in part, on comments from Kenan Ögelman, *CREZ and More: Who Will Have Access to the Transmission, and On What Terms?*, 2008 WIND ENERGY INST. 8 (Univ. of Tex. Sch. of Law Continuing Legal Educ.).

30. *Cf.* WESTAR ENERGY, A STRATEGIC PLAN FOR UNCERTAIN TIMES 12-14 (2008), *available at* http://www.westareenergy.com/corp_com/contentmgt.nsf/resources/CEP/$File/CEP.pdf?openelement (discussing the importance of social attitudes in energy planning) [hereinafter WESTAR PLAN].

2. Land Use Opposition

This diverse set of entities—made up of environmentalists, sportsmen, and neighbors—is connected through concerns about land use, rather than any diametric opposition to wind energy. Land use debates are generally localized, and these groups tend to coalesce and exert resistance close to home. Generally, the goal is to re-site specific development projects.

Developers appear to have accommodated two prominent groups of rural land users (neighbors and hunters) with success. Darren LaSort, Hunting Programs Director at The National Rifle Association ("NRA"), noted that none of the NRA's constituents had ever raised any concerns about wind turbines conflicting with established hunting grounds.[31] Savvy developers help guarantee this circumstance by granting generous numbers of hunting permits and encouraging open communication on newly developed land.[32] Neighbors present more complex issues, ranging from noise[33] and viewscape to distaste or envy; however, such matters are normally a question of negotiation. One successful developer strategy for co-opting neighbors is to designate a development area much larger than where turbines will actually be placed.[34] Everyone in the area then gets paid some amount, whether or not a turbine is placed on their land, which also aids developers in controlling negotiations with multiple landowners.[35]

Environmental organizations are the final prominent group in land use opposition. These groups tend to follow a pattern of strong national support for wind development balanced against local chapters' efforts to oppose inappropriate siting.[36] How that national-local tension is resolved

31. Telephone Interview with Darren Lasort, Director of Hunting Programs, Nat'l Rifle Ass'n (Mar. 3, 2008). Mr Lasort did indicate an interest in obtaining any future research on hunting impacts.

32. Not all developers are savvy. Some older ground leases stipulated that the landowner was responsible for any damage done to a tower or turbine on account of hunting. Such provisions constrained an owner's ability to accommodate hunting uses. Telephone Interview with Ken Wasserman, Partner, Norton, Wasserman, Jones & Kelly L.L.C. (Mar. 28, 2008).

33. *See* WIZELIUS, *supra* note 6, at 159 (providing a concise explanation of turbine decibel levels).

34. *See* discussion. *infra* Section III.A.1.

35. *Id.*

36. John S.C. Herron, of The Nature Conservancy of Texas, noted that national-local disagreement had slowed TNC's efforts to endorse wind power in general or to provide any specific guidelines covering the myriad of environmental issues involved development. E-mail from John S.C. Herron, Dir. of Conservation Programs, The Nature Conservancy of Tex., to Ryan Trahan, Author (Mar. 6, 2008, 12:28:51 CST) (on file with author). By contrast, the Sierra Club has officially supported wind at the national level since 1973; the Lone Star Branch, however, currently opposes the Kennedy Ranch development in Texas. *See* SIERRA CLUB, SIERRA CLUB CONSERVATION POLICIES: WIND SITING ADVISORY, http://www.sierraclub.org/policy/conservation/ wind_siting.asp; Donna Hoffman, Op-Ed., *How to Balance Wind Power and Wildlife*, AUSTIN AMERICAN-STATESMAN, Feb. 14, 2008, *available at* http://mendocoastcurrent.wordpress.com/2008/02/20/how-to-balance-wind-power-and-wildlife.

is mostly contingent on the attitudes of local developers. In Texas, developer resistance has prevented enactment of voluntary siting guidelines for wind projects,[37] while Kansas passed guidelines covering the sensitive Flint Hills region back in 2003.[38] Seventeen other states have also enacted site protections.[39]

Most wind developers are repeat players in many states throughout the country. Unfortunately, developers, like those opposing guidelines in Texas, risk blighting the reputation of wind as a clean energy source by opposing sensible guidelines in only a few select states.[40] Even a small change in the perceived eco-friendly nature of wind generation could greatly increase the level of transactional costs incurred in future wind development projects.

III. TEXAS AND KANSAS

A. Landowners and Land Use

Building wind power requires a cooperative landowner. Unlike the third-party opposition groups discussed above, landowners reap direct financial benefits from development. Thus, there exists the potential for an alliance of interests, and partnership, between landowners and developers.

Inappropriate siting can lead to habitat fragmentation, wetland degradation, soil erosion, high avian mortality, or other issues that become more prevalent with poorly sited wind turbines. For a discussion of the many serious environmental impacts of wind development, *see* Victoria Sutton & Nicole Tomich, *Harnessing Wind is Not (by Nature) Environmentally Friendly*, 22 PACE ENVTL. L. REV. 91 (2005).

37. The National Wind Coordinating Committee provides a widely emulated siting template. NAT'L WIND COORDINATING COMM., PERMITTING OF WIND ENERGY FACILITIES (2002), *available at* http://www.nationalwind. org/publications/siting/permitting2002.pdf. The Lone Star Sierra Club is one organization negotiating with industry developers, through Texas Parks and Wildlife Department, to implement voluntary siting restrictions. *See* Hoffman, *supra* note 36.

38. ENVTL. AND SITING COMM. OF THE KAN. RENEWABLE ENERGY WORKING GROUP, SITING GUIDELINES FOR WIND POWER PROJECTS IN KANSAS (2003), *available at* http://www.kansasenergy.org/Kansas_Siting_Guidelines.PDF. Bill Griffith, Energy Chair of the Kansas Sierra Club, pointed out that developers in Kansas were fairly agreeable to signing up for the siting guidelines because the guidelines are voluntary and do not cover the entire state. Telephone Interview with Bill Griffith, Energy Chair, Sierra Club Kansas Chapter (Mar. 18, 2008).

39. *See* U.S. FISH AND WILDLIFE SERV., WIND POWER SITING REGULATIONS AND WILDLIFE GUIDELINES IN THE UNITED STATES (2007), *available at* http://www.fws.gov/Midwest/eco_serv/wind/guidance/AFWASitingSummaries.pdf.

40. Altamont Pass, California is a classic example of poor siting. That project has killed thousands of birds, especially raptors. *See, e.g.*, Michael Distefano, *The Truth about Wind Turbines and Avian Mortality*, 8 SUSTAINABLE DEV. L. & POLICY 10 (2007) (asserting that Altamont's 7,000 wind turbine development has killed 22,000 birds and 400 Golden Eagles since it went operational in the 1980s).

1. Farmers and Ranchers

Provided with a chance to sprout 300- to 400-foot wind turbines out of their fields, many ranchers and farmers have cultivated the opportunity. In Texas, the national leader in wind power generation, the majority of the wind farms are located in ranching country near the town of Sweetwater. Louis Brooks, Jr., is a resident rancher in the area and a prominent participant in wind development.[41] The Brooks family owns twenty-eight sections of land under wind leases and receives $500 per month for each of their seventy-eight turbines (another seventy-eight are on the way.)[42]

The ranching and hunting operations on the Brooks' land have not been greatly impacted by the addition of turbines.[43] Neither the cattle nor the local hunters seem to mind the structures.[44] Also, the access roads were built in accordance with already-existing waterways to prevent erosion.[45] Brooks attributed this overall fortunate situation to good legal representation, as his lawyer rewrote the original developer's lease and added erosion control, access schedules, and waterway protection measures.[46]

Kansas is generally more reliant on crop farming than on ranching, so development of wind energy resources has required contemplation of slightly different issues. Still, Raymond Kindel, one of seventeen farmers participating in a wind project under construction in Cloud County, Kansas, stated that the economic decision to accept turbines was straightforward.[47] Separate conversations with landowners participating in the project indicate that the developer of the Cloud County project offered to pay each landowner $20 per acre annually for land located within the several square miles making up the wind park that will not have any towers located on it.[48] For land that has a tower sited on it, the

41. Telephone Interview with Louis Brooks, Jr., Rancher, Sweetwater, Texas (Mar. 28, 2008). Brooks was recently featured in a New York Times article. *See* Krauss, *supra* note 2.

42. *Id.*

43. *Id.*

44. *Id*. In fact, during filming for a recent television program, a number of the Brooks' cattle bedded down next to several of the turbine pads.

45. *Id*. Erosion can be a powerful problem. *See* Paul Gipe, *Erosion Gullies in the Tehachapi Pass: An Example of Improper Wind Development*, WIND-WORKS.ORG (2003), http://www.wind-works.org/articles/TehErosion.html.

46. *Id.* Lisa Chavarria, attorney with Stahl, Bernal & Davies L.L.P., provided representation.

47. Telephone Interview with Raymond Kindel, Professional Family Farmer (Mar. 5, 2008) [hereinafter Kindel Interview].

48. *Id.* The developer was Horizon Wind Energy of Houston, Texas. From the beginning, the proposed development included several square miles. The developer had not erected any meteorological towers (a nearly five year process for this development), so it could not know exactly what land would provide the best sites for turbine placement. To circumvent hard feelings among neighbors (and concomitant opposition) the developer offered the same deal to all the landowners in the development zone. Each landowner was guaranteed some payment from the project, and those with land taken up by turbines were guaranteed additional

price is $6 per month, plus an additional quarterly payment for each tower. All farmers in the project, with towers and without, are contracted to receive a percentage of the profit from the project, partly based on payments from the power purchase agreement with the participating utility.[49] The farmers in the project weighed such payments against acreage lost to the construction of towers and roads.[50]

Notably, the impact of construction on existing farming operations was intended to be minimal. The lengthy leases negotiated by the landowners included guarantees from the developer to conduct the operations in a "Farmer Friendly" manner. Farmer Friendly is a term, commonly defined in the ground lease, that addresses the particular concerns of crop farmers: reconstructing and upgrading fences and gates, rebuilding and grading any disturbed terraces back to compliance,[51] and improving county roads.[52] Additionally, in the Cloud County project, the developer agreed to pay the fees of each landowner's attorney (anyone of their choosing) to scrutinize the voluminous 30-year lease.[53] Kindel indicated that, as of the three-quarters point of the project, the developer had made a good showing in upholding the contract provisions.[54]

payments. Out of eighteen landowners, only one owner chose not to participate in the development; it is not clear whether he signed a waiver for nuisance litigation.

49. The power-purchase agreement was signed with Westar Energy, discussed *infra* Section III.C.1. Several individuals indicate that such an agreement would create royalty payments of between 3-5% in Kansas. In Texas, royalty payment agreements are generally higher—between 5-8%. The farmers participating in the project decided, in advance of finding out where the towers would be placed, to allow everyone to share in a percentage of the profit as a matter of fairness. The percentage of profit payment is derived by an undisclosed formula.

50. Kurtis Kocher, another farmer participating in the Cloud County development, estimates he will lose only between 3.5 to 4 acres for the 30-foot-wide access roads and seven turbines placed on his land. Telephone Interview with Kurtis Kocher, Professional Family Farmer (Mar. 5, 2008) [hereinafter Kocher Interview]. Kindel estimated a 2 acre loss. *See* Kindel Interview, *supra* note 47.

51. The access roads are to be built at grade, and both farmers indicated that their field patterns will not likely change after the development. For tilling, they will just pick up the implement at the access road and sit it back down after crossing. Both farmers indicated that the developer's engineer was receptive to moving certain roads that would have impeded normal oprations. Kindel Interview, *supra* note 47; Kocher Interview, *supra* note 50. Terrace compliance is controlled (through financial incentives) by the United States Department of Agriculture National Resources Conservation Service (established in 1935 as the Soil Conservation Service). *See* Natural Res. Conservation Serv., Compliance with NEPA, 7 C.F.R. § 650.4(f) (1979).

52. Developers state that road upgrades are often necessary to allow transport of the giant turbine blades over narrow, aged county roads.

53. Many of the farmers chose Ken Wasserman, Partner, Norton, Wasserman, Jones & Kelly L.L.C. Kindel Interview, *supra* note 47.

54. Kindel noted that some local roads had been improved to the point where he would no longer need to pay the county to lay rock during winter months. He also noted a number of small gestures that bode well for long-term relations including the developer's efforts at cleaning-up construction debris, roads built at grade in the fields, and the developer offering to wait to build a road until Kindel had an opportunity to finish his wheat harvest. Telephone Interview with Raymond Kindel, Professional Family Farmer (Oct. 1, 2008) [hereinafter Kindel Interview II].

2. Urban Applications—School Districts

In contrast to utility-scale development, urban generation of wind power is largely a small-wind endeavor.[55] Even small turbines run into opposition, however, as residents are often naturally wary of problems associated with new technology. The solution for broader acceptance appears to lie in community education and proper siting.

School districts are an increasingly common urban owner of small-wind installations. Robert Courtney, Energy Manager for Olathe USD (part of the greater Kansas City metropolis), runs a program that is a leading example of how schools are incorporating wind energy into the educational experience.[56] Courtney oversees a comprehensive "green efficiency program" that includes a 35-foot turbine generating 450 kWh per month.[57] Although the turbine is employed to power a concessions building, the primary use is in educating the district's students, who can wirelessly access electrical generation information in real-time from anywhere in the district.[58]

Similar wind programs are taking off in Texas. Shallowater ISD, located in Shallowater, Texas, is another school district with an innovative wind program. Phil Warren, Superintendent, stated that the district recently installed five wind turbines between its three school locations, each with a nameplate capacity of 50 kW.[59] Based on the first ten months of operations, he estimates that the machines reduced the district's energy costs by 25-35%, or roughly $75,000 per year.[60]

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55. Select cities are, however, deploying utility-scale wind in urban environments, for example Hull, Massachusetts and Reading, England. *See, e.g.,* CITY OF HULL, HULL WIND PRODUCTION (2008), http://www.hullwind.org; ECOTRICITY, GREEN PARK (2008), http://www.ecotricity.co.uk/layout/set/popup/wind-parks/green-park-reading.

56. The program has avoided cost savings of more than $15 million over the past thirteen years. Olathe created the Energy Manager position after contracting with Energy Education, Inc. (Witchita Falls, TX) for consulting services to save money through energy efficiencies. Courtney noted that his job entails researching consumption trends (he has created a 15-year database) and educating teachers, students, and administrators about efficient consumption. Retrofit projects are ongoing and increasing in scale. Telephone Interview with Robert Courtney, Energy Manager, Olathe School District 233 (Feb. 25, 2008).

57. *Id.* The turbine is a Southwest Wind Power Skystream 1.7 with a nameplate capacity of 3.6 kW. Installation was comparatively expensive, requiring "one-off" architect and engineering plans.

58. *Id.* The monitoring equipment, from Fat Spaniel Technologies, Santa Clara, CA, allows students to conduct experiments and gain a better understanding of wind power generation and consumption patterns.

59. Telephone Interview with Phil Warren, Superintendent, Shallowater ISD (Mar. 28, 2008) [hereinafter Warren Interview].

60. *Id.* The five turbines were purchased from Entegrity Wind Systems and retail for $900,000 installed, indicating a 12-year payback. Accounting for higher future fuel energy prices, the actual payback period will likely be a few years shorter. A 5-year maintenance agreement is also included in the purchase price. Insurance coverage was accomplished through a rider on the district's existing policy and, for all five units, costs only $1,500 per year. An energy efficiency contract with TAC Energy Solutions, Carrollton, Texas is estimated to save another $75,000.

The major hurdle to implementation was obtaining an interconnection agreement with the local electricity cooperative.[61] Originally the cooperative flatly rejected the idea of adding turbines to the grid; it later changed its stance based on a review of federal interconnection requirements.[62] Even after agreeing in principle to allow generation, the cooperative opposed installing one large turbine, as capacity restraints on the distribution lines would have required expensive infrastructure upgrades.[63] A project consisting of five turbines was eventually approved, and it was constructed and operational in a short six weeks.[64] The only potential permitting concern was the local airport regulation, which turned out not to be applicable because the turbines were under 101 feet.

Shallowater's wind energy program has been a financial and educational boon,[65] although Warren did estimate that about 3% of the community still opposes the turbines. Nearly all the opposition comes from high-end homeowners located near the towers.[66] The district recently commissioned a noise impact study that found that the turbines did not increase the baseline decibel level by more than two decibels and that the spectrum of noise was unchanged from before the installation.[67]

In sum, both the Shallowater and Olathe programs represent small, albeit innovative, parts of a groundswell of social and economic change wrought by wind development. Indeed, parallel programs created at the collegiate level are training students to fill the many jobs created by strong and growing industry demand.[68] The confluence of human capital

61. *Id.*

62. *See* Energy Policy Act of 2005, 16 U.S.C. § 2621(d)(15) (2005) [hereinafter EPAct of 2005] (amending 16 U.S.C. § 2621(d) (1978)) (requiring electric utilities to make interconnection available to consumers upon request). The utility resisted because, *inter alia,* the school district is a large customer and decreased energy consumption would result in decreased revenue. This revenue would need to be made up elsewhere in the system unless government-based decoupling incentives were available. Warren Interview, *supra* note 59.

63. Warren Interview, *supra* note 59 The district originally sought to purchase a single 650 kW unit.

64. *Id.* It took another two months to optimize turbine performance.

65. In addition to the economic benefits, the school is partnering with Texas Tech University, under a grant from the Department of Energy, to allow doctoral students to study their energy program. These programs redound to the advantage of the district's students as they get exposure and experience working with cutting-edge and future-oriented technology through a mesonet monitoring and experiments program.

66. Warren Interview, *supra* note 59.

67. *Id.* Changes in the normal spectrum of noise are easily discernable because the frequency of the sound is uncharacteristic—either very high or very low—thereby making it more noticeable.

68. Wind Instructor Bruce Graham is a leading force behind the creation of the Wind Energy Program at Cloud County Community College. The program started with one class in the fall semester of 2006 and now has 3 instructors and 45 students—10 students remain on the waiting list. Graham is concurrently working with a group of AWEA educators to develop an industry-wide certified "skill set" for wind technicians. Graham notes that a handful of other wind programs already exist nationwide; more are being created in several wind-producing states. Email from Bruce Graham, Wind Energy Instructor, Cloud County Community College, Concordia, Kansas, to Ryan Trahan, Author (Aug. 20, 2008) (on file with author).

and training is attracting manufacturers as well.[69] As such, these programs are merely snapshots of the mosaic of activity that is fabricating "green jobs" right now.

B. Wind Developers

In many respects, utility-scale and small-wind developers inhabit different businesses.[70] Still, both sets of developers confront similar problems in grid interconnection issues and regulatory acceptance. What follows is a brief look at the core challenges faced by each type of developer.

1. Small-Wind

Small-wind developers face challenges in changing expectations about electricity generation and usage. In any small-wind community, such expectations are partly shaped by the attitudes of legislative and regulatory gatekeepers who influence the development landscape.[71] The biggest obstacle to more small-wind development is proving to gatekeepers that adding small-wind generation to the grid will have few detriments.

Charles Newcomb, Managing Director of Operations at Entegrity Wind Systems, markets a 100-foot vertical-lattice tower wind turbine system (the one used by Shallowater High School) nationally and has worked in both Texas and Kansas.[72] In sharp contrast to many states east

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Manuel Montalvo, Jr., who oversees a team of forty to sixty employees and works on service and construction sites from Washington to Texas, states that meeting the demand for qualified and reliable workers is an enormous challenge. That urgency translates into high comparative wages for workers in the wind industry—often starting wages are $20 per hour plus benefits in rural areas. As Montalvo pointed out: if the wind turbines are not properly maintained and managed, investors will not meet their financial metrics and the industry's growth will slow. Telephone Interview with Manuel Montalvo, Jr., Southern Operations Manager, Energy Maint. Serv. LLC (Mar. 8, 2008). A parallel trend is the short-term boom that is provided by the construction of wind projects. At the Cloud County Wind Farm, discussed above, much of the construction labor was provided locally, and community merchants were often sourced for goods and services. Kindel Interview II, *see supra* note 54.

69. Sunflower LLC, Hutchinson, Kansas recently announced plans to manufacture a 2.5 MW wind turbine based on technology licensed from Fuhrländer. The Hutchinson Kanas plant is to employ 250 workers. SUNFLOWER WIND, http://www.sunflowerwind.com/ (last visited Nov. 25, 2008).

70. "Utility-scale" implies giant projects funded by millions of dollars in capital investment; "small-wind" deployment suggests smaller turbines in smaller numbers with system costs measured in the thousands.

71. Including local legislators and, prominently, the relevant utility. The 'development landscape' refers to net metering standards, tax breaks, and other incentives; a discussion of current and proposed measures follows in Section IV, *infra*.

72. Telephone Interview with Charles Newcomb, Managing Dir. of Operations, Entegrity Wind Systems (Mar. 10, 2008) [hereinafter Newcomb Interview]. Newcomb is an alumnus of the National Renewable Energy Laboratory, as are most of the members of the Entegrity team. He maintains that the Colorado-manufactured vertical lattice tower costs about $25-35K less than a monopole and is easier to maintain because most repair jobs do not require a crane and bucket. Additionally he asserts that the vertical-lattice tower does not have the bird nesting problems of

of the Mississippi, he gives both states' local communities high marks for not requiring cumbersome permit processes.[73] He notes that the lack of permit opposition allows developers working in these states to focus on the customer and the local utility, both of whom have different concerns about price and risk.[74]

The market often resolves customer concerns—if the product is appealing and cost effective, demand normally follows. Utility issues, by contrast, are more intractable because these entities lose revenue when a customer consumes less energy, and payments to customer-generators can directly affect bottom-line profits. Newcomb noted that much of his time is spent explaining why these losses are, in terms of magnitude, not significant.[75]

An accommodating utility can facilitate small-wind development by providing technical expertise, standardized interconnection procedures, and generous power-purchase agreements. Even high-end safety equipment requirements (visible disconnects and protective relays) are useful to developers in preventing accidents and pricing-out shoddy competitors.[76] The converse is also true—a utility's institutional position can be used to impede interconnection.[77] Further, utility attitudes weigh heavily in legislative determinations on appropriate compensation for customer-generators. Matching future small-wind supply with customer demand, therefore, remains a function of support from local utilities and their sponsored legislatures.

2. Utility-Scale Wind

Even more than with small-wind developers, the challenges of utility-scale wind largely reside in working with the electrical infrastructure controlled by political and regulatory bodies.[78] Specifically, anemic

the horizontal lattice towers, like those used in Altamont Pass discussed, *supra* note 40.

73. *Id*.

74. *Id.* On the customer side, Entegrity's turbine costs about $185,000 installed with an estimated usable life of around 25 years, depending on maintenance and environmental conditions. The cost recovery time varies with the specific installation, although the benchmark is under 10 years. For consumers, financial risk exposure can be mitigated through various insurance products, although prior disaster planning remains a necessity. Risks run the gamut from natural disasters (tornados) to legal quagmires (trespasser injuries or nuisance litigation).

75. *Id.* Newcomb estimated that the distributed cost of deriving 1% of generation from small-wind would be about 70¢ per customer in Colorado, where Entegrity is headquartered. He argues that fuel cost adjustments, due to rising commodity prices, are two orders of magnitude larger than net metering. The case of Shallowater ISD provides a bookend illustration of the difficulty of applying such estimates to a particular utility system. For a technical look at associated grid issues, *see* BRENDAN KIRBY ET AL., COST—CAUSATION BASED TARIFFS FOR WIND ANCILLARY SERVICE IMPACTS 12 (2006), *available at* http://www.nrel.gov/wind/pdfs/40073.pdf.

76. Newcomb Interview, *supra* note 72.

77. *See* Warren Interview, *supra* note 59.

78. Certain technical difficulties do exist, such as a current shortage of wind turbine supply, but these problems are transient and will undoubtedly be resolved by market forces.

transmission capacity is responsible for derailing many proposed wind farm projects. Such deficiencies are commonly described in chicken-and-egg terms: developers cannot commit to additional projects without assurance of adequate transmission, and transmission builders cannot commit to additional lines without assurance of generation and a compensating rate base.[79]

The high cost of transmission line build-out—about $1.5 million per mile depending on environmental conditions—often renders private-line construction economically infeasible.[80] As such, wind developers often must rely on RTOs and ISOs to solve transmission problems, and not all are equal. The Electric Reliability Council of Texas ("ERCOT"), for instance, benefits from being contained in a single state as contrasted with the Southwest Power Pool ("SPP"), which is required to oversee portions of several states and multiple state regulatory authorities.[81] According to Geoff Coventry, Vice President of Market Development for TradeWind Energy, this circumstance makes SPP more susceptible to regulatory gridlock at the state-level.[82] Having many different parties negotiating for their narrow transmission interests often causes cost allocation schedules to doom development.[83]

A different transmission solution lies with the utilities themselves. Coventry asserts that, because utilities make money from asset purchases (and the corresponding rate bases), investor-owned utilities ("IOUs") should have an incentive to build transmission, especially if provided with a state mandate.[84] Wind developers, however, opine that utilities are sometimes blinded by a solitary focus on generation and have resisted

79. Mike Grable, *CREZ: What Was Decided by the Interim CREZ Order, and What Is Left to Do?,* 2008 WIND ENERGY INST. 4 (Univ. of Tex. Sch. of Law Continuing Legal Educ.).

80. Telephone Interview with Patrick Sweeney, Vice President of Bus. Dev., Austin Energy (Mar. 17, 2008) [hereinafter Sweeney Interview]; Telephone Interview with Greg Greenwood, Vice President of Generation and Constr., Westar Energy (Mar. 27, 2008). The dollar-per-mile figure increased nearly 50% over the past few years in line with higher commodity prices.

81. SOUTHWEST POWER POOL, SOUTHWEST POWER POOL FAST FACTS (2008), *available at* http://www.spp.org/publications/SPP_Fast_Facts.pdf. ERCOT also benefits from a number of forward-thinking programs including Competitive Renewable Energy Zones (CREZ); a proper discussion of that program is beyond the scope of this paper. For more information, s*ee, e.g.,* Diana M. Liebmann, *Electric Power, Part II: Issues Affecting Electric Transmission Infrastructure Development*, 2008 GAS & POWER INST. 3 (Univ. of Tex. Sch. of Law Continuing Legal Educ.).

82. SPP couples this difficulty with other inherent disadvantages including heavy reliance on relatively non-dispatchable energy sources such as coal and nuclear. Telephone Interview with Geoff Coventry, Vice President of Mkt. Dev., TradeWind Energy (Mar. 10, 2008) [hereinafter Coventry Interview]. Headquartered in Lenexa, Kansas, TradeWind is aligned with Italy's Enel SpA. Development issues are, at least, three-dimensional conflicts encompassing developers (wanting to build projects), state-regulatory authorities (protecting state rate payers), and RTOs/ISOs (maintaining reliability on the regional grid).

83. *Id.*

84. *Id*. In line with Mr. Coventry's recommendation, Westar Energy announced plans to form a joint transmission company with ETA two months after this conversation, *See infra* note 103. However, no state mandate has been provided as of yet.

such efforts.[85] Other challenges are procedural and process driven.[86] In sum, supply-side incentives—focusing solely on generation—are not likely adequate to encourage efficient development without a concurrent emphasis on transmission.

C. The Utility Perspective

The impact of publicly regulated utilities sprawls across virtually all aspects of wind energy development; however, a single "utility perspective" on wind development does not appear to exist.[87] In many respects, differences in generation portfolio, capital resources, and vision often make utilities more dissimilar than not. The following is a look at two utilities that still operate a more traditional,[88] vertically integrated business, and the manner in which wind development issues affect their respective businesses.[89]

1. Westar Energy

Westar Energy is an IOU and the largest electric energy provider in Kansas, serving a customer base of over 674,000.[90] It owns twelve power plants with a total capacity of 6,100 MW. Currently Westar generates no wind energy. Power purchase agreements with independent wind developers, however, will provide 300 MW of wind capacity when construction is completed in late 2008.[91]

85. Transmission upgrades would take the pressure off specific projects and could help provide for system-wide access. System-wide access refers to the ability of an RTO to call upon resources from anywhere in the regional grid. This is important for stability of the power supply as loads and supply can be balanced over a larger region, an issue particularly relevant for intermittent generation sources like wind.

86. For instance, developers assert that the standard FERC application process is not well equipped to handle a large number of wind farms, as it is geared to focus on single-unit centralized power systems. Relationally, interconnection studies in SPP cost $160,000 for a single *proposal* and can take over two years for a determination.

87. Texas, on its own, is home to roughly 165 utilities, many with starkly different economic concerns for adding additional wind resources. *See*, PUB. UTIL. COMM'N, MARKET DIRECTORIES AND UTILITIES: ELECTRIC COMPANIES SERVING TEXAS (2008), http://www.puc.state.tx.us/electric/directories/index.cfm (Subdivision companies not counted separately).

88. Energy deregulation – spurred by the Energy Policy Act of 2005 – is changing utility business models, and the future of the utility industry is in flux. Westar, for instance, recently announced plans to become involved in a pure, ultra-high capacity transmission line business. *Westar Energy, ETA Form Transmission Company,* N. AMER. WIND POWER (May 20, 2008), *available at* http://www.nawindpower.com/e107_plugins/content/content.php?content.2255.

IOUs in Texas are even further along the path of deregulation. This paper skirts issues involving deregulation that are paramount in Texas and becoming more so in other RTO zones. The reasons for not directly addressing those issues are twofold. First, a detailed discussion would not be well placed in this general interest article. Second, SPP, and its member utilities, continue to lag behind ERCOT in setting up truly competitive markets with disaggregated utility functions, thereby making comparison more difficult.

90. Westar Energy, About Us, http://www.westarenergy.com/corp_com/contentmgt.nsf/publishedpages/about%20us%20home (last visited Nov. 25, 2008).

91. Westar Energy, Renewable Generation, http://www.westarenergy.com/corp_com/

Once that 300 MW of capacity is online, Westar plans to file a green tariff with the Kansas Corporation Commission ("KCC") for increased rates.[92] Greg Greenwood, Vice President of Generation and Construction at Westar, noted that the tariff is necessary because wind generation costs around $40-45 per MW versus the roughly $15 per MW embedded cost for traditional energy.[93] He added, however, that the *incremental* cost of adding wind is now less expensive than adding similar capacity for traditional energy resources (coal, nuclear, and natural gas).[94]

On the transmission side of the business—mirroring the national environment—Westar is beginning its first major transmission project in over twenty years.[95] The first stage of a 100-mile, 345 kV line is being constructed in 2008 at a cost of $150 million. Greenwood stated that Westar can continue to make these targeted upgrades for lines where it is economical, but transmission built for regional benefit, to remove flow constraints, must come from an SPP reliability project.[96] He rejected a state mandate model, although his reasoning was closely related to that expressed by developers: the need to increase system-wide access and allow for exporting energy to other states must be addressed as broadly as possible.[97]

Probably the most exciting developments at Westar are happening at the distribution level. Kevin Heimiller, Director of Customer Operations/Meter Operations, co-directs testing and implementation for the Advanced Metering Initiative ("AMI").[98] The goals of AMI are multifaceted: control loads, identify restoration points for reconnection, and facilitate a whole new range of rate structures with real-time monitoring.[99] One important potential impact could be on net-metering,

contentmgt.nsf/publishedpages/renewable (last visited Nov. 25, 2008). This figure is somewhat misleading because wind is not a dispatchable resource. SPP will conservatively credit Westar 30 MW (10%) of this amount for purposes of calculating its capacity requirements.

92. KCC is the state body for regulating utilities operating in Kansas. Similar to long established programs nationwide, Westar will provide a renewable enrollment option for customers seeking to purchase renewable energy. Enrolling customers will pay higher costs for electricity, thereby subsidizing the higher cost of renewable generation.

93. Telephone Interview with Greg Greenwood, Vice President of Generation and Construction, Westar Energy (Mar. 26, 2008) [herinafter Greenwood Interview]. The difference on a per-customer basis is estimated at $2.00-$2.50 a month.

94. *Id.*; WESTAR PLAN, *supra* note 30, at 29. Westar estimates that new clean coal costs around $2,500 per kW and nuclear costs about $2,800, while wind costs roughly $1,900 per kW.

95. Greenwood Interview, *supra* note 104. This roughly corresponds with no base load generation being built during the same time frame.

96. *Id.*

97. *Id*. This would indicate the need for an SPP project, or potentially a combination project by multiple RTOs, assuming away the difficulties with gaining FERC approval. A state mandate might make sense if SPP were not proactive in creating reliability projects, as Coventry mentioned above. *See supra* note 82.

98. Telephone Interview with Kevin Heimiller, Dir. of Customer Operations/Meter Operations, Westar Energy (Mar. 26, 2008). Heimiller has been working with metering solutions for thirty years.

99. *Id.* A pilot program is to be implemented in the next 6-12 months. Real-time monitoring

and thereby small-wind deployment. Real-time monitoring and pricing information would allow a utility to better regulate power coming on and off the grid and provide a more understandable basis for pricing customer-generation.[100] Heimiller noted that a broad goal of AMI is to provide a responsive system adaptable to future energy developments. Such developments could include power regulation through the use of hybrid cars.[101]

2. Austin Energy

Austin Energy ("AE") is the 9th largest community-owned utility in the United States (388,000 customers) and currently derives 214 MW of its total 2,600 MW capacity from wind.[102] AE's economic model varies somewhat from an IOUs', especially in relation to efficiency measures. AE actually benefits from dampened grid loads (through reduced consumption) as efficiency programs only cost the utility about $318 per kW of energy saved—far less than adding new capacity.[103] Customer-owners benefit through reduced electric bills. This difference in economic structure is important to understand at the outset because it potentially changes the decision-calculus of generating wind power.[104]

Other concerns with wind are familiar. Patrick Sweeney, Vice President of Business Development, echoed the concerns of utility-scale developers stating that limited transmission capacity is creating a bottleneck in delivering wind energy generation.[105] Sweeney identified part of the reason for the bottleneck: wind farm facilities can be built much more rapidly than traditional energy sources, taking only 18 months to go operational from the initial groundbreaking.[106] This quick build-out

will allow usage and pricing information every 15 minutes. To review the legislative spur, *see* Energy Policy Act of 2005, 16 U.S.C. § 1252 (2005).

100. For instance, a utility could set a base 'grid maintenance' charge to be paid by every customer, and it could also pay customers for generation based on load demand and traditional plant generation metrics.

101. This is a widely discussed proposal. Using hybrid car batteries to regulate energy flows is just one example of future-oriented proposals that could impact wind energy. The tie-in is that the power generated by wind—greatest at night—could charge electric car battery systems. During the daytime, part of that stored energy could then be fed back into the grid to balance out peak demand while still leaving enough power for the owner to commute home from work.

102. Austin Energy, Company Profile, http://www.austinernergy.com/About%20Us/Company%20Profile/index.htm (last visited Nov. 22, 2008); Austin Energy, Power Plants, http://www.austinenergy.com/about%20us/company%20profile/powerplants.htm (last visited Nov. 22, 2008).

103. *See* Sweeney Interview, *supra* note 80. An IOU is often conflicted in implementing efficiency programs as its business model boils down to selling more kWh. Reducing revenue by increasing efficiency could upset shareholders. For a municipality, extremely high rates of penetration might cause problems in paying for grid maintenance.

104. This difference would be more accentuated if a national carbon emissions regime were implemented.

105. Sweeney Interview, *supra* note 80.

106. *Id.* Sweeney contrasted this construction timeframe against a rapidly built gas facility (2 years) and other energy sources (up to 7 years). This point supports the FERC discussions, *see*

can result in greater generation than transmission, thereby creating supply constraints.[107]

For small-wind ('distributed generation' in utility parlance) the difficulty in increasing generation is, again, a lack of infrastructure. Delivery of energy requires a perfect balance of supply and demand on the grid within a very small tolerance. Thus, expanded penetration of small-wind generation requires upgrading outdated grid communication originally built for handling one-way power flows.[108] AE is currently working to complete this communication deployment process.[109]

The implications of upgraded meter systems are unforeseen. Sweeney offered that future consumers might pay a basic fee for grid access, similar to an all-inclusive cell phone plan.[110] Each customer-generator would then have access to sell its energy, although ultimate control of flows would necessarily reside with the utility.[111] Easy access to selling distributed power could thereby spark a spate of zero, or near-zero, consumption homes.

IV. SOCIAL AND REGULATORY CONTROL: PRACTICE AND PROSPECTS

A. National, State, and Local Incentives

Like all sources of energy generation, government incentives play a vital role in wind development. At the federal level, the Production Tax Credit ("PTC") is often considered to be the most important supply-side incentive.[112] It is also notoriously fickle, and the lack of stability has the perverse effect of discouraging long-term planning and development, especially in light of tight wind turbine supplies. Recently, congressional proponents extended the PTC as a part of the bailout bill, best known for the Emergency Economic Stabilization Act of 2008; it was set to expire within three months, and the new extension only lasts until December 31,

supra note 95.

107. *Id.* These problems have real-world impacts. AE had to suspend its popular Green Choice program (allowing customers to choose renewable power for their homes) for over a year due to a lack of supply.

108. To oversimplify: originally the electric grid was designed for one-way flows (generation-transmission-consumption); two-way flows create grid management difficulties at the distribution level.

109. Sweeney Interview, *supra* note 80. In 2007, AE replaced 127,000 old meters with automated meters; the remaining 260,000 units were to be replaced by the end of 2008. *EnergyPlus Customer Newsletter*, AUSTIN ENERGY (The City of Austin, Austin, Tex.), Feb. 2008 (on file with author).

110. Sweeney Interview, *supra* note 80.

111. *Id.*

112. *See* 26 U.S.C. § 45 (2008) (providing for tax credits for renewable energy producers). The production tax credit (PTC) is important because it provides a 2¢ per kWh (actually 1.5¢ in 1993 dollars, indexed for inflation) benefit for the first ten years of a renewable energy facility's operation. Public and quasi-public organizations are eligible for similar payment-based incentives under the Renewable Energy Production Incentive. 42 U.S.C. § 13317 (2008).

2009.[113] The four respective senators from Texas and Kansas showed their collective energy vision by voting against the extension early in 2008 when the PTC was defeated by a single vote. The two Texas senators voted for the extension as part of the bailout bill, however, while the Kansas senators did not.[114]

At the state-level Texas has enjoyed more competent wind energy leadership from its legislature. Texas was the first state in the nation to create a Renewable Portfolio Standard ("RPS"), and it has since been joined by twenty-four other states in requiring retail-sellers of electricity to provide certain minimum levels of renewable energy. Kansas does not have an RPS goal.[115] Between Kansas and Texas, only Texas has a statutory standard for net metering—the key government program for encouraging small-wind development.[116] Kansas, in fact, has only one statutory provision benefiting wind generation: a property tax exemption for renewable energy equipment enacted in 1999.[117] Texas enacted a similar provision in 1981.[118] Texas also provides other programs like a wind energy business franchise tax exemption[119] and statewide interconnection standards.[120]

In 2007 Texas surpassed California as the top wind generating state in the nation with installed capacity of 4,356 MW; it also had the most rapid growth—1,618 MW added in 2007 alone.[121] Kansas, by contrast, ranks twelfth in the nation in renewable wind capacity with 364 MW and no capacity was added in 2007.[122] Thus, although Texas is 7.5 times more populous than Kansas, it now has 12 times more installed wind capacity.[123]

113. *See* Energy Improvement and Extension Act of 2008, Pub. L. No. 110-343, Division B, 122 Stat. 3765 (2008).

114. The reasoning behind the first vote may be much easier to divine than the second where other issues were obviously present. *See* United States Senate, Legislation and Records, Vote Summary—H.R. 1424, *available at* http://www.senate.gov/legislative/LIS/roll_call_lists/roll_call_vote_cfm.cfm?congress=110&session=2&vote=00213; Am. Wind Energy Ass'n, Legislative Affairs, Senate Vote on PTC—February 6, 2008—PTCExtension Lose by 1 Vote, http://capwiz.com/windenergy/vote.xc/?votenum=8&chamber=S&congress=1102&voteid=10949216&state=US#activity.

115. Several states exclude municipally owned utilities from this standard. Texas set an RPS goal for 2015, which has already been surpassed in 2008. *See* 16 TEX. ADMIN. CODE § 25.173 (2007) (Pub. Util. Comm'n. of Tex., Goal for Renewable Energy) (stating a goal of 5,880 MW by Jan. 1, 2015). Innovative cities like Austin and San Antonio have sought to lead by setting independent goals for renewable consumption; no cities in Kansas have set targets.

116. 16 TEX. ADMIN. CODE § 25.242(h)(4) (2007) (Pub. Util. Comm'n. of Tex., Arrangements Between Qualifying Facilities and Electric Utilities).

117. KAN. STAT. ANN. § 79-201 (1999).

118. TEX. TAX CODE ANN. § 11.27 (Vernon 1981).

119. TEX. TAX CODE ANN. § 171.107 (Vernon 1999).

120. 16 TEX. ADMIN. CODE § 25.211 et seq. (1999) (Pub. Util. Comm'n. of Tex., Interconnection of On-Site Distributed Generation.

121. AWEA 2007 MARKET REPORT, *supra* note 5, at 8.

122. *Id.* at 3-8.

123. Kansas has about 2.7 million residents, while Texas has about 21 million. *See* U.S. CENSUS BUREAU, *supra* note 10. Both states have similar wind resources. *See* PNL Assessment, *supra* note 1; AWEA 2007 REPORT, *supra* note 5, at 8.

Again, in terms of potential MW production, Texas *holds only an 11% greater harvestable wind resource* than does Kansas.[124]

B. Moving Forward

The above empirical survey emphasizes many commonalities of wind development in Texas and Kansas: (1) both states have comparable levels of natural wind resources, (2) the sources of opposition in each state are nearly identical, (3) landowners in both states have favored development, (4) both states are home to innovative local wind energy education programs, and (5) each state suffers from a dearth of senatorial leadership. The major difference between the two states was set forth above: Kansas has thus far lacked the necessary state-level leadership required to compete in the development of wind energy. This absence of vision manifests in a shortage of incentive programs and an unfavorable regulatory framework. So, what is the next program that similarly situated states can implement in order to gain or, like Texas, maintain a position of prominence in wind energy development?

One widely discussed suggestion is for state governments to create incentive programs that decouple utility kWh sales from utility revenues. Although a full discussion is beyond the scope of this paper, a basic decoupling program would pay utility companies per kWh of energy saved through efficiency measures or generated through renewable energy. Properly implemented, such a system would allay many of the problems identified by the above empirical survey. For instance, a decoupling program could reduce the investment required for new transmission lines, encourage utility cooperation in small and large-scale project interconnection, and produce a local energy source buffered from the volatile global commodities market. This program would also put forward-thinking states in a leading position to profit from a future carbon tax regime.

V. CONCLUDING COMMENT

Enterprising states are facing a historic opportunity to aggressively deploy wind resources and grow richer through renewable energy leadership. As illustrated, the technology and human capital necessary to produce clean, domestic, and price-buffered energy are already being deployed. Surveying some of the many facets of development currently underway simply provides a benchmark starting point for the next generation of programs and incentives. In order to gain ground, innovative states need to rapidly rethink established social and regulatory attitudes about renewable energy development.

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124. *See* PNL Assessment, *supra* note 1.