ENVIRONMENTAL PERSPECTIVES ON SITING WIND FARMS: IS GREATER FEDERAL CONTROL WARRANTED?

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INTRODUCTION

The threats of global climate change are becoming an increasingly important area of concern both domestically and internationally. The Intergovernmental Panel on Climate Change (IPCC) has found that "[w]arming of the climate system is unequivocal," and is causing widespread increases in temperature, rising sea levels, increases in intense cyclone activity in the North Atlantic, and disruption of biological systems.[1] In a dramatic demonstration of the world's growing concern surrounding the topic, the Nobel Foundation awarded the 2007 Peace Prize to the IPCC and Albert Arnold Gore, Jr., "for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change."[2] Although the United States has not ratified the Kyoto Protocol, even domestically climate change has become a subject of national governmental concern: President Barack Obama's energy platform includes proposals for a nationwide cap-and-trade program and a national Renewable Portfolio Standard.[3]

As the need to address the threat of climate change becomes

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[1] INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, FOURTH ASSESSMENT REPORT 30–33 (2007), *available at* http://www.ipcc.ch/ipccreports/ar4-syr.htm.

[2] The Nobel Peace Prize 2007, http://nobelprize.org/nobel_prizes/peace/laureates/2007/ (last visited Apr. 21, 2009).

[3] OBAMA FOR AMERICA, NEW ENERGY FOR AMERICA 1 (2008), *available at* http://www.barackobama.com/pdf/factsheet_energy_speech_080308.pdf.

ever clearer, energy sources that do not emit greenhouse gasses (GHGs) become more valuable and attractive. Wind power is widely hailed as a means of producing electric power without harmful GHG emissions; it is non-depletable, does not give off emissions which contribute to air pollution or global warming, and has lower operating costs than power produced through fossil fuels.[4] Wind is an attractive alternative energy source because it has low volatility and is less costly than other renewable energy sources.[5] Although currently only representing a tiny percentage of the United States electric power generation capacity, wind power is an increasingly important source of electricity generation for the nation, and has grown at a higher rate than other sources of electric power.[6] The United States has enough wind to meet the current electricity consumption of the nation; however, industrial scale wind installations are not practical everywhere there is wind, so the amount of wind that can be harnessed may fall short of this.[7] In recognition of this, the United States Department of Energy began Wind Powering America in 1999, which is an initiative aimed at increasing generation of electricity through wind power.[8]

However, "[n]o resource type is truly 'green.'"[9] Wind power

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[4] U.S. GOV'T ACCOUNTABILITY OFFICE, RENEWABLE ENERGY: WIND POWER'S CONTRIBUTION TO ELECTRIC POWER GENERATION AND IMPACT ON FARMS AND RURAL COMMUNITIES 1 (2004), *available at* http://www.gao.gov/new.items/d04756.pdf [hereinafter GAO, RURAL COMMUNITIES]. Additionally, wind power has positive national security benefits (as it reduces dependency on foreign oil) and can be a source of development in rural areas. *Id.* at 12, 29.

[5] James Griffin, Improving Cost Effectiveness and Mitigating Risks of Renewable Energy Requirements 31 (Sept. 2008) (Ph.D. dissertation, Pardee Rand Graduate School), *available at* http://www.rand.org/pubs/rgs_dissertations/2008/RAND_RGSD236.pdf.

[6] Wind power only accounted for .001 percent of total electric power generation capacity in the United States in 2003, but wind power generating capacity quadrupled in the thirteen years previous to 2003 and had an average annual growth rate of 28 percent in the period from 1999 to 2003. GAO, RURAL COMMUNITIES, *supra* note 4, at 5.

[7] Department of Energy, Wind Energy Resource Potential, http://www1.eere.energy.gov/windandhydro/wind_potential.html (last visited Mar. 28, 2009).

[8] AMERICAN WIND ENERGY ASSOCIATION, FAIR TRANSMISSION ACCESS FOR WIND: A BRIEF DISCUSSION OF PRIORITY ISSUES 1 (2000), *available at* http://www.awea.org/policy/documents/transmission.PDF; Department of Energy, Wind Powering America, http://www.windpoweringamerica.gov/ (last visited Apr. 1, 2009).

[9] Elizabeth Thomas, *The Myth of a Single, "Green" Power Resource*, 10 NAT. RESOURCES & ENV'T 65, 80 (Winter 1996).

is not an unmitigated good, nor is it universally or wholeheartedly embraced by environmentalists.[10] Wind farms dramatically alter the landscapes in which they are placed, damaging wildlife habitats and scenic vistas; they can be noisy; and turbines can also have severe negative impacts on flying animals such as birds and bats.[11] Additionally, many people living near proposed wind developments worry that large wind installations will reduce the value of surrounding property. So, although it may be crucial (for the mitigation of global climate change) to ensure that there are no unreasonable barriers to developing this emerging green power source, we should also ensure that any negative environmental impacts of the technology are taken into account and dampened as much as possible.

So far, regulation of windmill siting on private lands has been left to the states. In many states, siting decisions are, in turn, left to local decision-makers who handle them primarily through zoning laws. Although there are national interests in mitigating global climate change and preventing harm to migratory species, the federal government has had almost no role in wind turbine siting decisions.[12] However, because the impacts of large wind farms are a complex mixture of local and national concerns, it is unclear whether the current system of regulation or one that involves more federal control would best maximize social welfare in making these decisions.

As wind power becomes an increasingly important source of electricity in this nation, there have been calls to increase federal

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[10] *See* John Arnold McKinsey, *Regulating Avian Impacts Under the Migratory Bird Treaty Act and Other Laws: The Wind Industry Collides with One of Its Own, the Environmental Protection Movement*, 28 ENERGY L.J. 71, 88 (2007); Victoria Sutton & Nicole Tomich, *Harnessing Wind is Not (by Nature) Environmentally Friendly*, 22 PACE ENVTL. L. REV. 91 (2005).

[11] U.S. GOV'T ACCOUNTABILITY OFFICE, WIND POWER: IMPACTS ON WILDLIFE AND GOVERNMENT RESPONSIBILITIES FOR REGULATING DEVELOPMENT AND PROTECTING WILDLIFE 9, 37, 38 (2005), *available at* http://www.gao.gov/new.items/d05906.pdf [hereinafter, GAO, PROTECTING WILDLIFE]. Although bats have sonar and rarely run into large objects, the rapid pressure drop caused by rotating turbine blades can cause bats' lungs to explode. Jessica Marshall, *Wind Turbines Kill Bats Without Impact*, DISCOVERY NEWS, Aug. 25, 2008, http://dsc.discovery.com/news/2008/08/25/wind-turbine-bats.html.

[12] The federal government has created tax incentives to offset the high capital costs in raising a wind installation, and has issued voluntary guidelines for reducing wildlife impacts of wind turbines on public land, but has had little role in wind turbine siting decisions on private land. *See infra* Parts I.B., III.A.3.

control of the turbine siting process. Organizations concerned with the welfare of animals affected by wind turbines want the national government to oversee siting decisions and create mandatory guidelines to prevent harm to wildlife.[13] The former chief of the U.S. Fish and Wildlife Service also asked Congress to make the service's voluntary guidelines for minimizing wildlife impacts in the siting of turbines mandatory.[14] Others arguing for national regulation point to the uncertainty of current state and local permitting processes as stifling wind development.[15] They assert that since wind shows such potential to address global climate change, the national government should create an expedited permitting process to prevent unreasonable local prejudices against wind turbines from inhibiting development of this resource.

The fact that wind power could play a role in mitigating climate change is not, however, rationale enough for giving the federal government complete control over local zoning decisions, which have traditionally been left to the states.[16] Wind power is not the only solution to the problems of climate change, and it may not be the best solution everywhere it is a feasible energy alternative. So, it is important for the maximization of welfare that the level of government ultimately given authority to regulate wind turbine siting be properly able to evaluate and balance the type and scope of those turbines' environmental costs and benefits.

In this paper I will examine which level of government is best suited to regulating the siting of industrial wind turbines on private land from an economic perspective that seeks to maximize social welfare. In Part I, I discuss the wind and electricity industries and the current regulatory framework for wind turbine siting. In Part

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[13] *See Gone with the Wind: Impacts of Wind Turbines on Birds and Bats: Hearing Before H. Natural Resources Comm., Subcomm. on Fisheries, Wildlife and Oceans*, 110th Cong. 35–41, 54–61 (2007) (statements of Donald Michael Fry, Director of Pesticides and Birds Program, American Bird Conservancy, and Mike Daulton, Director of Conservation Policy, National Audubon Society), *available at* http://resourcescommittee.house.gov/images/Documents/20070501b/testimony_fry.pdf [hereinafter "Fry testimony"]; http://resourcescommittee.house.gov/images/Documents/20070501b/testimony_daulton.pdf [hereinafter "Daulton testimony"].

[14] Allison Winter, *Renewable Energy: FWS Chief Recommends Mandatory Wildlife Review*, ENV'T & ENERGY DAILY, May 2, 2007, *available at* http://www.fws.gov/offices/pdf/Renewableenergy.pdf.

[15] *See* McKinsey, *supra* note 10, at 88–89.

[16] *See, e.g.*, Village of Euclid v. Ambler Realty Co., 272 U.S. 365, 387 (1926) (describing zoning as a valid exercise of the states' police powers).

II, I review academic theories relating to which level of government is best suited to make environmental regulations. In Part III, I apply those theories to the siting of windmills and show that limiting local control of siting decisions to avoid "NIMBY" problems is warranted.[17] Because the effects of turbines are highly site-specific, but national interests are implicated in siting decisions, a state-federal hybrid scheme should be used to regulate wind turbine siting.

I. BACKGROUND INFORMATION

A. *Industry Information*

1. *Electricity*

Although this paper primarily focuses on environmental factors in wind farm siting, it is important first to focus on the wider context in which siting decisions are made. The viability of wind power depends upon both the ability of generators to physically transmit their product to consumers and a regulatory structure that supports such transmission.

Electricity production in the United States is moving toward a regional market of producers and distributors from a localized, command-and-control model.[18] This transition began in the late 1970s, when Congress enacted the Public Utility Regulatory Policies Act of 1978 (PURPA) to promote new sources of electricity (such as wind power facilities). PURPA forced electric utilities to allow these sources to connect to the grid, and to purchase power from them at the utilities' "incremental cost" or "avoided cost" (what it would have cost the utility to generate the same quantity of power through traditional means).[19] The Energy Policy Act of 1992 (EPACT)[20] furthered this transition by promoting wholesale competition in the electric industry.[21]

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[17] NIMBY, or "not in my backyard," refers to resistance against locating a necessary but undesirable collective good (such as a prison, recycling plant, or cellular tower) in one's own neighborhood.

[18] Steven J. Eagle, *Securing a Reliable Electricity Grid: A New Era in Transmission Siting Regulation?*, 73 TENN. L. REV. 1, 1–2 (2005).

[19] 16 U.S.C. § 824a-3 (2006).

[20] Energy Policy Act of 1992, Pub. L. No. 102-486, 106 Stat. 2776 (codified in scattered sections of 42 U.S.C. § 13317(a)).

[21] Samuel R. Brumberg, *Getting the Camel out of the Tent: Behind the*

EPACT allowed the Federal Energy Regulatory Commission (FERC) to require a utility to provide transmission services to other utilities, at the request of those utilities.[22] This change began a shift toward deregulation of electricity markets in the states, allowing consumers to choose their power providers, and giving alternative energy providers (such as wind power) greater access to customers than before.[23]

There are three major power grids (networks of interconnected electricity generation, transmission, distribution, and communication facilities) in the United States: the Eastern Interconnected System, the Western Interconnected System, and the Texas Interconnected System.[24] There are some connections between the Eastern and Western Grids, and among the Western and Texas Grids and Mexico, and among the Eastern and Western Grids and Canada.[25] Within each grid, the connected utilities buy and sell power from one another, creating a wholesale market in electricity.[26] These wholesale markets theoretically make it possible for wind energy generated in one area to power the homes and businesses in another. However, since many potential wind sites are in remote areas, in practice they remain impractical for development because they are far from existing transmission facilities.[27] Additionally, many transmission lines and connections between lines in the windiest areas are too small to carry the amount of power it would be possible to generate using wind turbines.[28] This has prevented the "windiest sites" from being

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Federal Energy Regulatory Commission's Rise to Power and the Importance of States' Continued Regulatory Oversight, 30 WM. & MARY ENVTL. L. & POL'Y REV. 691, 701 (2006); *see* PETER ASMUS, REAPING THE WIND: HOW MECHANICAL WIZARDS, VISIONARIES, AND PROFITEERS HELPED SHAPE OUR ENERGY FUTURE 3 (2001).

[22] Energy Information Administration, Electric Power Industry Overview 2007, http://www.eia.doe.gov/cneaf/electricity/page/prim2/toc2.html (last visited Apr. 21, 2009).

[23] *See* ASMUS, *supra* note 21, at 3.

[24] Energy Information Administration, *supra* note 22.

[25] *Id.*

[26] *Id.*

[27] *See* Darrell Blakeway & Carol Brotman White, *Tapping the Power of Wind: FERC Initiatives to Facilitate Transmission of Wind Power*, 26 ENERGY L.J. 393, 398 (2005); AMERICAN WIND ENERGY ASSOCIATION, WIND ENERGY—HOW DOES IT WORK 2, *available at* http://www.awea.org/pubs/factsheets/Wind_Energy_How_does_it_Work.pdf.

[28] Matthew L. Wald, *Wind Energy Bumps Into Power Grid's Lines*, N.Y. TIMES, Aug. 27, 2008, at A1, *available at* http://www.nytimes.com

built.[29] These problems of transmission create concrete physical limitations on the expansion of wind power that must be addressed before the nation can fully develop this resource.

2. *Wind Industry in America*

Although the wind power has been used for centuries, the commercial wind industry is relatively young. Modern commercial development of wind power began as a response to the energy crisis of the 1970s and increasing concern about air pollution.[30] During this time, the federal government enacted PURPA[31] and created two tax credits allowing wind-energy companies to offset 25 percent of wind development costs.[32] It also, through the Wind Energy Systems Act of 1980, authorized a federal research and development program for wind power run by the Department of Energy (DOE) and the National Aeronautics and Space Administration (NASA).[33] The resulting experimental turbine designs in the 1970s and 80s included spectacular failures which garnered much media attention, possibly framing the public's perception of wind power as unreliable and undesirable.[34] This perception, at least among utility companies, lasted into the 1990s.[35] However, turbine technology has greatly improved in the decades since, which has redeemed wind power's image.

Wind farms are large groups of wind turbines (sometimes thousands) connected at a single transmission point on the grid.[36] The first commercial wind farms in America were developed in

/2008/08/27/business/27grid.html.

[29] *Id.* at A15 (quoting Gabriel Alonso, Chief Development Officer of Horizon Wind Energy).

[30] *See* ROBERT W. RIGHTER, WIND ENERGY IN AMERICA: A HISTORY 152–55 (1996).

[31] *Supra* text accompanying note 19.

[32] RIGHTER, *supra* note 30, at 207.

[33] 42 U.S.C. §§ 9201-9203 (2000).

[34] RIGHTER, *supra* note 30, at 171–76. The DOE Federal Wind Energy Program, begun in 1976, tested new, small wind turbines (ranging in size from 1.5kW to 40kW) at Rocky Flats, Colorado. *Id.* at 172–73. At Medicine Bow, Wyoming, the DOE, in collaboration with the Bureau of Reclamation tested large turbines. *Id.* at 175–76.

[35] *Id.* at 268–69.

[36] CALIFORNIA WIND ENERGY COLLABORATIVE, IMPACT OF PAST, PRESENT AND FUTURE WIND TURBINE TECHNOLOGIES ON TRANSMISSION SYSTEM OPERATION AND PERFORMANCE 3 (2006), *available at* http://www.energy.ca.gov/2006publications/CEC-500-2006-050/CEC-500-2006-050.pdf.

California in the 1980s, in large part due to the incentive of combined federal and state tax credits.[37] These wind farms were located in three main regions: Altamont Pass, Tehachapi Pass, and San Gorgonio Pass.[38] The farms at Altamont Pass (which turned out to be popular habitat for red-tailed hawks and golden eagles) became notorious for the unexpected environmental damage they wreaked: between 1985 and 1988 ninety-nine raptor deaths from electrocution and collision with wind generators at Altamont Pass were recorded.[39] This brought the environmental tradeoffs of wind power to public attention.

Initial commercial wind development was swift: by 1985, the United States had the capacity to produce up to 1000 Megawatts (MW) of electricity from wind.[40] After that, wind power expanded more slowly, only reaching 2000 MW in 1999. Since then, wind power generation in the country has rapidly increased. The current national wind power capacity is 25,170 MW (spread throughout thirty-five states) and there are another 4,451 MW under construction as of December 31, 2008.[41]

3. *Industrial Wind Turbines*

To understand the environmental tradeoffs of wind development, it is helpful to know something about the machines themselves and the infrastructure they require. Wind turbines can be divided into two categories: small wind turbines and industrial turbines. Small turbines are used by individual residences or businesses for their power needs. When these small turbines produce power in excess of that needed by the individual facility, the power feeds into the grid where it either offsets electricity used by the electricity consumer under a net metering plan or is purchased by utilities at "avoided cost" (a price lower than that paid for electricity from the same utility).[42] Industrial wind

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[37] RIGHTER, *supra* note 30, at 202–09.

[38] CALIFORNIA WIND ENERGY COLLABORATIVE, *supra* note 36, at 4.

[39] RIGHTER, *supra* note 30, at 250.

[40] AMERICAN WIND ENERGY ASSOCIATION, U.S WIND ENERGY INSTALLATIONS: TOP 20,000 MW 2, *available at*: http://www.awea.org/pubs/factsheets/20GW.pdf.

[41] American Wind Energy Association, U.S. Wind Energy Projects as of Dec. 31, 2008, http://www.awea.org/projects/ (last visited Feb. 12, 2009).

[42] AMERICAN WIND ENERGY ASSOCIATION, FREQUENTLY ASKED QUESTIONS ABOUT NET METERING 1, *available at* http://www.awea.org/pubs/factsheets/netmetfin_fs.pdf.

turbines, on the other hand, are used by independent power producers to generate power for the wholesale utility market in competition with other large electricity producers.[43] This paper focuses on the siting of these larger, utility-scale turbines.

Utility-scale wind turbines are giant industrial machines. The primary type of utility-scale wind turbine in use today is the horizontal-axis turbine, which looks like a three-bladed propeller on a tall pole.[44] Turbines vary in size, but in order to capture the swift, steady winds necessary for reliable energy production, they are often mounted far above the ground.[45] On the larger end of the spectrum, a machine with a 90-meter tower and 90-meter rotor diameter stands close to 450 feet from the ground to the tip of the rotor.[46]

Early turbines were noisy, inefficient, and unreliable. Since the first industrial wind farms in the early 1980s, wind turbines have become larger, quieter, more reliable, and produce more energy at less cost than ever before.[47] Turbines are now mounted on poles, instead of lattice structures, to minimize bird perches (and thereby reduce bird deaths).[48] Wind developers have also experimented with the way turbines are lit, in an attempt to make

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[43] *See* NATIONAL WIND COORDINATING COMMITTEE, PERMITTING OF WIND ENERGY FACILITIES 5 (2002), *available at* http://www.nationalwind.org/publications/siting/permitting2002.pdf.

[44] American Wind Energy Association, Wind Web Tutorial, http://www.awea.org/faq/wwt_basics.html (last visited Feb. 10, 2009). Utility scale turbines are those with a greater than 100 kilowatt capacity, but most utility-scale turbines are much larger, in the 700-kW to 2.5-megawatt range. The average American household uses 10,655 kilowatt-hours (kWh) of electricity in a year. Since one megawatt of wind energy can generate 2.4 to 3 million kWh annually, this could provide enough power for 225 to 300 households.

[45] Adam M. Dinnell & Adam J. Russ, *The Legal Hurdles to Developing Wind Power as an Alternative Energy Source in the United States: Creative and Comparative Solutions*, 27 NW. J. INT'L L. & BUS. 535, 540 (2007).

[46] American Wind Energy Association, *supra* note 44. Small wind turbines typically have a rotor diameter of eight meters or less, and stand on towers of forty meters or less.

[47] Dinnell & Russ, *supra* note 45, at 540.

[48] AMERICAN WIND ENERGY ASSOCIATION, WIND ENERGY AND WILDLIFE: FREQUENTLY ASKED QUESTIONS 5, *available at* http://www.awea.org/pubs/factsheets/050629_Wind_Wildlife_FAQ.pdf. However, at least one study has suggested that this may not improve avian mortality rates. *See* C.G. THELANDER, K.S. SMALLWOOD, AND L. RUGGE, BIRD RISK BEHAVIORS AND FATALITIES AT THE ALTAMONT PASS WIND RESOURCE AREA (2003), *available at* http://www.nrel.gov/docs/fy04osti/33829.pdf.

the structures less lethal to birds.[49] Earlier turbine models were noisy: the gear boxes often created a constant whining sound and the blades made a "thumping" sound as they passed the tower.[50] Although not completely silent, modern designs have eliminated much of the noise, and the industry claims that most of the remaining noise is drowned out by the sound of the wind in these areas.[51]

Wind power generating facilities are diffuse, meaning that land can be used for other activities, such as farming or wilderness, while also producing electricity.[52] However, accompanying the towers themselves are transmission stations, maintenance roads, and underground transmission lines.[53] Additionally, heavy machinery and large cranes are required for erecting the turbines.[54] This means that development of a wind farm can have a significant impact on the surrounding area, which is why the Sierra Club recommends siting utility-scale turbines first on land that has already been substantially disturbed and agricultural lands, rather than in parks and wilderness areas.[55] There are also noise

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[49] AMERICAN WIND ENERGY ASSOCIATION, WIND TURBINE LIGHTING 1 (2004), *available at* http://www.awea.org/pubs/factsheets/WTLighting-factsheet-rev.pdf. The FAA requires that all structures over 200 feet have warning lights. Studies have shown that simultaneous flashing red lights, rather than steadily burning red lights are less attractive to birds, and thus can prevent avian deaths. Paul Kerlinger, Wind Turbines and Avian Risk: Lessons from Communication Towers, Proceedings of the Wind Energy and Birds/Bats Workshop (May 18–19, 2004), *available at* http://www.awea.org/pubs/documents/WEBBProceedings 9.14.04%5BFinal%5D.pdf.

[50] AMERICAN WIND ENERGY ASSOCIATION, FACTS ABOUT WIND ENERGY AND NOISE 2–3, *available at* http://www.windturbinesyndrome.com/wp-content/uploads/2008/09/awea-re-noise.pdf.

[51] *Id.* The strategies include positioning rotors upwind (to avoid the thumping noise as they pass the shadow of the tower), soundproofing the nacelles (where the generator and gears are), and making turbine blades more efficient. *See also* Dinnell, *supra* note 45, at 540. For a video made at the base of a wind turbine demonstrating the sound of propellers as they pass in the shadow of the tower, see http://www.youtube.com/watch?v=FA9uBdkmRtY.

[52] AMERICAN WIND ENERGY ASSOCIATION, WIND ENERGY FOR YOUR FARM OR RURAL LAND 4, *available at* http://www.awea.org/pubs/factsheets/WindyLandownersFS.pdf. Wind turbines and access roads typically occupy less than 3 percent of the land in a wind farm.

[53] *See* NATIONAL WIND COORDINATING COMMITTEE, *supra* note 43, at 8.

[54] *See id.* at 12; AMERICAN WIND ENERGY ASSOCIATION, *supra* note 50, at 4.

[55] Sierra Club, Sierra Club Conservation Policies: Wind Siting Advisory, http://www.sierraclub.org/policy/conservation/wind_siting.asp (last visited Apr. 7, 2009).

problems and air quality impairments during the construction phase of the project.[56] However, these environmental problems are dwarfed by the air pollution caused by the operation of coal-fired power plants.[57] Rural communities may also be concerned about the aesthetic impact of industrial development in their pastoral areas.

When wind power developers are looking for a good site for wind turbines there are two key factors they consider: wind quality[58] and transmission accessibility.[59] An example of the interplay of these two factors is reflected in the popularity of the Altamont Pass region for the development of wind farms. Although this region does not supply the best wind for development, it is close to an important transmission substation for northern California, which minimizes transmission costs in developing the region, making it attractive to developers.[60]

After finding a viable site, the developer must then secure access to land through easements and lease agreements which pay landowners royalties on the power produced.[61] Developers also often pay a fixed fee to land owners for using their property during

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[56] *See* AMERICAN WIND ENERGY ASSOCIATION, *supra* note 50, at 4; NATIONAL WIND COORDINATING COMMITTEE, *supra* note 43, at 31.

[57] Sierra Club, Clean Air: Dirty Coal Power, http://www.sierraclub.org/cleanair/factsheets/power.asp (last visited Apr. 6, 2009).

[58] Wind quality is evaluated for both speed and consistency. Mustafa P. Ostrander, *Wind Power: A Lawyer's Guide to Representing Landowners*, 16:6 BUS. L. TODAY, July–Aug. 2007.

[59] AMERICAN WIND ENERGY ASSOCIATION, WIND ENERGY FACT SHEET: 10 STEPS IN BUILDING A WIND FARM 1, *available at* http://www.awea.org/pubs/factsheets/10stwf_fs.pdf. For wind development, a minimum average wind speed of 11–13 mph is needed. *Id.*

[60] CALIFORNIA WIND ENERGY COLLABORATIVE, *supra* note 36, at 4–5. Because wind farms can be built much more quickly than transmission lines can be extended to them, it may be infeasible for energy developers to build where there are no transmission lines. Texas State Energy Conservation Office, Wind Energy Transmission, http://www.seco.cpa.state.tx.us/re_wind-transmission.htm (last visited Apr. 6, 2009).

[61] AMERICAN WIND ENERGY ASSOCIATION, *supra* note 59, at 1. For example, lease agreements on turbines located in Minnesota and Iowa can generate $2,000 to $4,000 per turbine (a 2–4 percent royalty on the annual gross revenue of the turbine). JAY HALEY, U.S. DEP'T OF ENERGY, LANDOWNER'S FREQUENTLY ASKED QUESTIONS ABOUT WIND DEVELOPMENT 1, *available at* http://www.windpoweringamerica.gov/pdfs/wpa/34600_landowners_faq.pdf. Many farmers find it easier to lease land to wind developers than to own a wind project, because of the complexity of wind projects and the risks associated with them. GAO, RURAL COMMUNITIES, *supra* note 4, at 38–40.

the times the turbines aren't running (during preconstruction, construction, removal, and site remediation).[62] Since the investment involved in installing wind power generating turbines will often result in a higher property tax assessment for the landowner, the developer may also agree to reimburse the land owner for the increased tax burden.[63] The developer will then need to raise capital, secure permits from the relevant authorities (which vary between jurisdictions), and contract with a power purchaser or market.[64]

B. *Current Regulatory Framework*

Although the federal government has a large hand in energy policy and regulation of electricity markets, power plant siting decisions have been left primarily to the states.[65] Thus, current regulation of the siting of industrial wind development projects on private lands in the United States is primarily decentralized, handled by either state or local governments, or the two in tandem.[66] Only in projects with federal participation (such as funding) would federal regulations factor into siting decisions on private lands.[67] However, the federal government, through the United States Fish and Wildlife Service (FWS), also has the power to prosecute wind power companies for killing species protected under the Migratory Bird Treaty Act,[68] the Bald and Golden Eagle Protection Act,[69] and the Endangered Species Act,[70] although it has never done so.[71]

1. *Federal Environmental Regulation of Wind Power Siting Decisions*

The federal government only directly regulates the siting of

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[62] Ostrander, *supra* note 58, at 27.

[63] *Id.*

[64] AMERICAN WIND ENERGY ASSOCIATION, *supra* note 59, at 1.

[65] *See* Shane Ramsey, *Power Plant Siting in a Deregulated Electric Energy Industry: Discerning the Constitutionality of Siting Statutes Under the Dormant Commerce Clause*, 21 J. LAND USE & ENVTL. L. 91, 91–92 (2005); Electric Information Administration, *supra* note 22.

[66] *See, e.g.*, GAO, PROTECTING WILDLIFE, *supra* note 11, at 3.

[67] *Id.* at 4.

[68] 16 U.S.C. §§ 703-12 (2006).

[69] 16 U.S.C. § 668 (2006).

[70] 16 U.S.C. §§ 1531-44 (2006).

[71] GAO, PROTECTING WILDLIFE, *supra* note 11, at 33–39.

wind turbines when they are built on federal land or with federal money.[72] Thus far, the federal government has not played much of a role in regulating windmill sites because the majority of wind development has been on private lands.[73]

a. *Development on Public Lands*

The primary environmental laws which wind developers on federal lands must comply with are the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA).

Under NEPA, a pre-construction Environmental Impact Statement (EIS) must be completed for large projects funded by the federal government or on federal lands that "significantly affect[] the quality of the human environment."[74] NEPA supplies procedural requirements, rather than substantive requirements, so it does not mandate that any particular outcome of agency action be reached. However, the process of creating an EIS is costly and time consuming. Thus, this requirement may create an incentive to mitigate the environmental impact of a project so that a cheaper, quicker Environmental Assessment may be done instead.[75]

Section 7 of the ESA requires every federal agency to ensure that any action undertaken by that agency will not "jeopardize the continued existence" of threatened or endangered species, nor "result in the destruction or adverse modification" of those species' critical habitats.[76] If the proposed project could adversely impact endangered species or critical habitat, the agency in control of the land being developed would be required to consult with FWS or the National Marine Fisheries Service (NMFS) and possibly undertake mitigation efforts for the impact on any

[72] However, the federal government does have substantial influence over transmission expansion decisions which directly affect the feasibility of transmitting electricity from windy areas to power consumers. Department of Energy, National Electric Transmission Congestion Report and Final National Corridor Designations: Frequently Asked Questions 1–2 (2007), *available at* http://nietc.anl.gov/documents/docs/FAQs_re_National_Corridors_10_02_07.pdf; *see* Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (codified in scattered sections of 42 U.S.C. § 13317(a)).

[73] GAO, PROTECTING WILDLIFE, *supra* note 11, at 1.

[74] National Environmental Policy Act of 1969 § 102, 42 U.S.C. § 4332 (2006).

[75] Bradley C. Karkkainen, *Toward a Smarter NEPA: Monitoring and Managing Government's Environmental Performance*, 102 COLUM. L. REV. 904, 935 (2002).

[76] 16 U.S.C. § 1536(a)(2) (2006).

protected species.

All wind development on federal lands has so far been on lands regulated by the Bureau of Land Management (BLM), whose Interim Wind Energy Development Policy requires that all proposed developments be assessed under applicable NEPA and ESA provisions. This has led to at least one case where a proposal was modified to lessen the potential impact to wildlife identified in the pre-construction assessment.[77] Thus, the federal approach toward wind turbine siting has shown sensitivity to the harmful effects wind power can have on wildlife.

The U.S. Fish and Wildlife Service (FWS) has also adopted interim voluntary guidelines for protecting wildlife from the harms of wind power.[78] These guidelines describe site evaluation protocols and studies to assess and monitor wildlife impacts, and give recommendations for site development and turbine design and operation.[79] Because the FWS is often contacted by states and individual developers for advice about mitigating the effects of wind power on wildlife, these guidelines affect development on private land as well as on federal lands. But since these guidelines are voluntary, some groups are concerned that they will be meaningless.[80] The wind industry, however, argues that, although voluntary, there is a risk that state and local governments will treat them as standards for issuing permits, so that the guidelines become effectively mandatory.[81]

b. *Federal Regulations Applicable to Wind Development on Private Lands*

Although the federal government is not directly responsible

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[77] GAO, PROTECTING WILDLIFE, *supra* note 11, at 31–32.

[78] Memorandum from the Deputy Dir., U.S. Fish and Wildlife Service on Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines (May 13, 2003), *available at* http://www.fws.gov/habitatconservation/wind.pdf.

[79] *Id.* at 1–4.

[80] The Audubon Society supports creating federal incentives to encourage compliance with the guidelines. Daulton testimony, *supra* note 13. *See also* Fry testimony, *supra* note 13 (stating that federal guidelines must be mandatory to affect a difference in protecting birds). U.S. FWS Chief Dale Hall has also called for mandatory wildlife review, concerned that FWS gets involved in wind projects too late to truly protect wildlife. Winter, *supra* note 14.

[81] *See* AMERICAN WIND ENERGY ASSOCIATION, AWEA COMMENTS ON INTERIM WIND/AVIAN GUIDELINES 2, *available at* http://www.awea.org/policy/documents/CommentsUSFWLS12-8-03.pdf.

for siting decisions on private lands, there are federal laws and regulations which might affect such wind turbine siting.

Large wind turbines are governed by Federal Aviation Administration (FAA) requirements which require towers 200 feet and higher to be lit.[82] This is not an environmental regulation, but it does affect the impact of wind farms on the environment. The lighting of towers can attract birds, causing them to fatally crash into the turbines.[83] Because fatality rates depend on the type of lighting used, and red lighting has been shown to significantly decrease fatality rates, regulations permitting (or requiring) red lighting could have a significant impact on migratory wildlife.[84]

On the other hand, the Endangered Species Act (ESA) as well as the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) allow the FWS to protect birds from wind development on private lands.

Section 9 of the ESA prohibits the taking of any endangered species, either directly or through adverse habitat modification.[85] Under Section 11 of the ESA, the FWS may bring civil or criminal charges against those who kill protected species.[86] However, Section 10 of the ESA authorizes the FWS to issue incidental take permits allowing expected takes of endangered species incidental to the activity. To be eligible for an incidental take permit, an applicant must undertake mitigation and create a habitat conservation plan for the species.[87] Together, the penalties and incidental take permits give the FWS a framework under which to work with wind companies to mitigate the effects of wind development on wildlife.

The BGEPA protects bald and golden eagles from being taken

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[82] Federal Aviation Administration, Configuration for Lighting Windmill Farms, http://www.airtech.tc.faa.gov/safety/wind-farm.asp (last visited Apr. 6, 2009); FEDERAL AVIATION ADMINISTRATION, ADVISORY CIRCULAR 70/7460-1K, OBSTRUCTION MARKING AND LIGHTING 33–34 (2007), *available at* https://oeaaa.faa.gov/oeaaa/external/content/AC70_7460_1K.pdf.

[83] *See* Kerlinger, *supra* note 49.

[84] *Id.*

[85] 16 U.S.C. § 1538; Babbitt v. Sweet Home Chapter of Communities for a Great Oregon, 515 U.S. 687, 708 (1995) (upholding the Secretary of the Interior's regulation defining the ESA's prohibition on taking to include "significant habitat modification or degradation where it actually kills or injures wildlife").

[86] 16 U.S.C. § 1540.

[87] 16 U.S.C. § 1539(a).

or sold.[88] Although there are a limited number of purposes for which a permit for taking an eagle may be obtained, there are no "incidental take" permits allowed under this act.[89] This means that there may be no way for wind developers to comply with this law if they want to build where these birds may be found. This law is significant because the large Altamont Pass wind farms kill many eagles each year.[90]

The MBTA prohibits the taking of over 860 species of migratory birds without the authorization of the FWS.[91] Under the MBTA there are no incidental take permits provided for in the statute, only criminal penalties.[92] Since wind turbines in some areas inevitably cause bird deaths, there is no way for wind developers to comply with the BGEPA if they build turbines anywhere the birds covered under the statute are found. So far, the FWS and DOJ have handled violations of this law informally: not through prosecuting violations, but instead by working on mitigation efforts with companies.[93] There is a worry, however, that this could chill wind development because without an explicit way for the FWS to sign off on incidental takes under this statute, companies face uncertainty about whether they may later be prosecuted.[94]

2. *State and Local Regulation of Wind Power*

Most wind power development in the United States is on private land, and so is regulated by the states. In most states, larger developments must obtain permits from an agency regulating utilities and may be subject to zoning laws; smaller projects are primarily regulated under zoning laws.[95] For the most part, states that have explicitly taken wildlife into consideration in wind turbine siting decisions have done so through voluntary

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[88] *See* GAO, PROTECTING WILDLIFE, *supra* note 11, at 33–34.

[89] *See id.*; McKinsey, *supra* note 10, at 76–77.

[90] *See* ASMUS, *supra* note 21, at 138, 240; GAO, PROTECTING WILDLIFE, *supra* note 11, at 37.

[91] *See* GAO, PROTECTING WILDLIFE, *supra* note 11, at 34.

[92] *See id.*

[93] *See id.* at 36.

[94] *See* McKinsey, *supra* note 10, at 92.

[95] JODI STEMLER CONSULTING, 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.

guidelines, which often incorporate the state's environmental statutes.

Each state treats wind turbine siting differently—emphasizing different mixtures of state and local control over the process, creating different levels of protection against NIMBY actions by local governments, and displaying various levels of concern for the environmental impact of wind developments. Because the states take such different approaches, large wind developers investigating sites in multiple states will have to learn a new regulatory landscape for every state in which it is interested.

Below are a few brief examples of approaches taken by different states, demonstrating the factors considered by each state in making siting decisions and the range of approaches taken by the states.

a. *Washington: "One Stop Shopping"*

In Washington,[96] energy facilities (except for hydropower facilities) are licensed through a single agency.[97] Any renewable energy facility in Washington may choose to apply for a siting application with the Washington Energy Facility Site Evaluation Council (EFSEC), but those over 350 MW must apply through this process.[98] This streamlines the licensing process, allowing developers both to bypass local government review and to avoid having to obtain permits directly from state and local agencies.[99] As of June 7, 2006, renewable energy facilities which pass the State Environmental Policy Act checklist are also eligible for an expedited review.[100]

Before submitting a review application, prospective energy developers may ask the council to conduct a preliminary study of the proposed site to determine if there are likely to be any

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[96] As of Dec. 31, 2008, Washington is ranked twenty-fourth among U.S. States by potential wind capacity, but is ranked fifth in existing wind capacity. American Wind Energy Association, U.S. Wind Energy Projects—Washington, http://www.awea.org/projects/projects.aspx?s=Washington (last visited Apr. 6, 2009).

[97] *See* NATIONAL WIND COORDINATING COMMITTEE, STATE SITING AND PERMITTING OF WIND ENERGY FACILITIES 11–12 (2006), *available at* http://www.nationalwind.org/publications/siting/Siting_Factsheets.pdf.

[98] *See id.* at 11.

[99] *Id.* at 11–12.

[100] Washington HB 2402 (2006); NATIONAL WIND COORDINATING COMMITTEE, *supra* note 97, at 12.

insurmountable environmental, social, or regulatory problems.[101] The certification process includes public hearings, review under the State Environmental Policy Act, adjudicative proceedings, review of additional permits, and recommendation to the governor to either approve or disapprove the Site Certification Agreement.[102]

The Washington Department of Fish and Wildlife has issued voluntary wind power guidelines describing baseline and monitoring studies for wind projects, techniques for minimizing wildlife impacts, and outlining mitigation strategies.[103] The guidelines are used by the department for commenting on projects through the State Environmental Policy Act.[104]

b. *Vermont: Public Good Statement*

Wind farms in Vermont,[105] like other energy generation and transmission facilities in the state, must "promote the general good of the state."[106] They are approved based on certification from a Public Service Board that they will achieve this goal. The recommendations of municipal and regional planning commissions, and of municipal legislative bodies, are considered when evaluating whether the facility will interfere with orderly development of the region.[107] Other factors considered are whether facilities will meet present and future demand for electricity which cannot be met more cost-effectively through energy conservation and efficiency, whether they will adversely affect system stability and reliability, whether they will economically benefit the state and its residents, and whether they

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[101] *National Wind Coordinating Committee*, *supra* note 97, at 11.

[102] *Id.* at 11–12.

[103] Washington Department of Fish and Wildlife, *Wind Power Guidelines*, http://wdfw.wa.gov/hab/engineer/windpower/index.htm (last visited Apr. 6, 2009).

[104] STEMLER CONSULTING, *supra* note 95, at 49.

[105] As of Dec. 31, 2008, Vermont is ranked thirty-fourth among U.S. States by potential wind capacity, but is ranked thirty-second by existing capacity. American Wind Energy Association, U.S. Wind Energy Projects—Vermont, http://www.awea.org/projects/projects.aspx?s=Vermont (last visited Mar. 28, 2009).

[106] Vermont Public Service Board Rule 5.400; VT. STAT. ANN. tit. 5 § 248(a) (2000 & Supp. 2008); NATIONAL WIND COORDINATING COMMITTEE, *supra* note 97, at 9.

[107] NATIONAL WIND COORDINATING COMMITTEE, *supra* note 97, at 9; VT. STAT. ANN. Tit. 5 § 248(b)(1).

will have undue adverse effects on aesthetics, historic sites, air and water purity, the natural environment, and public health and safety.[108] This structure means that although local governments can have input into the process—identifying the local costs and benefits—they do not have full control. Wind generation facilities can theoretically be approved over any unreasonable NIMBY motives of communities.

The Vermont Agency of Natural Resources has created draft voluntary Guidelines for the Review and Evaluation of Potential Natural Resources Impacts from Utility-Scale Wind Energy Facilities in Vermont.[109] These guidelines cover pre- and post-construction data assessment and possible mitigation options.[110]

c. *Wisconsin: Model Permit*

Wind power in Wisconsin[111] is regulated at the local level. In 2003, the state designed a draft model wind ordinance which localities could use in crafting their own regulations.[112] The ordinance offers recommendations on dealing with visual appearance, land use issues, audible and tonal noise standards, minimum ground clearance, signal interference, and safety issues.[113] At least one jurisdiction, the Town of New Glarus, Wisconsin, has incorporated the language of the model ordinance

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[108] VT. STAT. ANN. tit. 5 §§ 248(b)(2)-(5).

[109] Draft Guidelines for the Review and Evaluation of Potential Natural Resources Impacts from Utility-Scale Wind Energy Facilities in Vermont (proposed Apr. 20, 2006), *available at* http://www.anr.state.vt.us/site/html/plan/DraftWindGuidelines.pdf.

[110] STEMLER CONSULTING, *supra* note 95, at 47.

[111] As of Dec. 31, 2008, Wisconsin is ranked eighteenth among U.S. States by potential wind capacity, but is ranked fifteenth in existing wind capacity. American Wind Energy Association, U.S. Wind Energy Projects—Wisconsin, http://www.awea.org/projects/Projects.aspx?s=Wisconsin (last visited Apr. 6, 2009).

[112] Draft Model Wind Ordinance for Wisconsin, Oct. 22, 2003, *available* at http://www.maine.gov/doc/mfs/windpower/pubs/pdf/Wisconsin%20Draft%20Model%20Ordinance.pdf. The model ordinance is no longer available on the Wisconsin state website. *See also* Better Plan, Wisconsin, Union Township and the Wind Ordinance that May Save Rock County, http://betterplan.squarespace.com/todays-special/2008/11/18/111808-read-all-about-it-union-township-and-the-wind-ordinan.html (last visited Apr. 21, 2009) (noting the disappearance of the model ordinance from the site).

[113] *Id.*; *see also* NATIONAL WIND COORDINATING COMMITTEE, *supra* note 97, at 14.

in its Wind Generator Ordinance.[114] The Town of New Glarus's ordinance modifies the model ordinance in several ways: it differentiates between personal wind energy systems, intermediate wind energy systems, and major wind energy systems;[115] it modifies the noise restrictions to reduce allowed audible noise levels if the sound produced by the turbines is a repetitive, impulsive sound and to give specific decibel levels allowed at the edge of the project site for different low frequency noises;[116] and it adds provisions on the application procedure,[117] removing abandoned systems,[118] and permits and payments.[119] Except for the expansion of the section on noise and the distinctions made between different sizes of wind systems, the town mostly incorporated the sections it took from the model ordinance as they were written. However, the additions to the model ordinance made by the town suggest that as a model, it does not fully address the needs of local governments in regulating wind ordinances in their communities.

Although the actual siting decision is left to local governments, Wisconsin law addresses the NIMBY problem by prohibiting local governments from restricting the installation of "wind energy systems" (except in the case that the restriction protects public health or safety).[120]

Wisconsin's Department of Natural Resources has also recommended guidelines for siting decisions which suggests that baseline wildlife evaluations be done before a site is approved.[121] They recommend using U.S. FWS guidelines for conducting wildlife studies, and outline mitigation measures to prevent avian deaths.[122]

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[114] Town of New Glarus, Wis., Wind Generator Ordinance #04-2008, ch. 230, §§ 230-1 to 230-11 (July 1, 2008), *available at* http://www.tn.newglarus.wi.gov/docview.asp?docid=4088&locid=158. The sections incorporating the language of the model ordinance are §§ 230-1 to 230-5.

[115] *Id.* at § 230-2.

[116] *Id.* at § 230-5(B).

[117] *Id.* at § 230-6.

[118] *Id.* at § 230-7.

[119] *Id.* at § 230-8.

[120] WIS. STAT. ANN. § 66.0401 (2006).

[121] *See* Wis. Dep't Natural Resources, Considering Natural Resource Issues in Windfarm Siting in Wisconsin: A Guidance, *available at* http://dnr.wi.gov/org/es/science/energy/wind/guidelines.pdf.

[122] STEMLER CONSULTING, *supra* note 95, at 51.

d. *California: Local Land Use Permits*

In California,[123] there is no state permitting agency. Wind power developers must obtain land use permits from local governments.[124]

State and local agencies are required, however, to evaluate the potential environmental impacts of proposed actions under The California Environmental Quality Act.[125] California has developed guidelines to help developers know how to conduct pre- and post-construction wildlife surveys, and what types of animals to look for in different areas. They also provide tips on how to mitigate effects on wildlife.[126] These guidelines are voluntary, but since they are designed to help developers comply with California Environmental Quality Act, they are likely to be followed.[127]

e. *Texas: Unfettered Development*

Texas,[128] the state with the most developed wind capacity, has almost no regulation of wind turbine siting, or its impacts on wildlife. In fact, a recent bill that would have created a permitting process for wind developments requiring certification by the Texas Commission on Environmental Quality and evaluation of impacts on migratory wildlife stalled in subcommittee.[129] The dearth of regulations likely contributes to the swift development of its resource—whereas California currently has 275 MW of wind development under construction, Texas has 1651.35 MW under construction.[130] Counties in Texas can decide to withhold a tax

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[123] As of Dec. 31, 2008, California is ranked seventeenth among U.S. States by potential wind capacity, but is ranked third by existing wind capacity. American Wind Energy Association, U.S. Wind Energy Projects—California, http://www.awea.org/projects/projects.aspx?s=California (last visited Apr. 6, 2009).

[124] CAL. ENERGY COMM'N, CALIFORNIA GUIDELINES FOR REDUCING IMPACTS TO BIRDS AND BATS FROM WIND ENERGY DEVELOPMENT 2 (2007), *available at* http://www.energy.ca.gov/2007publications/CEC-700-2007-008/CEC-700-2007-008-CMF.pdf.

[125] *Id. See also* STEMLER CONSULTING, *supra* note 95, at 17.

[126] *See* CAL. ENERGY COMM'N, *supra* note 124.

[127] *Id.* at 3.

[128] As of Dec. 31, 2008, Texas is ranked second among U.S. States by potential wind capacity, but is ranked first for existing wind capacity. American Wind Energy Association, U.S. Wind Energy Projects—Texas, http://www.awea.org/projects/projects.aspx?s=Texas (last visited Apr. 6, 2009).

[129] H.B. 2794, 80th Leg., Reg. Sess. (Tex. 2008).

[130] American Wind Energy Association, *supra* notes 123 and 128 (listing

abatement, but that is the only outlet for public opposition to developments.[131] This situation means that there is no formal process for public review of siting decisions—local and national concerns about the harmful effects of wind power are left out of consideration in what are purely private decisions. The Texas Parks and Wildlife Department has been involved in some of the larger developments, but since there is no permitting process, they have no formal review position and only serve in an advisory capacity when invited by the developer.[132] Additionally, unlike the other states, Texas has not developed any wildlife guidelines for wind developers to follow.

In recognition of the importance of transmission capacity to the development of wind energy, the Texas Public Utility Commission recently approved a $4.93 billion wind-power transmission project.[133] Lack of transmission capacity has already lead to shutting down turbines even when the wind is blowing. The new lines will connect remote, windy West Texas with the major population centers of the state—Dallas, Houston, Austin, and San Antonio—so that the state can fully use the power generated.[134]

Each state takes its own approach to wind turbine siting—thus creating different levels of protection against NIMBY actions by local governments and providing different levels of protection for migratory wildlife from proposed wind developments (in Texas there is no protection of wildlife). Additionally, this creates a patchwork of regulation for large wind developers to navigate. This is easiest in Texas, where there are no siting requirements, and in states such as Washington that have a centralized regulatory process. However, some states, like California, leave siting decisions to localities. Because the states take such different approaches, large wind developers investigating sites in multiple

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projects under construction as of Dec. 31, 2008).

[131] STEMLER CONSULTING, *supra* note 95, at 45.

[132] *See Texas Parks and Wildlife Commission Public Hearing*, 54–55 (May 25, 2006) (statement of Kathy Boydson), *available at* http://www.tpwd.state.tx.us/business/feedback/meetings/2006/0525/transcripts/public_hearing/.

[133] Kate Galbraith, *Texas Approves $4.93 Billion Wind-Power Project*, N.Y. TIMES, July 19, 2008, at C3, *available at* http://www.nytimes.com/2008/07/19/business/19wind.html.

[134] *Id.*

states will have to learn a new regulatory landscape for every state, and sometimes every county, in which it is interested in developing wind power. Some argue that this variety of standards and requirements diminishes the social welfare by providing sub-optimal protection for national interests in migratory wildlife, and by allowing overly-burdensome regulatory hurdles at the local level.

C. *Issues and Controversies*

The issues surrounding the siting of industrial wind turbines are similar to those that plagued the siting of cellular towers in the nineties, but with the added urgency of avoiding the advancing threat of global climate change. Although the construction of cellular towers could cause habitat damage and the towers are a risk to birds (which die in collisions with lit towers on foggy nights),[135] local opposition to them was seen as harmful to the greater public good. There was a sense that the improved communication capabilities offered by a seamless grid of cell towers was a public good that people were unwilling to pay for if that meant having to suffer the aesthetic impairment of their own neighborhoods—the "not in my back yard," or NIMBY, problem.

Similarly, many national environmental groups are highly supportive of wind development, while local environmental groups are among those fighting specific projects.[136] National groups tout the technology's potential to reduce GHG emissions and mitigate the effects of global climate change, while local groups focus on the environmental impact of wind turbines on birds and the local community.[137] As before, local communities see themselves as being asked to sacrifice for the public good.[138] Some have

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[135] *See* NATIONAL WIND COORDINATING COMMITTEE, AVIAN COLLISIONS WITH WIND TURBINES: A SUMMARY OF EXISTING STUDIES AND COMPARISONS TO OTHER SOURCES OF AVIAN COLLISION MORTALITY IN THE UNITED STATES 11–12 (2001), *available at* http://www.nationalwind.org/publications/wildlife/avian_collisions.pdf.

[136] *See* McKinsey, *supra* note 10, at 88.

[137] *See* Felicity Barringer, *Debate Over Wind Power Creates Environmental Rift*, N.Y. TIMES, June 6, 2006, at A18, *available at* http://www.nytimes.com/2006/06/06/us/06wind.html.

[138] Of course, not every community feels like wind power is a sacrifice. Some welcome wind turbines for the economic and environmental benefits. *See* Richard Stenger, *Midwest Farmers Harvest Bumper Crop of Wind Power*, CNN, June 14, 2000, http://archives.cnn.com/2000/NATURE/06/14/wind.power/ (last visited Apr. 6, 2009); *see also* Liz Hoffman, *Growing Power of Wind: Hull is*

suggested that this shows that local groups do not oppose wind development because of genuine environmental concerns, but are instead acting out of NIMBY sentiments.[139]

This may, however, be an oversimplification of the problem. In a recent article about a failed proposal for a wind development in the scenic Texas Hill Country, a local resident characterized wind developers thusly: "[They] try to portray themselves as part of the green revolution, . . . [b]ut when you see where wind turbines have lined a ridge top, they obliterate the landscape."[140] This sentiment is not just an outbreak of "not in my backyard" reactions, but expresses a genuine interest in the value of wild landscapes and highlights a fundamental schism when it comes to evaluating the environmental bona fides of wind power. Many people become environmentalists because they want to preserve scenic views and wild spaces, free of obvious trappings of human civilization. The preservation of the environment for aesthetic purposes is even recognized nationally in Section 101(b)(2) of NEPA, which says that the nation should "assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings."[141] There may be cases where the benefits to the world in mitigating climate change from a particular wind project do not outweigh the costs to the local community in preserving a specific landscape.[142] The federal government is unlikely to be able to make such nuanced decisions and is likely to over-promote wind development to the detriment of societal welfare.

However, in the case of cellular towers, the federal government decided that the national interest in communication outweighed local concerns and passed the Federal

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Leading the Clean Power Revolution, and Other Towns on the South Shore are Following, QUINCY PATRIOT LEDGER, Sept. 25, 2008, at 11.

[139] Barringer, *supra* note 137. ("There's no free lunch, . . . '[n]ot in my backyard' is not environmentalism." (internal quotations omitted)).

[140] Vicki Vaughan, *Blurred View of Paradise?*, SAN ANTONIO EXPRESS-NEWS, Nov. 15, 2007, at 1A.

[141] National Environmental Policy Act § 102, 42 U.S.C. § 4331(b)(2) (2000). *See also* Barringer, *supra* note 137 ("Wilderness conversations are spiritual." (internal quotations omitted)).

[142] *See* Barringer, *supra* note 137 ("I'm not sure that wind turbines in this region will significantly reduce the outcome of global climate change or actually have any role. . . . The very limited benefit doesn't justify the risk of wiping out a lot of interior forest habitat." (internal quotations omitted)).

Telecommunications Act of 1996, which severely limits the ability of local governments to prevent the erection of cell towers.[143] Similarly, the nation may decide that the risks to local communities by making these decisions at the national level may be overwhelmed by the risks to the country if they are not.

In the following two sections I will discuss the factors academics have suggested should be considered when evaluating which level of government will best regulate a given environmental problem, and how those factors suggest the siting of wind turbines should be treated.

II. HOW TO EVALUATE WHICH LEVEL OF GOVERNMENT WILL BEST REGULATE ENVIRONMENTAL PROBLEMS

In the United States, activities can be regulated at the federal, state, or local level (or some combination of the three). Additionally, activities may not be regulated by the government, but left up to market forces and checked by private law (such as tort and nuisance). Academics have determined several factors to use in evaluating whether regulation should be centralized at the federal level, decentralized at the state or local level, or left unregulated.

A. *Why Regulate?*

Use of land for industrial purposes has long been a regulated activity, out of the belief that the public should be protected from the unusually harmful, and often annoying activities of industry.[144] Since utility-scale wind turbines are large industrial machines, the rationales supporting regulation of other industrial facilities apply to them as well: some may consider them noisy and unsightly nuisances, and there is a risk they could endanger the health and safety of those living and traveling nearby if they break apart in high winds or catch fire.[145]

In addition, industries are often regulated to improve or

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[143] Telecommunications Act of 1996 § 704(a)(7), 47 U.S.C. § 332(c)(7) (2000).

[144] *See, e.g.*, Village of Euclid v. Ambler Realty Co., 272 U.S. 365, 387–88 (1926) (analogizing land use regulation to common law nuisance restrictions).

[145] *See* Simone Kaiser and Michael Fröhlingsdorf, *The Dangers of Wind Power*, DER SPIEGEL ONLINE, Aug. 20, 2007, http://www.spiegel.de/international/germany/0,1518,500902,00.html (last visited Apr. 9, 2009).

preserve the environment. First, most environmental issues in the public consciousness involve public goods. Public goods are non-rivalrous and non-excludable, which means that they cannot be divided into private property holdings.[146] Therefore, public goods, such as the value of migratory wildlife and the abatement of global warming, are difficult to defend through private law, such as nuisance, which protects property rights.

Furthermore, because harm to a public good is diffusely spread throughout the public, rather than concentrated on the individual actor, the benefits of action to that individual outweigh the costs to that individual. Particularly in the climate change context, the fact that the effects of GHG emissions today may be felt for generations to come means that actors are likely to underestimate the future costs to others and overestimate current benefits to themselves. So, an actor has little individual incentive to prevent environmental harms. This is even more significant when the actor is a foreign company and the public good in question is the existence of a domestic species. The proposed wind developments on the Kennedy Ranch along the Texas Coast are an example of this. The companies developing the resource claim to have done exhaustive environmental surveys that show their project will not unduly harm wildlife.[147] The chief development officer for Babcock & Brown, Ltd., an Australian company developing wind power on the Texas coast, explained that their project is "trying to create energy to support 100,000 homes, and that's a lot more valuable than a few incidental takes of birds. There's always a price."[148] There may always be a price, but since it is the local public and not the corporation that will be paying that price, the company is unlikely to correctly decide whether the power generated is worth the costs to indigenous animals. Although less stark, this is true for domestic companies as well; the mandate of corporations is to maximize profits for shareholders, not to promote the social welfare. Texas is letting private development companies, not the public, make the tradeoff between renewable energy and the value of migratory birds.

Because private actors are unlikely to internalize the full

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[146] *See* Daniel C. Esty, *Revitalizing Environmental Federalism*, 95 MICH. L. REV. 570, 582 (1996).

[147] John MacCormack, *Will Wind Power be the Next Kennedy Moneymaker?*, SAN ANTONIO EXPRESS-NEWS, June 17, 2007, at 1B.

[148] *Id.*

effects of their actions on the local community and environment without regulation, it is appropriate and necessary to regulate the siting of wind turbines to protect public health and safety, and ensure that the industry's full effects on the environment are not ignored.

B. *Initial Presumptions*

Once the decision that a given area should be regulated is made, the next question is which level of government will best maximize social welfare through its regulations of that area. In evaluating the optimal governmental level for making environmental decisions, academics disagree on whether one should begin from a presumption of decentralized (local or state) decision making or centralized (national) decision making.

Some suggest starting with a presumption in favor of decentralization based on the site-dependent nature of costs and benefits and the idea that preferences for environmental quality may vary regionally.[149] This presumption is rebuttable, however, in the presence of "systemic evils" (such as the presence of inter-government externalities, economies of scale, public choice problems, and the "race to the bottom") that might make centralized regulatory authority more efficient than a decentralized system would be.[150]

In contrast, others argue that centralization of environmental regulation is preferable because it creates economies of scale, internalizes interstate externalities, may prevent public choice problems, and allows moral principles to be defined.[151] This presumption can also be rebutted when characteristics of the system (such as internalities, diseconomies of scale, and public choice problems) indicate that decentralization would be more efficient.[152]

In this note, I start from a presumption of decentralization in regulating wind power facilities for three primary reasons. First, many of the benefits and costs of wind power are site-specific, which supports regulation at the local level: the land owner

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[149] Richard L. Revesz, *The Race to the Bottom and Federal Environmental Regulation: A Response to Critics*, 82 MINN. L. REV. 535, 536 (1997).

[150] *Id.* at 537.

[151] Esty, *supra* note 146, at 603–05.

[152] *See* Esty, *supra* note 146, at 590.

receives rental income for allowing the development on her land; the local community collects higher taxes due to the increased property value from the development; the local environment and landscape aesthetics are disrupted; and local geographic features determine the effect turbines will have on migratory wildlife. Second, the regulation of land-use has traditionally been done at the local level.[153] Third, the current regulatory scheme is decentralized, so we should avoid the transition costs of changing the jurisdiction of regulation in the absence of a compelling reason to change. The paper then explores why the following factors justify centralizing only some aspects of wind turbine siting, while leaving other aspects to more decentralized regulation.

C. *Factors to Consider in Evaluating Which Level of Government Would Best Regulate a Given Environmental Problem*

When evaluating which level of government is best suited for regulating a particular industry or environmental problem, academics have identified several factors which should be taken into consideration. First, the "size of the public" involved in regulating should be set so that externalities are internalized and internalities are avoided. Second, in recognition of economies of scale, regulation should be made at a level which avoids the expense of duplicating efforts in information gathering and analysis. Third, regulation should be at the level which best prevents internal politics from resulting in sub-optimal regulation (public choice problems). Finally, regulation should be handled at a level which prevents inter-jurisdictional competition causing a "race to the bottom."

The optimal level of government for regulating a given problem may be different depending upon which factor is being evaluated, so the answer may not always be clear. In this case, it makes sense to distinguish, if possible, among various aspects of the issue and regulate each at the appropriate level of government. This paper does not attempt a formal empirical analysis of all of the factors of wind power. The primary focus is on exploring the range of environmental factors which could justify regulation by the federal government.

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[153] *See, e.g.*, Village of Euclid, 272 U.S. at 387.

1. *Externalities/Internalities*

It is important to scale regulatory programs at the level best able to evaluate all the costs and benefits of the regulated action. If the scale is too large and centralized, the program may not take into account local needs and conditions (which creates internalities);[154] when it is too small and decentralized, the regulation may not properly account for costs and benefits that accrue outside of the regulator's jurisdiction (which creates externalities).[155] So, if there are significant costs or benefits external to the state or local government regulating an environmental area, this might justify the national government taking over regulation of that area.

Merely identifying that there are externalities that could justify federal participation in regulation is not enough, however, because when control of regulation is centralized to address externalities, this can create internalities that will not be properly considered at the federal level.[156] Thus, if possible, federal regulation should be targeted at the specific problem represented by the externality, and if federal programs are unable to directly address the particular externalities at work within a specific decision-making context, there is no justification to move toward centralized regulation.[157]

2. *Economies of Scale*

Economies of scale justify central regulation when that centralization of regulatory functions saves resources by preventing duplication of efforts. It is wasteful to have every locality or state spend their resources investigating the same problem in this case.[158] Additionally, many environmental problems require highly technical analysis, and smaller levels of government are unlikely to have the expertise (or the funds) to tackle these issues.[159]

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[154] "[I]nternalities arise if a subjurisdiction would opt out of acquiring a particular public good but is forced to pay for an unwanted level of environmental protection by a decision made at a higher level of government." Esty, *supra* note 146, at 589.

[155] *See id.* at 587.

[156] *See id.* at 589.

[157] *See* Revesz, *supra* note 149, at 540–41.

[158] Esty, *supra* note 146, at 614–15.

[159] *Id.*

This rationale may be strongest for some data collection and analysis: when each government unit would otherwise be doing essentially the same work, this duplication wastes resources. On the other hand, in the setting of standards, the costs saved by having only one entity set the standard may be offset or overwhelmed by the costs accrued by properly tailoring that standard, or by that standard being over-inclusive.[160]

When the environmental problem involved is strongly determined by local factors, this may also weigh against federal regulation of the problem. Some problems involve local data collecting where data varies greatly in response to local conditions.[161] Also, because expertise may lie with local governments, it could be more expensive for the federal government to fully investigate the problem than it would be for local units.[162]

Some argue that there are no economies of scale in studying environmental problems at the national level because there is value in retaining a decentralized approach toward solving environmental problems, so that the states act as "regulatory laboratories."[163] Since each state may approach the problem in a different way, they would not be duplicating efforts, but performing many experiments at once. This might uncover a superior approach in a shorter amount of time.

In sum, regulations should be made, and analyses done, at the level of government that is most efficiently and effectively able to do so.

3. *Public Choice Problems*

When a given jurisdiction is unable to translate its public's desires into appropriate regulations, this is a public choice problem.[164] This may happen when the opponents of environmentally protective measures are more vocal than its proponents because the costs of regulation are less diffuse than the benefits, or when a jurisdiction undervalues environmental benefits

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[160] Revesz, *supra* note 149, at 543–44.

[161] *See* Jonathan H. Adler, *Jurisdictional Mismatch in Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 130, 145–47 (2005).

[162] *See* Esty, *supra* note 146, at 617.

[163] *See id.* at 615.

[164] Esty, *supra* note 146, at 597.

because the economic costs of regulation are easier to quantify, evaluate, and weigh than the environmental benefits.[165]

However, it is unclear whether these problems are more or less likely at the federal level than at the state level.[166] In practice, states often adopt stricter environmental standards than the federal government. California's auto emissions standards, for example, are much stricter than the standards demanded by the federal Clean Air Act.[167]

Thus, there is no justification to centralize regulation unless there is a demonstrated public choice problem in state or local governments, or a demonstrable improvement in the federal government.

4. *Race to the Bottom*

When jurisdictions compete for industrial development by strategically lowering environmental standards, thereby harming social welfare in a "race to the bottom," this may be an argument for federal regulation of environmental issues.[168] Federal regulation in such cases could eliminate interstate competition using environmental standards, thus preventing them from being sub-optimally lax.

Others argue, however, that if states will not compete using environmental standards, they will compete instead by weakening other welfare-enhancing regulations. So, if the race to the bottom is a concern, whether or not the federal government controls environmental regulation, social welfare will be reduced when states are in control of any regulation.[169] Additionally, some have questioned whether the race to the bottom really occurs.[170]

So, if there is reason to worry that states will use a reduction in environmental protection to compete with one another for industrial wind development, this could be a reason to increase federal regulation.

In the following part, I evaluate whether the preceding factors

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[165] *Id.* at 597–98.

[166] Revesz, *supra* note 149, at 542.

[167] Richard L. Revesz, *Federalism and Environmental Regulation: A Public Choice Analysis*, 115 HARV. L. REV. 553, 588 (2001); *see also* Adler, *supra* note 161, at 154–57.

[168] Esty, *supra* note 146, at 628.

[169] Revesz, *supra* note 149, at 540.

[170] *Id.* at 538–39; *see also* Adler, *supra* note 161, at 151–54.

could justify moving regulation of wind turbine siting (or certain aspects of it) from state and local control to federal control. This section is intended only to identify and briefly discuss the general factors that are implicated in siting wind farms in general. It is beyond the scope of this paper to perform a full, quantitative cost-benefit analysis, which would need to be done on a project-by-project basis.

III. APPLYING ACADEMIC ARGUMENTS TO THE SITING OF WIND TURBINES

A. *Factors to Consider in Evaluating Which Level of Government Should Regulate Wind Turbine Siting*

1. *Externalities/Internalities*

When wind turbine siting decisions are left at the local level, there are several externalities at play: The benefits from electricity production (electricity users) often accrue to those who do not live near electricity generation facilities (wind turbines); the reduction of air pollution from displacing traditional energy generation plants; the positive effects of wind power on climate change; and the impact of wind power on migratory wildlife. Yet, when wind turbine siting is done at a larger level, this creates internalities: all of the effects on the local environment, local aesthetics, and the economic benefits of development that aren't addressed by decision-makers at the higher level. If the damage to social welfare from the local government ignoring externalities is likely to be greater than that from the more centralized government ignoring internalities, this may be a reason to restrict local control of siting decisions.

However, before determining that these externalities justify central regulation, it is important to explore each issue and contemplate the appropriate scale of regulatory response, because the mere existence of an externality does not in itself necessitate federal control of the entire action in question. There may be things that the federal government can do to cause local jurisdictions or the wind industry to internalize external costs, yet otherwise maintain control of the decision.

a. *Electricity Demand as an Externality*

Federal energy regulations require utilities to allow "wheeling," or the transmission of power from one utility to flow through the transmission lines of a second utility on its way to a third.[171] Through wheeling, power can be generated in one area, pass through a second, and be delivered to customers in a third. This enables a broader market for electricity, so that the end users may be far from the initial generation station. This is especially true for wind energy, where users may be concentrated in urban areas, while wind production facilities are primarily located in rural areas. Thus, those who use wind power do not suffer any of the local environmental costs of its production.

But, because regulation is done at a local level, the market possibilities may not be fully realized in local siting decisions. For example, North Dakota, the state with the greatest potential for harnessing wind power, is ranked only 11th for power capacity generated from wind by existing projects.[172] It generates an amount equal to just over 9 percent of the existing capacity of Texas, the state with the second greatest potential for generating wind power and the state with the most existing capacity for wind power generation.[173] North Dakota may be lagging behind Texas because its population is much less than that of Texas, and it may not have needed additional electricity development to meet demand in the state. The low population of the state, combined with limited transmission capability from the Dakotas to major population centers,[174] may cause development of electric generation capacity in general (not renewable energy in particular) to proceed more slowly than in other states.[175] Thus, the growing national demand for clean electricity production has not impacted this state. However, this may soon change. North Dakota has

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[171] Brumberg, *supra* note 21, at 701–02.

[172] American Wind Energy Association, U.S. Wind Energy Projects—North Dakota, http://www.awea.org/projects/Projects.aspx?s=North%20Dakota (last visited Nov. 5, 2008).

[173] American Wind Energy Association, *supra* note 128.

[174] National Wind, LLC., North Dakota Wind Facts, http://www.nationalwind.com/north_dakota_wind_facts (last visited Apr. 6, 2009).

[175] The population density of Texas was 90 people per square mile and North Dakota's was 9.2 people per square mile for 2006. U.S. Census Bureau, Cumulative Estimates of Population Change for the United States and States, and for Puerto Rico—April 1, 2000 to July 1, 2006, *available at* http://www.census.gov/popest/gallery/maps/Maps_State2006.xls.

joined with Iowa, Minnesota, Wisconsin and South Dakota to form a regional transmission planning initiative which will coordinate the development of additional transmission capacity so that these states may increase wind production.[176]

This externality may justify widening the siting decision to the state, or regional grid level. In contrast, because there is not yet a national market in electricity, it is not justification for national regulation, despite the fact that current transmission decisions are made at the national level.[177] Creating regional, grid-level regulating bodies could encourage electricity development in windy, less populous states to supply the growing needs of other areas within their electricity market, maximizing the social welfare of the nation as a whole while bringing cleaner energy to the parts of the country that need it and economic development into North Dakota.

b. *Air Pollution as an Externality*

In comparison to more traditional sources, producing electricity from wind power contributes negligible amounts of traditional pollution affecting air quality. When electricity produced from wind displaces electricity production from coal fired power plants, this reduces the air pollution that would have resulted from traditional energy generation methods. Since it is unlikely that wind turbines will be erected exactly where a traditional power plant is located or would have been located, this means that most of the air quality benefits will be felt outside the locality where the turbines could most efficiently be placed.

However, this externality does not justify national control. The pollution from an individual traditional power plant affects air

[176] Press Release, Gov. John Hoeven, Regional Initiative Focuses On Wind Energy Expansion Upper Midwest Transmission Development Initiative to Address Need for Regional Cooperation on Electric Grid Expansion to Support Wind Energy Resources (Sept. 18, 2008), *available at* http://governor.nd.gov/media/news-releases/2008/09/080918.html.

[177] However, there have been recent calls for developing a "high-voltage backbone spanning the country" to improve transmission of wind power from low-population, high-wind areas, to high-population, low-wind areas. *See* Matthew L. Wald, *Wind Energy Bumps Into Power Grid's Lines*, N. Y. TIMES, Aug. 27, 2008, at A1, *available at* http://www.nytimes.com/2008/08/27/business/27grid.html. If the national grid were improved to allow transmission of electricity throughout the country and thus, a national electricity market, this might warrant national regulation.

quality only locally or regionally, not nationally. Furthermore, since the electricity grids are regionalized, a wind power facility can only displace power from traditional fuels within its grid. As a result, air quality improvements will only be felt in areas affected by power plants within the grid. Thus, similar to the externality of energy demand, this does not mandate regulation by the federal government, but rather by states, or regions at the highest.

c. *Climate Change as an Externality*

The mitigating effects of wind power on climate change are a classic example of a positive externality. Global climate change is the result of millions of individual actions and affects everyone, so the full benefits of developing wind power as one component of a GHG reduction plan are not felt within the jurisdiction and may be undervalued in comparison to more fully local concerns. Theoretically, because the jurisdiction incurs most of the environmental costs of wind turbines (noise, destroyed landscapes, land use disruption), but only a fraction of the benefits of increasing production of wind generated electricity (reduction of ill effects of climate change from GHG emissions, possibly higher tax revenue, increase in construction jobs during the erection of the turbines), it will overvalue the costs of wind production and undervalue the benefits. This will lead to the production of less wind power than would be preferable to maximize social welfare.

It is important to decide correctly the scale of the justification for moving away from the presumption in favor of decentralization to a regime of federal control. The presence of an externality gives a justification for the federal government to solve the problem of that externality and no more.[178] The positive externality of mitigating the effects of climate change is not sufficient justification for the federal government to assume control of all decisions concerning windmill siting. Rather, it points to a need for federal intervention to correct any market failures due to the presence of the externality, in this case to help local jurisdictions internalize the benefits of reducing GHG emissions. Indeed, because the causes and effects of climate change are a global problem, this may be a justification to address the market failures related to climate change at the international level. However, although the siting of wind turbines implicates global effects on

[178] Revesz, *supra* note 149, at 540–41.

climate change, land use is a deeply local issue and wind turbines have many effects that are primarily felt at the local level. Thus, climate change externalities are not a justification for moving all aspects of the siting decision to federal or global control.

Although, according to the U.S. Department of Energy, wind power has the potential to meet America's current electricity consumption[179] without the emission of GHGs and could be an important tool in the fight against global climate change, it is not the only way to achieve the benefits of slowing or eliminating climate change. If wind power were the only way to prevent global warming, it might be better to risk overdevelopment of wind through centralized regulation than overprotection of landscapes through decentralized regulation. However, it isn't, and the true national interest is not in promoting wind power, but in mitigating global climate change through the reduction of net GHG emissions. So, the theoretically appropriate regulatory response to this externality is not to wrest wind turbine siting from the control of local governments, but to regulate the problem of GHG emissions in a way that allows local jurisdictions to internalize the benefits of net GHG emission reduction.

d. *Wildlife as an Externality*

The final major externality in the wind power context is the effects of wind power on migratory wildlife. The concern is that since migratory birds and bats may only be passing through the jurisdiction where wind turbine siting decisions are being made, harm to these animals will be undervalued or not taken into account at all when siting decisions are made. The immediate, local benefits to property owners (from leasing fees) and to counties (from the increased property tax base) could easily overwhelm any considerations of harms to migrating wildlife. So, the negative externality of harm to migratory wildlife could be a justification for moving siting decisions, or at least those concerning threats to wildlife, to the federal government. In fact, this externality is already an accepted justification for the nation's laws concerning wildlife: the Endangered Species Act, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. Review of siting proposals for their impact to wildlife could be done as an extension of these laws.

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[179] Department of Energy, *supra* note 7.

However, even if the regulatory authority given to the federal government is restricted to overseeing the impacts of wind operations on wildlife, it could be that the species harmed by a proposed wind project are primarily of local value and that there is little national interest in protecting them. (For example, the habitat of local, ground-dwelling animals can be destroyed or disrupted by wind farm construction or operation.)[180] Additionally, some species which are harmed by wind power, such as bats, have not previously been protected under federal law[181]—so federal agencies concerned with wildlife, which would focus primarily on ensuring that wind projects comply with federal statutes, may not pay attention to them. In these cases, where there are wildlife internalities, federal regulations concerning the interaction of wind technology and wildlife may be under-protective of local interests. So, there is a theoretical justification for federal minimum standards concerning migratory species, but not complete control of the process. This would allow states to add protection for wildlife not of national interest.

2. *Economies of Scale*

a. *Standardization of Regulations*

Economies of scale are generally not a rationale for moving standard-setting to the federal level. Although a centralized, streamlined approach could promote further industry growth by making the siting process more easily navigated, this does not, by itself, justify federal control of wind turbine siting.[182] This holds true especially for wind turbine siting, because their negative environmental effects (to habitat and migratory wildlife) are highly contextual.

b. *Economies of Scale in Information Gathering?*

For certain information-gathering tasks, it takes fewer resources for a centralized agency to accomplish them than it would for each state or locality to address the problem

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[180] For example, studies show that the Lesser Prairie Chicken will not breed or raise young within 0.5 miles of some vertical structures. *See* Statement of Kathy Boydston, *supra* note 132.

[181] GAO, PROTECTING WILDLIFE, *supra* note 11, at 4.

[182] Dinnell, *supra* note 45, at 587.

individually. This could be true in determining the design of wind turbines and siting techniques best suited to prevent wildlife collisions. Additionally, since migratory wildlife moves across state lines, the federal government may have an easier time taking the cumulative effect of all wind power developments into account when they examine the harms to wildlife in making siting decisions.

But, the impact of wind turbines on wildlife is highly site-specific. A 2005 Government Accountability Office (GAO) report on the impacts of wind power on wildlife highlights the information-gathering difficulties of a centralized regulatory scheme.[183] This study found that there is a dearth of information about the species that are most impacted by wind power. Information that might best be studied centrally, such as the migratory paths of birds and the behavior of bats, is greatly lacking.[184] Before the national government would be able to craft good general guidelines for the siting of windmills to protect wildlife, it would need to conduct massive studies to fill in these information gaps. It also found that the results from studies done in one location cannot, for the most part, be extrapolated to other locations, because of the variance in topography, species density, and the types of turbines used.[185] Because it is so site-specific, the federal government's costs of gathering information needed to determine exactly when and where species of concern are threatened by proposed wind development sites might be higher than if done at the local level. This suggests that the impacts of wind power on wildlife may best be studied at the local level, and thus that consideration of how best to protect wildlife at any given site would best be made at the local level.

c. *Expertise and Economies of Scale*

Although the effects on wildlife are highly site-specific, and thus most appropriately analyzed at the local level, many states and local governments do not have the expertise to carry out the needed assessments themselves. The GAO found that some states are relying on the public commenting process to bring problems to their attention because they do not have the expertise to evaluate

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[183] GAO, PROTECTING WILDLIFE, *supra* note 11, at 3.
[184] *Id.*
[185] *Id.*

the problems themselves, and that states and wind power developers have come to the FWS for help in assessing and mitigating harmful effects to wildlife.[186] Unfortunately, FWS has reported that it does not have the staff to keep up with the requests for its assistance.[187]

The FWS is ill-equipped to deal with the demand for its services because the only wind power construction it has direct responsibility over is the small amount developed on federal lands. Perhaps if it were given responsibility for overseeing all wind development, it could be allocated the resources it needs for fulfilling this responsibility. But if it were not given additional resources to meet this expanded duty, then wildlife may actually be shortchanged by moving the responsibility for protecting it to an overworked, understaffed agency.

3. *Public Choice*

Because political realities may preclude governments from regulating the way we would expect them to theoretically, it makes sense to evaluate whether states and local governments are ignoring externalities as predicted, and whether the federal government is doing a better job than the states at taking them into account in its actions in other areas. This section focuses primarily on evaluating their respective approaches toward climate change and migratory wildlife because there is a theoretical rationale for regulating these aspects of siting at the federal level.

a. *Public Choice Problems Concerning Climate Change*

The benefits of wind power in mitigating climate change are diffuse and mostly external to states, so, theoretically, the federal government would do a better job of accounting for those benefits in regulation than the states would.

i. States and Climate Change

The positive effects on global climate change are external to state and local jurisdictions that are currently making decisions on whether to authorize wind power generating facilities on private lands in the United States. The presence of this positive externality would lead us to expect that states would be letting

[186] *Id.* at 23, 35.
[187] *Id.* at 35.

parochial concerns and values overwhelm the consideration of global benefits from wind power and slowing its adoption. This is not true for many states.

One way that states are addressing climate change concerns is through the regulation of electricity production. One approach for encouraging the increase of renewable energy sources is through the use of renewable portfolio standards (RPS). Renewable portfolio standards are used by states to require "electricity providers to obtain a minimum percentage of their power from renewable energy resources by a certain date."[188] Utilities account for their required percentage of renewable power generation by holding tradable renewable energy credits representing their share.

Currently, at least twenty-eight states have set RPS policies,[189] and the states which have adopted RPS policies represent more than 50 percent of total energy sales in the United States.[190] Importantly, although RPS policies are targeted at "renewable" rather than "clean" energy sources (which means that they would not necessarily reduce GHG emissions if dirty but renewable resources were allowed to count),[191] RPS policies do seem to be correlated with the promotion of wind development: the ten states with the most existing wind generation capacity have all set renewable portfolio standards.[192] This shows that many states are

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[188] Department of Energy, States with Renewable Portfolio Standards http://www.eere.energy.gov/states/maps/renewable_portfolio_states.cfm (last visited Apr. 6, 2009).

[189] States with renewable portfolio standards: Arizona, California, Colorado, Connecticut, Delaware, Hawaii, Illinois, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Texas, Vermont, Washington, Wisconsin. Pew Center on Global Climate Change, Renewable Portfolio Standards, http://www.pewclimate.org/what_s_being_done/in_the_states/rps.cfm (last visited Apr. 5, 2009). The District of Columbia has also set a renewable portfolio standard. *Id.*

[190] U.S. Department of Energy, *supra* note 188.

[191] For example, some question whether the production of energy from biofuels, which are often listed as a "renewable" resource in RPS policies, decreases or increases net GHG emissions. *See* Alan Zarembo, *Biofuel May Raise Carbon Emissions*: *Converting Land for the Crops Offsets the Benefit, Studies Say*, L.A. TIMES, Feb. 8, 2008, at 19, *available at* http://articles.latimes.com/2008/feb/08/science/sci-biofuel8.

[192] The top ten states in order of most to least existing wind power generation capacity are: Texas, California, Minnesota, Iowa, Washington, Colorado, Oregon, Illinois, Oklahoma, New Mexico. *See* American Wind Energy Association, *supra* note 41. All but Oregon have set renewable portfolio standards. *See* U.S. Department of Energy, *supra* note 188.

taking real and effective efforts to reduce GHG emissions.

States have also been active in adopting programs to combat climate change in other ways. On November 15, 2007, the governors of nine Midwestern states and the premier of Manitoba signed the "Midwestern Regional Greenhouse Gas Reduction Accord."[193] This makes the Midwest the third region where states have entered into regional agreements to combat GHG emissions: the Regional Greenhouse Gas Initiative, announced on December 20, 2005, unites Northeastern and Mid-Atlantic states in an effort to reduce carbon dioxide emissions through a cap-and-trade program,[194] and the Western Climate Initiative, launched in February 2007, brings together six Western states and two Canadian Provinces in an effort to "identify, evaluate, and implement . . . ways to reduce greenhouse gases in the region."[195] This shows that although there are externalities at work in the climate change context, this has not caused states to be unmindful of how their actions contribute to the problem.

However, a state commitment to GHG emission reduction may not be enough. Even in states which have expressed a commitment to developing alternative energy sources, if local governments control wind turbine siting decisions, then projects may be unreasonably blocked. For example, Wisconsin's energy policy is that "to the extent that it is cost-effective and technically feasible, all new installed capacity for electric generation in the state be based on renewable energy resources."[196] But Wisconsin only subjects large projects (those over 100 MW) to regulation at

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[193] Midwestern Governors Association, Midwestern Regional Greenhouse Gas Reduction Accord, *available at* http://www.midwesterngovernors.org/Publications/Greenhouse%20gas%20accord_Layout%201.pdf. Signed by the governors of Minnesota, Wisconsin, Illinois, Indiana, Iowa, Michigan, Kansas, Ohio and South Dakota, and by the premier of Manitoba. Press Release, Midwestern Governors Ass'n, Governors Sign Energy Security and Climate Stewardship Platform and Greenhouse Gas Accord (Nov. 15, 2007), *available at* http://www.midwesterngovernors.org/govenergynov.htm.

[194] Regional Greenhouse Gas Initiative, http://www.rggi.org/ (last visited Apr. 7, 2009). The Initiative finished its first auction on Sept. 25, 2008, selling over 12.5 million carbon dioxide credits at $3.07 per ton. *See* Regional Greenhouse Gas Initiative, Auction Results, http://www.rggi.org/co2-auctions/results (last visited Apr. 7, 2009).

[195] The initiative includes Arizona, California, New Mexico, Oregon, Washington, British Columbia and Manitoba. Western Climate Initiative, http://westernclimateinitiative.org/Index.cfm (last visited Apr. 7, 2009).

[196] WIS. STAT. ANN. § 1.12 (2006).

the state level—smaller projects are regulated at the local zoning level.[197] So although Wisconsin law prohibits local governments from restricting the installation of "wind energy systems" (except in the case that the restriction protects public health or safety[198]), it has left local governments the ability to determine setback distances and sound output restrictions. This creates an opportunity for localities to put restrictions on wind developments that effectively prohibit commercial wind operations from being developed.[199] At least three counties in the state have used this ability to set requirements so stringent that no commercial wind would be possible.[200] This situation, though, does not justify a greater role for federal regulation, but for the state to set guidelines to prevent local governments from acting unreasonably to restrict the development of such resources.

But, although many states have taken steps to include the effects of climate change in their decision-making processes, and thus may not need federal intervention to force them to do so, not all states have dedicated themselves to reducing their impact on global climate change. For example: North Dakota, unlike Texas, has not adopted a renewable portfolio standard,[201] and it is one of three Midwestern states whose governors did not sign onto the Midwestern Regional Greenhouse Gas Reduction Accord.[202] Although local interests may genuinely outweigh the benefits of wind development in the region, it is unlikely. This suggests that there is room for federal regulation to play a role in siting wind turbines by encouraging the states lagging behind the alternative energy revolution to catch up.

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[197] *See* WIS. STAT. ANN. § 196.491 (2006). Utility scale turbines are those with a greater than 100 kilowatt capacity, but most utility-scale turbines are much larger, in the 700-kW to 2.5-megawatt range. Therefore, a wind development may have over a hundred turbines and still not reach the 100 MW cut-off. American Wind Energy Association, Wind Web Tutorial, http://www.awea.org/faq/wwt_basics.html (last visited Apr. 7, 2009).

[198] WIS. STAT. ANN. § 66.0401 (2006).

[199] Michael Vickerman, *Eliminate Roadblocks to Wind Power*, WIS. STATE J., Sept. 2, 2007, at C2.

[200] *Id.*

[201] *See* Department of Energy, *supra* note 188.

[202] Thomas Content, *Emissions Pact Wins Backing: Six Midwest Governors to Sign Accord*, MILWAUKEE J. SENTINEL, Nov. 15, 2007, at A1.

ii. Federal Government and Climate Change

Because the effects of climate change are more fully felt at the national level than at the state level, national policies should be more protective of this interest than state policies are. However, this doesn't seem to be the case.

The federal government gives important subsidies to electricity producers which have a profound effect on wind energy development. In a study of federal electricity subsidies over the period from fiscal year 2002 through fiscal year 2007, the GAO found that of fuel types used for electricity (nuclear, fossil fuel, renewables), fossil fuels by far receive the most government subsidies through tax expenditures.[203] Throughout the period, subsidies for fossil fuels were almost five times that of subsidies for renewables, and money spent on research and development of fossil fuels was more than double that spent on renewables.[204] However, it also found that while tax expenditures on fossil fuels increased 43 percent over the six-year period, expenditures on renewable energy sources increased 232 percent, and while the amount spent on research and development of fossil fuels remained relatively steady, the amount spent for research and development of renewables increased 33 percent during the same period. So, although the United States government is subsidizing fossil fuels far more than renewables, it is increasing the amount spent on renewables at a faster rate than that spent on fossil fuels, which is an encouraging sign for the mitigation of climate change.

Furthermore, the federal government's subsidy of the wind industry seems to be highly effective. The primary incentive the federal government uses for wind energy is the renewable energy production tax credit (PTC). The PTC is designed to offset the high capital costs associated with the construction of new renewable energy facilities (including wind), by providing a 1.5 cent (adjusted for inflation, this is now 1.9 cent) per kilowatt-hour

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[203] GAO, FEDERAL ELECTRICITY SUBSIDIES: INFORMATION ON RESEARCH FUNDING, TAX EXPENDITURES, AND OTHER ACTIVITIES THAT SUPPORT ELECTRICITY PRODUCTION 2–4 (2007), *available at* http://www.gao.gov/new.items/d08102.pdf.

[204] *Id.* After dollar amounts are adjusted for inflation to 2007 dollars, fossil fuels accounted for $13.7 billion in tax expenditures; renewable energy tax expenditures were $2.8 billion. Additionally, $3.1 billion was spent on fossil fuel research and $1.4 billion on renewable energy research.

benefit for the first ten years of operation.[205] This credit is an important incentive for the development of wind power: development of wind power follows a pattern of expansion in years when the credit is available and contraction in years when Congress delays extending the credit so that there is a gap of time when it is not available.[206] Because the federal government only commits to this tax credit for short periods of time, the credit may not be as successful as it could be if put in place for longer duration. In October 2008, Congress extended the credit, but, again, only for a single year.[207] In the economic stimulus bill earlier this year, Congress extended the wind PTC for another three years, through 2012.[208] Although the federal government has not done as much as it could to address climate change, its small efforts in the wind industry have been effective, and could easily be made more effective.

But this isn't the whole picture. Contrary to predictions that the federal government would do a better job of taking climate change into account in regulation than the state, the federal government so far has done less to address GHG emissions than many states. Although renewable portfolio standards seem to have a strong correlation with wind development in states, proposals to adopt a national standard have foundered. Additionally, the federal government has shown reluctance to correct for the negative externalities created by GHG emissions. The United States has not ratified the Kyoto Protocol, the international treaty calling for the reduction of GHG emissions by developing nations, and has only asked industries to voluntarily restrict their GHG emissions. In fact, it was in response to perceived federal inaction in the context of climate change that the state regional compacts, such as the Regional Greenhouse Gas Initiative, were created.[209]

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[205] *See* 26 U.S.C. § 45; Union of Concerned Scientists, Production Tax Credit for Renewable Energy, http://www.ucsusa.org/clean_energy/clean_energy_policies/production-tax-credit-for-renewable-energy.html (last visited Apr. 7, 2009).

[206] *Id.*

[207] American Wind Energy Association, Legislative Affairs, http://www.awea.org/legislative/ (last visited Apr. 7, 2008).

[208] Department of Energy, *Economic Stimulus Act Extends Renewable Energy Tax Credits*, EERE NEWS, Feb. 18, 2009, http://apps1.eere.energy.gov/news/news_detail.cfm/news_id=12247.

[209] Environmental Law Institute, Endangered Environmental Laws, Recent Cases, http://www.endangeredlaws.org/case_RGGI.htm (last visited Apr. 7,

So, although the federal government is theoretically more likely to take the full effect of wind power on climate change into account, its slower reaction to the climate change crisis compared to many states belies this theory, undermining the rationale to grant it control over wind power siting. However, this may change in the near future with the election of Barack Obama, and a Democratic majority in both houses of Congress. The change in administration may also mean a change in the willingness and ability of the federal government to address climate change. President Obama ran on a platform that included proposals for a nation-wide cap-and-trade program and Renewable Portfolio Standard,[210] and will be replacing an administration with significant ties to the oil industry.[211] If the new administration is able to get meaningful climate change legislation enacted, this might justify increased federal involvement in turbine siting.

b. *Public Choice in Protecting Wildlife*

There are many similarities between the state and federal treatment of wildlife concerns. Like the federal government, many states have adopted voluntary guidelines for reducing wildlife impacts of wind turbines, and although both states and the federal government have general laws protecting wildlife, none have sought to prosecute wind power developers under these laws for the birds they have killed.[212]

Although there are numerous documented takings of birds by wind power companies, the FWS has brought no criminal charges, preferring instead to work with the company on prevention of future harm, rather than punishment for past harms.[213] States, likewise, have failed to prosecute wind companies under their own wildlife protection laws, but have instead worked with companies to mitigate the effects of their actions. When wind power damaged native prairie grasses in Minnesota, the company was required to purchase other habitat in compensation. In California, the state has worked to reduce bird kills at Altamont Pass by having power

2009).

[210] OBAMA FOR AMERICA, *supra* note 1.

[211] Joseph Kahn, *Bush Advisers On Energy Report Ties To Industry*, N.Y. TIMES, June 3, 2001, § 1, at 30, *available at* http://www.nytimes.com/2001/06/03/politics/03DISC.html.

[212] GAO, PROTECTING WILDLIFE, *supra* note 11, at 33.

[213] *Id.* at 36.

companies replace older turbines with newer ones and to turn off specific turbines at specified times.[214]

Although these mitigation efforts have had a positive effect on avian mortality, some are afraid that the failure to prosecute is an indication of the government's unwillingness to enforce wildlife protections.[215] However, since both levels of government have failed to prosecute under their respective laws, this tells us very little about which level of government takes proper account of the harms to wildlife in its analysis. It is possible that the governments are making the tradeoff between the need for renewable energy and the number of bird kills and deciding in favor of renewable energy. But since the policy is not open, it is difficult to say. (The Justice Department has a policy against discussing its reasoning behind declining to prosecute specific cases.)[216]

4. *The Race to the Bottom*

Wind energy is relatively new, which means that most states are still deciding how to regulate it in the first place. If the race to the bottom exists, however, there may be a concern that states will look at Texas (which has outpaced every other state in attracting wind industry development and has no siting guidelines) and loosen existing wildlife protections (or never develop them) in an effort to attract additional wind development to their states. However, this is unlikely. It is not clear that the development of wind power in Texas is driven only by the lax wildlife regulations, rather than other factors such as abundant wind and transmission capacity.[217] The variations in state's environmental laws are more likely to reflect variations in environmental protection preferences than a race to the bottom.[218] States' regulatory cultures vary widely and it is unlikely that a state such as California, which has often enacted more stringent environmental regulations than other

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[214] *Id.* at 42.

[215] *See Gone with the Wind: Impacts of Wind Turbines on Birds and Bats: Oversight Hearing by the Subcomm. on Fisheries, Wildlife, and Oceans, H. Comm. on Natural Resources*, 110th Cong. (2007) (statement of Eric. R. Glitzenstein, Meyer, Glitzenstein & Crystal) *available at* http://resources committee.house.gov/images/Documents/20070501b/testimony_glitzenstein.pdf.

[216] GAO, PROTECTING WILDLIFE, *supra* note 11, at 37.

[217] *See supra* Part I.B.2.e.

[218] *See* Adler, *supra* note 161, at 151–54.

states, would be swayed by Texas's example.[219]

B. *Conclusions*

The above analysis indicates there is reason to worry that local governments will let parochial preferences outweigh social welfare when making wind turbine siting decisions, so there is justification to remove siting decisions from local governments. Decisions should be made primarily at the state level, with local input and federal oversight only in a few areas.

There is strong justification for federal involvement in wind turbine siting when it comes to considering the effects of the turbines on migratory wildlife. Since much of the wildlife harmed by wind farms is migratory, the benefits of protecting it are external to local or state governments, so they may not fully value them in their decisions. Many states lack the expertise to evaluate wildlife impacts from wind turbines on their own and are already turning to the federal government for guidance. Others, although encouraging wind development, have not yet done anything to formally address the negative impact wind turbines can have on wildlife. Moreover, given the successful growth of the wind industry in Texas, where there are no specific wildlife protections, other states may be tempted to loosen their own protections to attract industry to their jurisdiction, creating a race to the bottom.

The rationale for the federal government taking any further control of siting is less warranted. Much of the information that should be considered when making siting decisions is site-specific, and thus most easily and cheaply gathered at the local or state level. Also, since electricity markets are regional, rather than national, state or regional regulation will best internalize the externalities of air pollution and of electricity demand and supply not being located together. However, global climate change is a huge externality and some states do not seem to be acting to mitigate it fast enough. Although it might be best to approach this problem comprehensively—through a carbon tax or carbon cap that would affect all sources of GHG emissions, rather than just electricity generation—that may not be politically feasible. So, something more targeted at wind power may be warranted. If (or when) the nation decides that the risks of climate change are so great that they supersede local interests, then this could be a reason

[219] *See* Revesz, supra note 167, at 585–93.

to preempt state and local governments from unreasonably rejecting wind development proposals.

Below are two different proposals for increased federal involvement in wind turbine siting. The first scenario deals only with providing increased protections for the national interest in wildlife. The second uses the provisions of the Telecommunications Act of 1996 concerning cell tower siting as a model for federal control of wind turbine siting. Both scenarios are hybrid schemes, giving both the federal and state government input into siting decisions. Given the factors examined in this paper, this may be the best way to protect interests at both the national and local levels, and utilize both local and national expertise and information. Most importantly, the hybrid scheme prevents the federal government from having to create and administer a bureaucracy dedicated to administering windmill siting permits. This would prevent a lag in turbine siting approvals which would be associated with creating a new bureaucracy, and the expense of administering it.

1. *Increase in Federal Protection of Wildlife in Wind Turbine Siting Decisions*

A new law to protect migratory wildlife from wind turbines is needed. The current laws protecting wildlife do not protect all of the species that are externalities to state and local governments. Additionally, the MBTA and Bald and Golden Eagle Protection Act do not have any formal way for companies to avoid prosecution by complying with FWS guidance (as is provided by applying for incidental take permits under the ESA). Furthermore, the FWS does not have the resources to monitor compliance at every wind development site on its own. Since the MBTA does not have a citizen suit provision, there is no way for the public to bring violators to the attention of the FWS to be prosecuted.[220]

Instead, Congress should enact a new law against unreasonable incidental takes of wildlife (not just endangered

[220] Adding a citizen suit provision to the MBTA would not be advisable because it might open the judicial floodgates. The MBTA is a strict liability statute, which means that any take of a bird protected by the statute is a criminal violation under the act. Right now prosecutorial discretion on the part of the Justice Department prevents too many frivolous suits from being brought against anyone who kills any protected bird in any way, even by accident. But this filtering mechanism would not exist under a citizen-suit regime.

species, but something that would encompass harm to non-endangered migratory birds as well as bats) through the construction and operation of industrial wind turbines. As a part of this law, there would be a presumption of reasonability for following the FWS wildlife guidelines, and a built-in provision for citizen suits. That way, the FWS wouldn't have to seek out wind developments and make sure they're following the rules, but would trust that concerned members of the public would bring the worst offenders to their attention. Companies would know that so long as they are following the guidelines, they will probably not be found guilty, but they will still have the option to abandon the guidelines when it would be reasonable to do so. This would provide minimum standards for the protection of wildlife at wind farm sites, especially in states like Texas, which are not regulating wind turbine siting at all. It would also allow the states that value wildlife more highly than the national government to strengthen protection of wildlife that the FWS guidelines don't protect.

2. *Greater Federal Control Of Wind Turbine Siting Decisions*

If the national government decides that the costs of global climate change outweigh the costs of removing state control from making wind turbine siting decisions, state and local government control of turbine siting decisions should be reduced.

A federal-local hybrid regulatory scheme would not be an entirely unique entity. In the mid-nineties, in response to a perceived "not in my backyard" sentiment among zoning boards (which Congress feared would cause the diffuse national interest in a comprehensive wireless network to be thwarted by powerful local zoning board members who abhorred the visual effect of cell towers on their neighborhoods), Congress passed the Telecommunications Act of 1996.[221] The concern underlying the provisions of the Telecommunications Act dealing with cell tower siting is similar to the concern in the wind turbine siting context: that the national benefit is an externality that can be unreasonably overwhelmed by local aesthetic concerns at the zoning board level.

Section 704(a)(7) of the act preserves local zoning authority over the placement of wireless communications towers, except when such actions prohibit or effectively prohibit the "provision of wireless services." However, local governments can refuse to

[221] *See* City of Rancho Palos Verdes v. Abrams, 544 U.S. 113, 115 (2005).

issue a permit for tower siting when doing so would not leave a "significant gap" in the provider's coverage. This gives localities flexibility in denying siting permits for cell towers when they would be duplicative or otherwise unnecessary. The act also prevents local governments from regulating "on the basis of environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions."[222] The law also creates a cause of action for any person injured by a state or local government's action or failure to act consistently with the act.

The analogous Wind Power Siting Act would have similar provisions, but would be based on a national renewable portfolio standard, rather than on the provision of wind power, because the externality which justifies federal involvement in siting is global climate change (the solutions to which are broader than wind turbines).[223] A state or local government would be prevented from taking actions that prohibit or which would in effect prohibit the utility meeting its percentage of power from renewable energy sources. This would preserve flexibility for the state to seek out more socially efficient means of meeting the national goal, if available.

The law would also prohibit local governments from regulating on the basis of harm to wildlife if the development has followed federal guidelines and laws (such as the ESA). This restriction would be similar to the one preventing regulation on the basis of the effects of radio frequency emissions in the Telecommunications Act of 1996 by providing a nationally agreed upon standard of protection, but no more.[224] This would protect national values in wildlife and encourage developers to take the effects on migratory birds into account when planning their developments, or risk being harshly regulated by local governments. State and local governments would, however, not be able to use protection of wildlife as a pretext for NIMBY

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[222] Telecommunications Act of 1996 § 704(a)(7), 47 U.S.C. § 332(c)(7).

[223] Similarly, the goal of the Telecommunications Act was not to build communications towers, but to insure the provision of wireless service.

[224] Telecommunications Act of 1996 § 704 ("No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions.")

campaigns.

However, when states have a genuine interest in protecting local wildlife that is not protected under national laws, this interest will be undervalued under this regime. Additionally, in states like Texas that do not regulate the siting of towers, it may add little protection because there is no threat of additional state regulation or oversight. Thus, it would still be a good idea to pass the law described in the previous section in conjunction with this scheme.

A similar approach to that used above for wildlife could be used for any standard federal legislators were afraid could be misused for NIMBY purposes. This would not be a perfect solution: if the law were constructed with a blanket list of reasons for which local governments cannot prohibit wind power, it not is likely to be exhaustive. This may open the law to abuse by crafty local governments with NIMBY tendencies.

The law might also be vulnerable to the same abuse as that of the Wisconsin law prohibiting local governments from restricting the installation of "wind energy systems" except in the case that the restriction protects public health or safety.[225] But, if local governments were to build up unreasonable sets of regulations which had the effect of preventing wind development (as has seemed to happen in Wisconsin), developers could sue them alleging that they had effectively prevented the provision of wind power, as cellular service providers have sued localities which pass laws effectively prohibiting the provision of wireless services.[226]

This would give developers an opportunity to fight parochial restrictions in federal courts if the renewable portfolio standard could not be met. This should help to overcome the NIMBY problem.

This hybrid program is a coarse approach toward wind turbine siting, but it would be appropriate if the national government decides that the costs of climate change if wind turbine development is hindered far outweigh the costs to local communities from getting siting decisions wrong. It would allow the federal government to encourage states that are behind in developing their wind resources, to overcome local barriers and

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[225] WIS. STAT. ANN § 66.0401. *See* Vickerman, *supra* note 199.

[226] *See e.g.* Omnipoint Communications, Inc. v. Village of Tarrytown, 302 F.Supp.2d 205 (S.D.N.Y. 2004) (holding that village zoning board's denial of variance of set-back provisions of zoning code needed for construction of a communications tower was not supported by substantial evidence).

increase development, but also protect national interests in migratory wildlife.

CONCLUSION

Wind turbine siting decisions should be made at the state level, with federal contributions to the process only if they truly improve the process. The federal government could improve the current situation by forcing the consideration of the effects to the nation of harm to wildlife by wind turbines, especially in Texas where development is steaming ahead with no public process for evaluating the effects of wind development on wildlife.