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Wind Energy Development: Can Wind Power Overcome Substantial Hurdles to Reach the Grid?

Steve Goodman

Wind Energy Development: Can Wind Power Overcome Substantial Hurdles to Reach the Grid?

*Veery Maxwell**

Abstract

And energy has the potential to completely change the way the world receives electricity. The technology is both clean and green. Generating electricity from wind energy will enable utilities to purchase less power from conventional fossil fuel based sources. After construction, wind projects produce no carbon emissions. However, the wind energy industry faces significant barriers to market entry in the Unites States, including local community opposition, environmental opposition, permitting difficulties, and ever-changing incentive structures. These factors have created a

* Veery Maxwell, a third year law student at UC Hastings, is interested in cleantech solutions to climate change. She would like to thank Professor Takacs and the *West-Northwest* team for their support.

relatively unfriendly atmosphere for wind energy development in the United States. In order for wind energy to become viable, the federal government must make efforts to reduce these hurdles by changing the regulatory framework for the wind energy industry.

I. Introduction

Wind energy has all the potential in the world. The technology is both clean and green. Generating electricity from wind not only produces zero carbon emissions after the construction phase, but also will reduce demand on other emission-intensive conventional power sources. Additionally, wind farms do not use water as a coolant, and thus can be sited in water-scarce areas. The inputs to wind energy, after the initial assembly phase, are essentially wind and managerial labor. The only output is electricity; there is no waste, emissions, or chemical byproducts post-construction.[1]

In addition to producing electricity, wind farms also provide jobs and revenue to surrounding areas. Wind projects generate temporary construction jobs, as well as long-term maintenance jobs.[2] Additionally, efforts to shift away from fossil fuels will reduce American dependence on foreign oil and keep money out of the hands of undemocratic foreign regimes. Combined, all of these benefits can help the United States achieve emissions reduction goals, improve air quality, and benefit national security.[3]

Industry skeptics point to the inherent weaknesses of wind energy. First, wind is intermittent by nature, like solar power, and unlike fossil fuels. Land-based wind power will not provide consistent electricity output, at least not until there is a method for storing electricity once it is produced. The cost of wind-driven electricity has fallen 90 percent over the last twenty years, and now can be as inexpensive as 5 cents per kilowatt-hour, depending on the size and location of the wind farm.[4] However, this price fluctuates based on weather conditions, transmission factors, and economies of scale.[5] Wind turbines face occasional steep local opposition as allegedly unsightly blights on rural landscapes.

Oddly enough, environmentalists have also opposed wind farms because the turbines can cause bird and bat mortality, and disrupt valuable

1. U.S. Dep't. of Energy, 20 *percent* W*ind* E*nergy by* 2030: I*ncreasing* W*ind* E*nergy's* C*ontribution to* U.S. E*lectricity* S*upply* 105 (2008), *available at* https://www1.eere.energy.gov/windandhydro/pdfs/41869.pdf.

2. U.S. Dep't. of Energy, W*ind* E*nergy for* R*ural* E*conomic* D*evelopment* 3 (2004), *available at* http://www.nrel.gov/docs/fy04osti/33590.pdf.

3. 20 *percent* W*ind* E*nergy by* 2030, supra note 1, at 18, 105.

4. I*d*. at 27.

5. I*d*. at 27-28

habitat.[6] Both concerns have led to delayed or canceled projects and lawsuits.[7] The government itself impedes the development process by having an expensive and lengthy permitting process, as well as requiring Environmental Impact Statements.[8] The Department of Defense ("DOD") and the Federal Aviation Administration ("FAA") have halted wind projects due to worries that wind turbines affect the government's out-dated radar systems.[9]

These conflicting viewpoints on developing wind power have resulted in federal inaction, leaving states and private investors to muddle their way through the minefield of opposition in developing wind power sources. The current regulatory situation requires a long and costly process to bring a wind farm onto the electricity grid. This note will touch on many of the sources of conflict for wind energy development in the United States before analyzing other countries' successful policies.

Many other countries have moved rapidly to embrace wind energy. Countries in the European Union adopted many renewable energy technologies as the region attempts to meet its emissions targets as codified in the Kyoto Protocol.[10] The European Union passed a critical wind power implementation law in 2001, eclipsing other wind energy policies.[11] China and India also moved to acquire wind energy technology and begin manufacturing their own turbines.[12] The rise in wind power on a global scale provides the United States with the opportunity to learn from other nations. In the past ten years, Spain emerged as a renewable energy powerhouse, with massive growth in the sector.[13] In 2008, 11.5 percent of Spain's

6. Robert D. Kahn, *Siting Struggles: The Unique Challenge of Permitting Renewable Energy Power Plants*, Electricity J., 21-26 (March 2000) *available at* http://www.rdkco.com/upload/science2rdk.pdf.

7. *Id.* at 28-29.

8. *Id.* at 23-25.

9. Press Release, Pillsbury Law, *Air Traffic Vs. Wind Turbines: Can Wind Power And Aviation Coexist?* (May 26, 2010), http://www.pillsburylaw.com/index.cfm?pageid=19&itemid=5514.

10. BTM Consult ApS, *World Market Update* 2004 (*Forecast* 2005-2009) 2 (2005) *available at* http://www.btm.dk/news/world+market+update+2004+forecast+2005-2009/?s=9&p=1&n=16&p_id=2.

11. *R&D Funding for Renewable Energies in the Balance*, Euractiv.com (June 29, 2007), http://www.euractiv.com/en/energy/clean-energies-receive-eu-researchfunding-boost/article-156159.

12. Keith Bradsher, *Indian Turbine Maker Becomes World Class as Rising Economies Discover New Source of Wealth*, N.Y. Times (Sept. 28, 2006), http://query.nytimes.com/gst/fullpage.html?res=9507E4DC1630F93BA1575AC0A9609C8B63.

13. Asociación Empresarial Eólica (Spanish Wind Energy Ass'n), *Covering of the Demand in* 2008, http://web.archive.org/web/20100918202619/aeeolica.es/en/observatorio_generacion.php

electricity came from wind power.[14] Additionally, China is now a huge player in the wind energy field, both in terms of large-scale production and implementation. Both nations use aggressive policies to support wind energy, from which the United States could glean valuable lessons to help propel American wind energy forward.

Ultimately, the success of the industry will require comprehensive regulatory action to remove some of the barriers to development. The current situation, with a plethora of opposition and very little consistent governmental support, does not benefit the wind developers, the public, or the environment. An effort must be made to streamline the permitting process, address the environmental questions raised by wind turbines, and keep the local public supportive in order to make wind energy a viable large-scale energy source.

II. The Current Regulatory Environment

State governments have been relatively supportive of wind energy. The support has come largely in the form of renewable portfolio standards ("RPS"), which require utility companies to generate a certain percentage of their energy from renewable sources by a certain date.[15] Currently thirty-two states have some sort of RPS, with an additional five states pursuing non-binding goals.[16] The targets and timelines of the various RPS are inconsistent, however, and in many cases lack penalties for failure to meet goals.[17]

Though RPS have not been universally adopted and lack uniformity, they have spurred wind energy investment.[18] In order to meet the requirements imposed by the RPS, utilities have looked to wind as their primary source of renewable energy.[19] Roughly 93 percent of non-hydro renewable energy capacity that has come into use in RPS states from 1998 through 2007 is from wind power according to a Lawrence Berkeley National Laboratory report on RPS.[20]

14. *Id.*

15. Database of State Incentives for Renewables and Efficiency, *available at* http://www.dsireusa.org.

16. Center for Climate and Energy Solutions, *Renewable and Alternative Energy Portfolio Standards* (November 2011), *available at* http://www.c2es.org/what_s_being_done/in_the_states/rps.cfm.

17. *See generally* Database of State Incentives for Renewables and Efficiency, available at: http://www.dsireusa.org.

18. Ryan Wiser & Galen Barbose, Lawrence Berkeley Nat'l Lab., *Renewables Portfolio Standards in the United States: A Status Report with Data Through* 2007,13 (2008) *available at* eetd.lbl.gov/ea/ems/reports/lbnl-154e.pdf.

19. *Id.*

20. *Id.*

The public firmly supports the established state-implemented RPS, and there is bipartisan support for a federal level RPS.[21] In a 2009 study, the American Wind Energy Association found a majority of Democrats and Republicans support a federal RPS, in general, and 75 percent support RPS that required 25 percent electricity from renewables by 2025.[22] In early 2010, Senator Lindsey Graham (R-SC) worked with Senators John Kerry (D-MA) and Joe Lieberman (I-CT) on climate change legislation that would have laid a framework for a federal cap on utility emissions, which would function as a RPS.[23]

Given the substantial benefits and general goodwill associated with wind energy, in conjunction with the growing desire to limit greenhouse gas emissions, it is surprising that federal and state politicians have not rushed to embrace the technology. Government incentives have been limited by several factors. First, the federal government has yet to pass comprehensive legislation relating to energy and carbon emission reductions. Many prospective bills have contained language both directly and indirectly benefitting wind energy. A federal RPS would force utilities to seek out renewable options, and many would first turn to wind [24] The failed Waxman-Markey Energy Bill of 2009 included a RPS that mandated 20 percent renewable energy usage by 2020.[25] A federal RPS has been proposed multiple times in separate bills, but has never made it through Congress.[26]

Both the federal government and many states have implemented financial incentives for renewable energy development and implementation.[27] These incentives have largely taken the form of subsidies and support for technology research and development.[28] This funding,

21. Press Release, Am. Wind Energy Ass'n, *New Poll Shows Nationwide, Bipartisan Support for Renewable Electricity Standard* (May 5, 2009), *available at* http://archive.awea.org/newsroom/releases/New_Poll_Shows_Support_for_RES_050509.html.

22. *Id.*

23. Joe Romm, Climate Progress, *Graham, Kerry, Lieberman share details of bipartisan climate and clean energy jobs bill with industry groups* (March 17, 2010), http://climateprogress.org/2010/03/17/graham-kerry-lieberman-share-details-of-bipartisan-climate-and-clean-energy-jobs-bill-with-industry-groups/.

24. Donald S. McCauley et al., *Renewable Portfolio Standards, Capturing the Power of Electric Restructuring* 175, 181-82 (Joey L. Miranda ed., Am. Bar. Ass'n 2009).

25. H.R. 2454, 111th Cong. (2009) (*American Clean Energy and Security Act of* 2009) *available at* http://www.govtrack.us/congress/billtext.xpd?bill=h111-2454.

26. Donald S. McCauley et al., *Renewable Portfolio Standards, Capturing the Power of Electric Restructuring* 175, 181-82 (Joey L. Miranda ed., Am. Bar. Ass'n 2009).

27. U.S. Energy Info. Admin., *Federal Financial Interventions and Subsidies in Energy Markets* 2007 (*Exec. Summary*), XV, *available at* www.eia.doe.gov/oiaf/servicerpt/subsidy2/pdf/execsum.pdf. [*Hereinafter* Subsidies in Energy Markets 2007.]

28. Jeffrey Logan & Stan Mark Kaplan, Cong. Research Serv. Report for Congress, *Wind Power in the U.S.: Technology, Economic, and Policy Issues* 2 (June 20, 2008),

however, has only been intermittently available, which makes it very difficult for private companies to depend on the money for long term planning.[29]

Energy subsidies have been offered for decades, but have largely benefited the conventional fuel industry.[30] In 2007, conventional fuel electricity production[31] received 48 percent of total subsidies given to the electricity sector.[32] Renewables received fewer than 15 percent of the total sector subsidies.[33] The lack of consensus regarding energy solutions at every governmental level has reduced incentives for investments in new technologies and the costly infrastructure required to support them. So long as the federal government only provides consistent symbolic verbal support for wind energy producers, the industry will continue to suffer growing pains.

III. Areas of Conflict

A. NIMBY

A critical barrier to entry for wind energy development is local hostility. While the American public is very supportive of wind energy in theory, not many people want large turbines in their neighborhood.[34] This social phenomenon is commonly referred to as NIMBY-ism ("Not In My BackYard"), and is a growing problem for wind energy developers. Citizens have attempted to block wind farms, complaining the turbines are a visual blight, are too noisy, and create odd flutter shadows.[35] These complaints have resulted in lawsuits, and at times halted, delayed, or dramatically limited proposed projects.[36]

The fundamental grievance with wind farms in the United States is siting. The turbines are large, the site construction is invasive, and the projects are often built in relatively rural areas. The turbines look very

available at http://www.fas.org/sgp/crs/misc/RL34546.pdf; U.S. Dep't. of Energy, *Federal Incentives for Wind Power Deployment* 1-2 (Oct. 2009), *available at* http://www1.eere.energy.gov/windandhydro/pdfs/federal_incentives_wind_deployment.pdf

29. U.S. Gov't. Accountability Office, *Renewable Energy: Wind Power's Contribution to Electric Power Generation and Impact on Farms and Rural Communities*, GAO-04-756, 32 fig. 8 (Sept. 3, 2004), available at www.gao.gov/new.items/d04756.pdf.

30. Subsidies in Energy Markets 2007, supra *note* 27, *at page xv*.

31. Coal, refined coal, natural gas, and petroleum.

32. Subsidies in Energy Markets 2007, supra *note* 27, *at xv*.

33. *Id*.

34. *See* Tom Zeller Jr., *Noisy Wind Turbines Attract Complaints*, N.Y. Times (Oct. 5, 2010), http://www.nytimes.com/2010/10/06/business/energy-environment/06noise.html?_r=1.

35. *Id*.

36. *See Town of Barnstable v. Cape Wind Assocs.*, LLC, 27 Mass L. Rptr. 111 (Mass. Super. Ct. 2010).

industrial, and therefore present a jarring contrast to the pleasant agricultural landscape they regularly occupy.

According to Robert Kahn, a siting expert, "Americans put a high value on wilderness and open space. Sparks fly when lands seen as public viewscapes (even if they are not publicly owned) appear threatened. Unfortunately, these lands are where developable renewable resources are to be found."[37] Renewable resources like wind and solar power tend to be easiest to capture in large open areas, which can overlap with scenic areas and parklands. In order to lessen local opposition, wind developers have attempted to mitigate the negative impacts of their projects. Some companies have even gone so far as to hire artists to try and make the turbines look 'artsy' instead of industrial.[38]

B. Federal Agency Opposition

Aside from local resident opposition, wind energy developers face complaints from the DOD and the FAA.[39] Both agencies use outdated radar technology.[40] Wind turbines can cause radar interference and can appear as airborne objects on radar screens.[41] Radar functionality problems raised at the last minute have resulted in expensive delays and haphazard mitigation efforts by developers.[42] Both the DOD and the FAA have been working to implement better radar technology and develop guidelines for best mitigation practices for wind farms.[43] The current economic downturn, however, makes replacing out-dated radar technology a low priority, and unlikely to happen in the near future.

C. Environmental Opposition

Environmental groups have also been opposed to wind development, particularly in sites inhabited by threatened or endangered species. It seems paradoxical that environmentalists actively oppose emission-free energy production. This incongruous conflict is driven by the fact that wind

37. *Siting Struggles*, *supra* note 6, at 23.

38. *See* Adrian Pearson, *Artist Working on Turning Wind Turbines into Works of Art*, JournalLive.co.uk (Dec. 16, 2008), http://www.journallive.co.uk/north-eastnews/todays-news/2008/12/16/artist-working-on-turning-wind-turbine-into-works-of-art-61634-22483669/.

39. See Leora Vestel, *Wind Turbines Projects Run Into Resistance*, N.Y Times, (Aug. 26, 2010), available at: http://www.nytimes.com/2010/08/27/business/energy-environment/27radar.html.

40. *Id.*

41. *Id.*

42. Lisa Daniel, *Officials Work to Resolve Wind Energy, Radar Dilemma*, Am. Forces Press Serv., (July 2, 2010), http://www.defense.gov/news/newsarticle.aspx?id=59879.

43. *Id.*

turbines have been known to cause species mortality, and are often sited in rural areas that offer needed species habitat.[44] This has caused environmental groups to pursue lawsuits under the Endangered Species Act, Migratory Bird Act, and other environmental protection statutes, in hopes of seeking an injunction against the wind farm construction and operations.[45]

The Coastal Habitat Alliance sued a Texas wind developer in 2007, demanding an injunction to halt construction on a wind project adjoining the Laguna Madre, an environmentally sensitive bay between the Texas mainland and Padre Island.[46] The Coastal Habitat Alliance alleged that the defendant developer impinged its rights under the federal Coastal Zone Management Act of 1972 and the Texas Coastal Management Program by not holding public hearings or conducting appropriate environmental review on the wind farm.[47] A federal court dismissed the case, holding the statutes did not confer a right of action on private parties.[48] However, the case drew attention to the emerging issue of wind turbine siting in ecologically fragile areas.

In West Virginia, environmental plaintiffs were successful in halting operations of a wind farm sited in an area home to endangered Indiana bats.[49] After exhaustive presentations by expert witnesses, the federal court found, "there is a virtual certainty that Indiana bats will be harmed, wounded, or killed imminently by the Beech Ridge Project, in violation of section 9 of the ESA . . .."[50] The court held that until the developer undergoes the Incidental Take Permitting process through the Fish and Wildlife Service, no new turbines could be approved by the agencies or constructed for the project.[51]

The *Beech Ridge* case was the first wind farm conflict decided under the Endangered Species Act, and demonstrates the need for federal agencies to actively oversee the development of wind farms.[52] In order to avoid costly litigation at every turn, the *Beech Ridge* holding shows that the myriad of federal agencies involved in approving wind farms must develop comprehensive standardized siting and permitting criteria. While the Fish

44. *Id.*

45. *See Animal Welfare Inst. v. Beech Ridge Energy* LLC, 675 F. Supp. 2d 540 (D. Md. 2009).

46. *Coastal Habitat Alliance v. Patterson*, 601 F. Supp. 2d 868, 870 (W.D. Tex. 2008).

47. *Id.* at 874-875.

48. *Id.* at 880-882.

49. *Animal Welfare Inst.*, 675 F. Supp. 2d at 580.

50. *Id.* at 579.

51. *Id.* at 579-80.

52. Maria Glod, *Court halts West Virginia wind farm to guard endangered bat*, Wash. Post (Dec. 10, 2009), available at: http://www.washingtonpost.com/wpdyn/content/article/2009/12/09/AR2009120904106.html.

and Wildlife Service has been spearheading a collaborative effort to develop wind farm guidelines, only draft voluntary siting guidelines have been published.[53]

The two most noteworthy examples of environmental groups opposing wind farms, differ dramatically in terms of location, technology, rationale of opposition, and timing. However, in both cases the wind developer has continued to press forward with development and operations. The first case involves the Altamont Pass, located just east of the San Francisco Bay Area, which was a massive experiment in wind energy begun in the 1970s.[54] The second case involves the Cape Wind project, which is more modest in size, but located in a high-visibility area of Nantucket Sound.[55] The projects are instructive as to the broad range of claims opponents have levied against wind farms. Both cases have directly and indirectly driven a host of solutions to the environmental and local problems generated by wind farms.

D. Altamont Pass: Environmental Opposition as a Result of Species Mortality

Altamont Pass is the root cause of the engrained perception that a conflict exists between environmentalists and wind energy proponents. Due to the unquestionably high level of avian mortality recorded at Altamont, the wind industry has worked for decades to undo the stigma associated with large-scale wind energy production.[56] Altamont Pass was an early test in wind energy production, turbine technology, and siting. The consortium project, once publicly lauded and financed with state money, erected 5,000 first-generation turbines in the 1970s without the rigorous environmental analysis now performed at proposed sites.[57]

Altamont Pass became the rallying cry for environmental groups opposed to wind farms. While the area is known for its strong winds, it also lies directly on a migratory bird route and within critical raptor hunting habitat.[58] As a result of this confluence of factors, the high avian death toll

53. See U.S. Fish and Wildlife Serv., *Wind Energy Development Information*, available at: http://www.fws.gov/windenergy/index.html.

54. *Fact Sheet on Altamont Pass Bird Kills*, Ctr. for Biological Diversity, http://www.biologicaldiversity.org/campaigns/protecting_birds_of_prey_at_altamont_pass/pdfs/factsheet.pdf.

55. Kevin Grandia, *History of the Cape Cod Offshore Wind Energy Project*, EnergyBoom (April 28, 2010), http://www.energyboom.com/wind/history-cape-cod-offshore-wind-energy-project.

56. *See Fact Sheet on Altamont Pass Bird Kills*, *supra* note 54.

57. Will Wade, *The Unexpected Downside of Wind Power*, Wired (Oct. 5, 2005), http://www.wired.com/science/planetearth/news/2005/10/69177?currentPage=all.

58. *Id.*

at Altamont Pass is now viewed as an "anomaly."[59] However, bird kills continue to be viewed as a major impediment to wind farm development.[60] A 2002 report prepared for the Bonneville Power Association found that wind projects in California and elsewhere were delayed or halted due to intense scrutiny and environmental review resulting from "avian collision concerns" following Altamont.[61]

Environmental groups have been fighting to disable the wind turbines at Altamont for decades. Both the State and the wind developers (a consortium led by FPL Group) have spent substantial financial resources and time studying animal mortality at Altamont Pass.[62] Mitigation efforts have been implemented and the studies at Altamont have informed siting and mitigation decisions at many other wind farms.[63] However, environmental groups continue to pursue a permanent shutdown of the 5,000 turbines, not solely a temporary injunction.[64]

In *Center for Biological Diversity, Inc. v.* FPL *Group, Inc.*, the court found that individuals and environmental groups have standing to sue under California's public trust doctrine.[65] The environmental plaintiffs alleged the 5,000 turbines had killed over 25,000 raptors since their installation, including over 1,000 golden eagles, a species of concern.[66] In a notably bold procedural holding, the court concluded California's public trust doctrine requires the state "to preserve and protect the public's interest in common natural resources," including wildlife.[67] This decision furthered California's history of interpreting the public trust doctrine extremely expansively.[68]

The environmental plaintiffs earned important victories: they had standing to sue under the public trust doctrine, and the public trust doctrine was broadly applied to encompass wildlife impacted by large-scale energy

59. *Id.*

60. *Id.*

61. Wallace Erickson, Synthesis and Comparison of Baseline Avian and Bat Use, Raptor Nesting *and* Mortality Information from Proposed and Existing Wind Developments (*Dec.* 1, 2002) (hereinafter "Comparison of Baseline") (*prepared for the Bonneville Power Association*, available at www.bpa.gov/power/pgc/wind/avian_and_bat_study_12-2002.pdf.

62. *See e.g.*, K.S. Smallwood & C.G. Thelander, *Bird Mortality at the Altamont Pass Wind Resource Area*, Nat'l Renewable Energy Lab. (Aug. 2005), *available at* www.nrel.gov/docs/fy05osti/36973.pdf.

63. Comparison of Baseline, supra *note* 61.

64. See *Ctr. for Biological Diversity, Inc. v.* FPL *Group, Inc.*, 83 Cal. Rptr. 3d 588, 600-02 (Cal. Ct. App. 2008.).

65. *Id.*

66. *Id.* at 592.

67. *Id.* at 597-599 (*quotation omitted*).

68. *See* David Takacs, *The Public Trust Doctrine, Environmental Human Rights, and the Future of Private Property*, 16 N.Y.U. Envtl. L.J. 711, 748-752 (2008).

projects. However, the court found that such claims must be made against the governmental agencies charged with protecting the public trust, such as the county that authorized the wind farm, and not against the operators of the wind farm.[69] The statute of limitations on filing a writ of mandamus against either the county or the permitting agency had long expired, so the environmental plaintiffs did not come away with a concrete victory at Altamont.[70] That being said, the FPL court provided California plaintiffs with a roadmap for how to successfully fight a wind development in the future.

The future of the Altamont Pass wind farm now essentially lies in the hands of Alameda County and the California Energy Commission ("CEC"). The county stepped in to take a more active oversight role of the project once the controversy over avian mortality arose. Since 1998, Alameda County has enforced a 583-megawatt cap on wind energy generation in order to conduct the appropriate environmental impact review of the region.[71] This resulted in indefinitely halting any new wind energy projects in the county.[72] The CEC has funded extensive environmental analyses of the wind farm[73] and the resulting reports have provided a wealth of possible solutions for Altamont Pass itself, and preventative measures that should be analyzed prior to the development of any wind farm.

The proposed solutions from the Altamont Pass studies include: altering habitat around the base of the turbines to make the area less attractive to raptors, shutting down the turbines during the highest mortality months, clustering the turbines, and purchasing conservation easements to offset the impacts of the turbines.[74] Properly sited conservation easements could help mitigate the loss of habitat filled with dangerous wind turbines, but should be further studied to determine actual feasibility and species benefit. These recommendations are the product of experience and scientific analysis, and should be widely adopted.

While many wind developers have voluntarily agreed to take certain steps to mitigate avian impacts, there is no reason why permitting agencies (local, state, and federal) should not have standardized guidelines for certain aspects of proposed wind farms. Many agencies have developed, or

69. *Ctr. for Biological Diversity*, 83 Cal. Rptr. 3d at 605.

70. *Id.*

71. Tel. Interview with Sandra Rivera, Alameda Cnty. Planning Comm'n (Feb. 24, 2011).

72. *Id.*

73. See K.S. Smallwood & Lee Neher, *Map-Based Repowering of the Altamont Pass Wind Resource Area Based on Burrowing Owl Burrows, Raptor Flights, and Collisions with Wind Turbines*, Cal. Energy Comm'n, (Aug. 2009), *available at* http://www.energy.ca.gov/2009publications/CEC-500-2009-065/CEC-500-2009-065.pdf.

74. *Bird Mortality at the Altamont Pass Wind Resource Area*, *supra* note 62.

are in the process of developing, recommendations for wind projects.[75] However, most of these voluntary guidelines pertain to project siting, not to turbine layout and design. There will always be variation based on the particular location of the wind farm, but the developer should bear the burden of proving that the critical factors for species and habitat in the area were analyzed, and the appropriate modifications to lessen any adverse impacts were made. Every wind farm should be required to establish baseline species counts, migration patterns, behavioral patterns, and seasonal fluctuations. Disparity as a result of differing geography and species is unavoidable, however, some aspects of wind developments, such as spacing, painting, and perching prevention could be more stringently regulated with mandatory guidelines.

Altamont Pass has provided decades of scientific data demonstrating the impacts of a poorly sited wind farm, with first generation turbines, on species populations. It is impossible to undo past damage, but it is crucial that permitting entities and wind energy developers learn lessons from Altamont. While the California Environmental Quality Act ("CEQA") imposes certain environmental review requirements, the law was not specifically designed to regulate wind developments.[76] The most reasonable way to impose industry best practices is to codify such practices into regulatory requirements. Compliance with requirements will, at a minimum, reduce suits based on alleged lack of review, as well as prevent avian mortality.

Alameda County has worked extensively with the Altamont Pass developers to implement the solutions suggested above,[77] but it is undoubtedly easier and more cost efficient to mandate such actions prior to the construction. Voluntary wind energy guidelines currently exist at both the state and federal level,[78] but a comprehensive regulatory scheme beyond the mandates of CEQA and National Environmental Protection Act ("NEPA") would provide a more effective framework for developing wind projects from

75. *See California Guidelines for Reducing Impacts to Birds and Bats for Wind Energy Development*, Cal. Energy Comm'n (Sept. 27, 2007), *available at* http://www.energy.ca.gov/2007publications/CEC-700-2007-008/CEC-700-2007-008-CMF.pdf; Wind Energy, *Proposed Forest Service Directives*, 72 Fed. Reg. 54233, 54233 (Sept. 24, 2007).

76. The same can be said of CEQA's federal counterpart, the National Environmental Protection Act ("NEPA").

77. Telephone Interview with Sandra Rivera, *supra* note 71.

78. See *Wind Power Siting, Incentives, And Wildlife Guidelines In The United States* 13, U.S. Fish and Wildlife Ser. (Oct. 2007), *available at* http://www.fws.gov/habitatconservation/windpower/AFWA%20Wind%20Power%20Final%20Report.pdf; *see also* Frederic J. Frommer, *Federal agency proposes voluntary guidelines for wind power developers to avoid bird deaths*, L.A. Times (Feb. 8, 2011), http://latimesblogs. latimes.com/unleashed/2011/02/federal-agency-proposes-voluntary-guidelines-for-wind-power-developers-to-avoid-bird-deaths.html.

start to finish.

E. Cape Wind: NIMBY Combined with Environmental Concerns

The current newsworthy wind project litigation has been raging for ten years, and will likely continue for years to come. The battle over the proposed Cape Wind farm in Nantucket Sound started as soon as the project was proposed in 2001.[79] A new crop of environmental and general nonprofit groups filed suit in June 2010, after the multitude of lawsuits brought by individuals and communities attempting to halt the project before it was granted regulatory approval failed.[80] Most of the previous claims focused on NIMBY concerns such as aesthetics and noise, and had many vociferous high profile supporters.[81]

The new round of litigation is the result of the Department of the Interior issuing final approval for the 130-turbine project. The plaintiffs, in four distinct lawsuits, are arguing the wind farm will exact a "terrible toll" on federally protected birds and whales.[82] The plaintiffs claim the government and the developer failed to adequately assess the environmental impacts of the wind farm, in violation of multiple federal laws including NEPA, the Endangered Species Act, and the Migratory Bird Treaty Act.[83] Cape Wind Associates, the project developer, filed a motion to dismiss for lack of ripeness; the plaintiffs responded by consolidating into a single suit and filing a brief opposing the motion to dismiss.[84] This round of suits has continued the pattern of persistent litigation surrounding the project, and will significantly delay and increase the costs of the Cape Wind project.

One of the intriguing aspects of the Cape Wind litigation is that environmental groups are battling each other. Cape Wind Associates counts Massachusetts Audubon and Oceana among its supporters.[85] This conflict highlights the intense emotional attachment felt by local residents, compared to the more detached viewpoint of global nonprofits supporting

79. *History of the Cape Cod Offshore Wind Energy Project*, *supra* note 55.

80. See *Barnstable*, 27 Mass. L. Rptr. 111.

81. See Robert F. Kennedy, Jr., *An Ill Wind Off Cape Cod*, N.Y. Times, (Dec. 16, 2005) http://www.nytimes.com/2005/12/16/opinion/16kennedy.html.

82. Beth Daley, *6 Groups file first suit to halt wind farm*, Boston Globe (June 26, 2010) http://www.boston.com/news/local/massachusetts/articles/2010/06/26/6_groups_file_first_suit_to_halt_wind_farm/.

83. See *Alliance to Protect Nantucket Sound v. Salazar et al.*, Opp'n to Mot. to Dismiss, D.D.C., Civ. No. 10-1067, 6-10 (Nov. 12, 2010).

84. *Id.* at 1.

85. *See 6 Groups file suit*, supra note 82; *see also* Press Release, *Mass Audubon Supports Cape Wind Energy Project* (June 25, 2010), http://www.massaudubon.org/news/index.php?id=1482&type=press.

the project. The lead plaintiff in the lawsuits against Cape Wind is the Alliance to Protect Nantucket Sound ("Alliance"), which is supported by area residents, towns, and fishing and business organizations, all alleging economic and environmental concerns.[86]

The plaintiffs are making environmental claims predicated on the idea that the turbines will cause bird mortality and disrupt whale habitat.[87] This case is distinguishable from the conflict at Altamont Pass, where there was ample evidence of species mortality and the lack of environmental review prior to project construction.[88] There was no question that the Altamont Pass first-generation wind turbines were causing significant damage to bird populations, and these species losses could have been mitigated by adequately assessing the project impacts before construction.[89] In Nantucket, Cape Wind, the federal government, and environmental nonprofits have performed long-term analyses of the proposed project, and have found no evidence of statistically significant mortality or habitat disruption.[90]

The plaintiffs have not conducted any of their own scientific analysis; they are alleging that as a result of the defendant developer's involvement in the environmental review process, the findings are inherently biased.[91] Tensions are running high as a result of the constant push and pull between the involved parties. According to Jack Clarke of Massachusetts Audubon:

> I didn't bump into any of these organizations on Nantucket Sound when [our organization conducted extensive surveys]. Our data shows it will not pose a threat to endangered or migratory bird populations. This is not the time for any legitimate environmental group, in the face of the most damaging environmental catastrophe in the nation in the gulf, to say a renewable energy project is a threat.[92]

The Alliance has responded to such criticisms by stating that environmental concerns are only one of many defense tactics the group

86. *See About Us*, Alliance to Protect Nantucket Sound, http://saveoursound.org/content_item/aboutus.

87. *Id.*

88. K. Smallwood & Carl G. Thelander, *Bird Mortality in the Altamont Pass Wind Resource Area, California* (2008), *available at* http://www.altamontsrc.org/alt_doc/r51_smallwood_thelander_bird_mortality_in_altamont_pass_2008.pdf.

89. *Id.*

90. See *Massachusetts Audubon Avian Research Results*, Mass Audubon, http://www.massaudubon.org/wind/avian_research.php; *see also Six Groups File First Suit to Halt Wind Farm*, supra note 82.

91. *Alliance to Protect Nantucket Sound*, supra note 83, at 16.

92. *Six Groups File First Suit to Halt Wind Farm*, supra note 82.

intends to pursue through litigation.[93] This response, which alludes to the fact that the plaintiffs intend to argue every possible legal claim, does not lend credence to the strength of their environmental claims in the current lawsuit.

The Department of the Interior and the FAA both issued findings of no significant impact for the project, but in October 2011 the U.S. District Court of Appeals for the District of Columbia found the FAA did not adequately determine the dangers posed by the turbines, and thus vacated and remanded the determinations back to the FAA.[94] While the court decision will certainly result in additional delays for the project while the FAA conducts a more extensive project analysis, only two months later Cape Wind scored a significant legal victory in Massachusetts. The Massachusetts Supreme Judicial Court reviewed and upheld the Massachusetts Department of Public Utilities decision to approve the Power Purchase Agreement between Cape Wind and National Grid.[95] This unrelenting series of loses and victories enables the project developers to keep pushing forward towards construction, but sets a terrible precedent in terms of the time and costs associated with an offshore wind farm.

Though the plaintiffs have only alleged very general environmental claims in the Cape Wind suits, they have also proposed a solution: move the project further away from shore, out of eyesight.[96] Cape Wind has responded by claiming that the technology is not yet feasible for deep-water wind farms.[97] However, this is not exactly true, since the technology is rapidly turning into a practicable option.[98]

European companies, like Statoil Hydro, have begun experimenting with wind turbines mounted on deep water oil platforms, and start up companies like SWAY are patenting floating turbine technology.[99] European companies are not the only ones trying to develop technology to avoid the NIMBY and environmental issues raised by onshore (and shallow offshore)

93. *Id.* ("This suit is on impacts to birds [and other species] but we clearly have other objections.") (*quotation omitted*).

94. *Massachusetts: Wind Farm Delayed* , N.Y. Times (Oct. 28, 2011), *available at* http://www.nytimes.com/2011/10/29/us/massachusetts-wind-farm-delayed.html?_r=1&ref=windpower.

95. *In Boost for Clean Energy and Mass., Court Upholds Wind Contract with National Grid*, Cape Wind (Dec. 2011), http://www.capewind.org/news1231.htm.

96. See *Deep Water Wind Sites*, The Alliance to Protect Nantucket Sound, *available at* http://www.saveoursound.org/content_item/alternatives-deepwater.html.

97. Corinne Steinbrenner, *Winds of Change* (Feb. 18, 2010), *available at* http://www.bu.edu/sustainability/winds-of-change/.

98. See Martin LaMonica, *After Cape Wind, Deep Challenges for Offshore Wind*, CNET News (April 1, 2010), http://news.cnet.com/8301-11128_3-20001369-54.html.

99. Peter Fairley, *Wind Power Moves into Deep Waters*, Tech. Rev. (June 4, 2008), *available at* http://www.technologyreview.com/energy/20854/?a=f.

wind projects. In fact, in October 2010, Google and Good Energies announced a proposal to build a wind energy transmission backbone 22 miles off the east coast of the United States.[100] In May 2011, the Federal Energy Regulatory Commission approved an above-market 12.59 percent return on equity to incentivize the development of the project.[101] This cutting edge technology concept would place the United States at the forefront of offshore wind energy development.

The rapid growth of interest and investment in deep water wind turbines comes as a direct result of the problems arising from attempting to address the local and environmental concerns surrounding land and shallow water wind projects.[102] Both Cape Wind and Altamont have provided the wind energy industry with critical lessons learned. The combination of reduced local and environmental opposition and strong offshore winds provides powerful incentives for companies to further develop the technology. Such companies are willing to gamble that the high costs associated with deep-water turbines will drop, and that conventional power will get more expensive once carbon emissions are regulated.

While the current lawsuit alleging inadequate environmental review of the Cape Wind project is unlikely to succeed, given the lack of scientific evidence offered by the plaintiffs and substantial legal victories already secured by the developers, the Alliance to Protect Nantucket Sound may still succeed in preventing the project. Based on the rapid rate of technology development in deep-sea turbines, it may ultimately prove more cost effective for Cape Wind to abandon the Nantucket Sound project and move further offshore.[103] Certainly other wind developers may decide to postpone any contentious planned projects on the prospect of improved deep-water technology. When comparing the combined costs of litigation and mitigation against the cost of deep-water turbines, the latter may end up providing the more cost-effective solution. Given the current host of opposition to onshore and near shore wind power development, the best option for the future may very well be deep-water turbines. Certainly the management at Google and Good Energies believe this to be the case. A corollary benefit to developing deep-water turbines is that the technology may provide the perfect solution to the problem of old oil platforms. There

100. Matthew Wald, *Offshore Wind Power Line Wins Backing*, N.Y. Times (Oct. 12, 2010), *available at* http://www.nytimes.com/2010/10/12/science/earth/12wind.html?pagewanted=1.

101. Peter Behr, *Offshore Wind Transmission 'Backbone' Clears One Hurdle, Faces Several More* N.Y. TIMES (May 20, 2011), http://www.nytimes.com/cwire/2011/05/20/20climatewire-offshore-wind-transmission-backbone-clears-on-2793.html?pagewanted=1.

102. *See* Martin LaMonica, *supra* note 98.

103. *Blowing at Sea*, THE ECONOMIST (May 7, 2008), http://www.economist.com/node/11323401?story_id=11323401.

would be a certain ironic justice in repurposing defunct oilrigs as bases for deep-water wind turbines.

IV. International Adoption of Wind Power

A. Spain

Countries within the European Union ("EU") began investigating and implementing clean energy options decades ago as a result of the emissions targets set by the Kyoto Protocol. The EU's energy mandate calls for production of 300 gigawatts ("GW") of wind energy by 2030.[104] The EU's 2001 energy legislation laid out a framework for renewable penetration targets, to be determined by individual member states, based on Kyoto emission targets.[105] Most countries have implemented a mix of coal, nuclear, and renewable technologies with varied success rates. The Spanish government's policies relating to onshore wind power demonstrate how aggressive implementation can work well to promote the adoption new technology.

Spain has made impressive moves away from traditional coal-based electricity in the last several decades. Between 2001 and 2010 Spain's installed wind power capacity increased by 17.75GW.[106] In 2007, only 24 percent of Spain's electricity was produced from coal, with the rest being produced largely by natural gas, nuclear, and renewables.[107] By comparison, in the United States, in 2007 48.5 percent of electricity was produced from coal.[108] On several occasions in 2008, wind power provided for over 40 percent of the hourly electricity demand in Spain, and for several days wind provided over 30 percent of the total daily demand.[109] Wind power

104. European Wind Energy Ass'n, EWEA *Aims for 22 percent of Europe's Electricity by* 2030, Wind Directions, 25 (Nov.-Dec. 2006), *available at* http://ewec2006.info/fileadmin/ewea_documents/documents/publications/WD/2006_november/WD26-focus.pdf.

105. *Directive* 2001/77/EC *of the European Parliament and the Council of* 27 *September* 2001, Office Journal of the European Comms., L283/33 (Oct. 10, 2007), *available at* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32001L0077:EN:NOT.

106. *Global Wind Power Development Lessons For China*, Deblock Consulting.,(Aug. 2011), http://deblockconsulting.com/blog/china-news/global-wind-power-development-lessons-for-china/.

107. *Renewable Policy Review: Spain*, 2009 3, European Renewable Energy Comm., *available at* http://www.erec.org/fileadmin/erec_docs/Projcet_Documents/RES2020/SPAIN_RES__Policy_review__09_Final.pdf (hereinafter "EREC *Spain*"),

108. U.S. Energy Info. Admin., *Electric Power Monthly: Data for November* 2011, http://205.254.135.7/electricity/monthly/index.cfm.

109. IEA *Wind Energy: Annual Report* 2008, Int'l Energy Agency, 239 (July 2009), *available at* http://www.ieawind.org/AnnualReports_PDF/2008/2008%20AR_small.pdf ((hereinafter "IEA *Wind Energy*").

represented 11 percent of total electricity production in 2008, with Spain having the second highest installed wind capacity in Europe and third highest in the world at that time.[110] More than 16,740 GW of wind were online in 2008, generating 27,050 terawatts of electricity, with Spain planning to double this capacity by 2020.[111]

The key reason for Spain's successful adoption of wind energy, and a strong policy recommendation for the United States, comes from the feed-in tariff ("FIT") system Spain utilizes. Spain's FIT contains three key common components that are drivers for the wind industry.[112] First, it provides wind energy providers with a guaranteed buyer for their power through pre-existing contracts.[113] Second, the FIT mandates a fixed premium price paid to wind energy producers.[114] Finally, the FIT also contains a long-term power purchase agreement, stabilizing the regulatory environment for years to come.[115] In fact, Spain's FIT has been so successful in encouraging industry growth that the government decided to reduce the price premiums by 35 percent from 2010 to 2013 to limit the overall cost of the program.[116]

Spain has been forced to experiment with the level of support mandated by the FIT in order to avoid over- and under-compensating wind producers.[117] The country has implemented a two premium-price FIT design in an attempt to address these challenges by more closely targeting compensation based on renewable energy project costs.[118] Spain introduced a variable premium-price FIT design with both a price cap and a price floor as part of its Royal Decree 661/2007.[119] On an hourly basis, the decree ensures that the FIT premium payment declines as electricity prices increase, and vice versa.[120] This strategy provides more stable revenues for

110. *Id.*

111. *Id.* at 239-41.

112. Karlynn Cory et al., *Feed-in Tariff Policy: Design, Implementation, and* RPS *Policy Interactions*, Nat'l Renewable Energy Lab., 2 (2009), *available at* www.nrel.gov/docs/fy09osti/45549.pdf (hereinafter "Feed-in Tariff Policy").

113. *Id.*

114. *Id.*

115. *Id.* at 2, 10.

116. *Spain Agrees on Cutting Tariffs for Wind, Solar*, Platts (July 5, 2010), http://www.platts.com/RSSFeedDetailedNews/RSSFeed/HeadlineNews/ElectricPower/8871787.

117. *Feed-in Tariff Policy*, *supra* note 112, at 4-5.

118. *Id.*

119. Anne Held et al., *Feed-in Systems in Germany, Spain and Slovenia: A Comparison*, Fraunhofer Inst. Systems and Innovations Research 12-18 (2010), *available at* http://feed-in-cooperation.org/wDefault_7/download-files/research/IFIC_Comparison-FITS-systems-in-DE-ES-SL_2010_final.pdf.

120. Arne Klein et al., *Evaluation of Different Feed-in Tariff Design Options: Best Practice Paper for the International Feed-in Cooperation* Fraunhofer Inst. Systems and

producers by introducing a compensation floor, and limits the risk exposure of consumers by reducing the FIT payment level if electricity prices increase.[121]

Through extensive research, the International Energy Agency has concluded that countries using a FIT had the highest effectiveness encouraging wind power deployment.[122] The success experienced in Germany, Portugal, and Spain in deploying onshore wind projects stems both from high investment stability guaranteed by the long term FIT and an appropriate framework with low administrative and regulatory barriers as well as relatively easy grid access.[123] Thus, Spain provides a robust policy example for the United States. Although Spain's first experiment with FIT ultimately over-compensated wind energy producers, the subsequent adjustment to the lower level two-tier FIT appears to have been successful in balancing wind energy promotion and economic feasibility.

B. China

In 1986, China entered the utility-scale wind power industry by importing and installing three 95 KW turbines manufactured by Vestas.[124] China had little manufacturing experience with respect to utility-scale wind turbines and was nearly entirely dependent on imports from Europe until recently.[125] This is in direct contrast to the small, personal turbine market, where a vibrant domestic industry previously existed in China.[126] In 1987, the "government established a special fund to provide low interest loans to promote the development of nationwide wind power projects."[127]

Under the Ninth Five Year Plan, in 1995 China's State Development and Planning Commission initiated the Ride the Wind Program to promote a

Innovations Research (2nd Ed. Oct. 2008) *available at* http://www.feed-in cooperation.org/wDefault_7/wDefault_7/download-files/research/best_practice_ paper_2nd_edition_final.pdf.

121. *Feed-in Tariff Policy*, *supra* note 112, at 5.

122. *Deploying Renewables: Principles for Effective Policies*, Int'l Energy Agency, 100 (2008), *available at* www.iea.org/textbase/nppdf/free/2008/DeployingRenewables 2008.pdf.

123. *Id.*

124. *China's Promotion of the Renewable Electric Power Equipment Industry*, Nat'l Foreign Trade Council, 48 (March 2010) *available at* http://www.nftc.org/default/ Press%20Release/2010/China%20Renewable%20Energy.pdf (hereinafter *"Promotion of Domestic Power"*).

125. *Id.*

126. *Id.*

127. *Evaluation of Policies Designed to Promote the Commercialization of Wind Power Technology in China*, Ministry of Science & Tech., State Dep't Planning Comm'n & State Econ. & Trade Commission, 49 (May 15, 2002) (*hereinafter "Commercialization of Wind Power in China"*).

model of, "demand created by the government, production by joint venture enterprise, and ordered competition in the market."[128] The program encouraged joint ventures between Chinese and foreign companies for 600 KW and 660 KW wind generators; European firms were "offered the ability to participate in wind farm development in return for technology transfers."[129]

Even after over a decade of aggressive promotion of the wind power industry by the central government, wind energy is still slightly more expensive than fossil fuel based electricity in China.[130] While the NIMBY issues experienced in the United States have not yet become a significant issue in China, given the rural nature of most wind farms, the nation faces similar problems in terms of transmission infrastructure, long-term policy guarantees, and cost of production. The Chinese government decided to address the barriers to wind power adoption in a series of comprehensive, direct policy actions in order to meet the country's ambitious renewable energy goals. The government has planned for installed wind power capacity of 50 GW by 2015 and 100 GW by 2020.[131]

One of China's solutions for lowering the cost of wind power has been to order the domestic production of equipment.[132] In 2005, the National Development and Reform Commission ("NDRC") "mandated that at least 70 percent of wind power equipment in" any project "be domestically produced."[133] This type of explicit demand has resulted in a huge boom in the domestic turbine manufacturing industry, technology innovation, and cost savings for the industry as a whole. In 2007, Chinese manufacturers captured a 56 percent market share of new wind installations.[134] While there continues to be many joint ventures with foreign wind energy companies, Chinese wind companies are experiencing substantial growth as a result of the nation's protective domestic policies. Given the contentious nature of such protectionist laws, this tactic may not be politically feasible in the Unites States. However, the federal government could continue to bolster the domestic manufacturing market with long-term financial incentives for companies producing their wind equipment within the United States.

In 2006, the Chinese government instituted essentially all possible supports for renewable energy.[135] The Renewable Energy Law enforces a compulsory grid connection, fixed 25-year FIT, technical standards for

128. *Promotion of Domestic Power*, *supra* note 124, at 49.

129. *Id.*

130. Cuiping Liao et al., *Wind Power Development and Policies in China*, Renewable Energy 35, 1882 (March 2010).

131. *Id.* at 1883.

132. *Id.* at 1884.

133. *Id.*

134. *Id.* at 1883.

135. *Id.* at 1885.

renewable energy projects, tax benefits, research and development funding, and incorporation of renewable energy education into school curriculums.[136] While China, with a communist central government, is well positioned to enact sweeping energy reforms, the country continues to struggle with enforceability.[137] Therefore, even though the Renewable Energy Law appears to be an unbelievable boon to wind energy producers, the enforcement and implementation of the law are not currently at the level needed to reap the full benefits of the policy.[138]

Ultimately, the single most important lesson the United States can learn from China is the effectiveness of a single oversight body. Both China and the United States have struggled with the maze of bureaucratic hurdles that must be navigated in order to bring a power project on grid. In 2008, China's NDRC created the autonomous National Energy Administration in an attempt to streamline and clarify the regulatory process.[139] Since then, the wind industry has grown by leaps and bounds; in 2009 alone, the country added 13,000 MW of wind capacity.[140] "In each of the past five years" China "has doubled its overall installed wind capacity."[141]

In the twelfth Five-Year plan, climate change is mentioned for the first time.[142] The plan boosts the existing targets for power sources such as nuclear, hydro and wind by 2015, which have surpassed the 2020 goals established in 2007.[143] The new five-year target for wind is 70 GW of additional power.[144] Most countries suffer from failure to meet renewable energy targets, while China is struggling to develop goals that aren't immediately overtaken by development. While the actual effectiveness of the National Energy Administration, as opposed to the ambitious policy

136. *Id.*

137. Christina Larson, *The Great Paradox of China: Green Energy and Black Skies*, Yale Environment 360 (Aug. 17, 2009), http://e360.yale.edu/feature/the_great_paradox_of_china_green_energy_and_black_skies/2180/.

138. *Id.*

139. *Id.*

140. *China - 90GW Effective Wind Capacity Anticipated by 2015*, RNCOS Indus. Research Solutions (May 19, 2010), RNCOS Industry Research Solutions, *available at* http://www.rncos.com/Blog/2010/05/China-90GW-Effective-Wind-Capacity-Anticipated-by-2015.html.

141. *Id.*

142. Deborah Seligsohn & Angel Hsu, *How Does China's 12th Five-Year Plan Address Energy and the Environment?*, World Res. Inst. (March 07, 2011), http://www.wri.org/stories/2011/03/how-does-chinas-12th-five-year-plan-address-energy-and-environment.

143. *Interpretation of second five year plan: the new energy industry changed and unchanged*, DoNews (March 21, 2011), http://www.donews.com/it/201103/398632.shtm (*translated from original Chinese*).

144. *How Does China's 12th Five-Year Plan Address Energy and the Environment?*, *supra* note 142.

instruments enacted by the central government, is still unknown, there is no doubt that China is successfully expanding its wind energy capacity. The United States should take note of the most feasible instruments used by the Chinese government and implement them domestically. Employing a single oversight body with a clear set of standards could significantly reduce the substantial complexities of getting projects approved in the United States.

V. The Future of Wind Power in the United States

In order for the wind energy industry to become economically competitive with conventional energy, several actions must be taken to reduce the considerable barriers it faces. There must be a federal effort to stabilize the regulatory environment by creating a comprehensive renewable portfolio standard, guaranteeing long term financial incentives, and creating a single regulatory oversight agency. These actions would do much to simplify the permitting process, encourage industry research and investment, as well as reduce the time and money spent trying to bring wind developments on grid.

A. Federal Renewable Portfolio Standard

The passage of a federal RPS would provide a needed long-term vision for the wind energy industry. While there was much hope early in 2010 for a bipartisan energy bill, the Deepwater Horizon oil spill and battle over healthcare legislation distracted Congress and the President from consensus building and moving forward on the energy legislation.[145] Thus, new energy legislation will need to be introduced in the 2012 term.

The most contentious aspects of a RPS are which technologies are considered "renewable," and how a federal RPS will interact with the already established state RPS.[146] Studies have shown that recent RPS proposals before Congress would provide attainable goals, renewable energy industry jobs, and cost savings.[147] Aside from potentially creating hundreds of thousands of new jobs, these studies have also estimated that a federal RPS could result in $263.4 billion of long term investment in manufacturing for renewable energy projects, and would have a negligible impact on consumer

145. Murrey Jacobson, *What Killed Obama's Energy Bill Plans*? PBS NEWSHOUR (Aug. 9, 2010), http://www.pbs.org/newshour/updates/politics/july-dec10/energy_08-09.html; *see also* Tim Dickinson, *Climate Bill*, R.I.P, Rolling Stone (July 21, 2010), http://www.rollingstone.com/politics/news/climate-bill-r-i-p-20100721.

146. *Id.*

147. *See Clean Power, Green Jobs*, Union of Concerned Scientists, (2009), *available at* http://www.ucsusa.org/assets/documents/clean_energy/Clean-Power-Green-Jobs-25-RES.pdf; *Jobs Impact of a National Renewable Electricity Standard*, Navigant Consulting, Inc., (2010), *available at* http://www.resallianceforjobs.org/public/RESAllianceNavigantJobsStudy.pdf.

electricity prices.[148]

Manufacturing and utility trade organizations have consistently opposed a federal RPS, claiming such a system would result in significantly higher electricity prices.[149] Such opposition is self-interested, motivated by a desire to maintain profit margins and avoid making a dramatic shift in production technologies. Given the current economic situation, as well as the ever-growing level of carbon dioxide in the atmosphere, the time has passed for catering to special interest requests. Congress must move forward with a federal RPS in order to provide long-term stability to the renewable energy industry, generate jobs, capital investment, and reduce greenhouse gas emissions.

B. Long-Term Financial Incentive Guarantees

Federal support for wind energy development has historically come in the form of subsidies for research and an intermittent production tax credit ("PTC").[150] Since the enactment of the PTC in 1992, the tax credits have been allowed to expire six times.[151] This inconsistency, along with the fact that most federal energy subsidies have favored conventional fossil fuel based energy, has inhibited industry growth.[152] It is difficult for companies to justify large capital investments when the future of the regulatory incentive structure is uncertain.

In 2009, the American Recovery and Reinvestment Act of 2009 ("ARRA") expanded support for wind energy by providing a 2.1 cent kWh tax credit for wind energy facilities for ten years following initial plant operation, for sites brought online before December 31, 2012.[153] Given the relatively short time window for bringing a plant online to guarantee the PTC, this action has not provided the long term stability the industry needs to secure funding and make long-term strategic decisions.

The 2009 ARRA legislation also substantially expanded federal financial support for renewable energy development in the form a 30 percent investment tax credit, or a direct grant from the Treasury Department in lieu

148. *Id.* at 3; *See Impact of a 15-Percent Renewable Portfolio Standard*, Dep't of Energy, Energy Info. Admini. (2007), *available at* www.eia.doe.gov/oiaf/servicerpt/prps/pdf/sroiaf(2007)03.pdf.

149. Press Release, U.S. *Manufacturers and Electric Companies Remain Firmly United Against Federal Renewable Portfolio Standards*, Nat'l Assoc. of Mfrs. & Edison Elec. Inst., (Aug. 3, 2007), http://www.electricenergyonline.com/?page=show_news&id=71699.

150. *Federal Incentives for Wind Power Deployment*, U.S. Dept. of Energy (Oct. 2009), *available at* http://www1.eere.energy.gov/library/asset_handler.aspx?src=http://www1.eere.energy. gov/wind/pdfs/51452.pdf&id=5075.

151. See GAO *Farm Impact Study*, supra note 29, at 32 (fig. 8).

152. Subsidies in Energy Markets 2007, supra *note* 27, *at xv* (*table* ES4).

153. 26 U.S.C § 48 (2009).

of claiming the tax credit.[154] The potential cash infusion from the grant is much needed for wind developers, since a tax credit is only beneficial to companies that have profits to tax. For a wind energy project in development, the odds of earning an early profit, and thus benefitting from the tax credit, are small. The 2009 ARRA also provides an accelerated depreciation schedule for renewable system investments, as well as $6 billion in loan guarantees for generation, transmission, and manufacturing facilities.[155] These various subsidies, while valuable efforts to support wind energy, must be guaranteed for a long time period in order to successfully encourage substantial growth in the industry.

Capital investment, land leases, and transmission linkages are all long-term projects; the time horizon for federal incentives must align in order to be truly useful to wind developers. The federal government must pass an energy bill that extends the support for renewables codified in the 2009 ARRA until at least 2021; if not longer. This consistency would allow the industry to make strategic plans, and would match the incentives guaranteed to other capital-intensive energy investments, such as nuclear energy.[156]

C. Cooperative Federalism for Regulatory Process

Currently, the wind turbine siting process lies largely in the hands of local and state governments. As a result, the regulatory process is inconsistent and often unpredictable. Given the national interest in supporting renewable energy production, the public at large and the wind energy industry specifically stand to benefit from a cooperative federalism framework for the regulatory process.

Several federal agencies, including the Bureau of Land Management, are in the process of developing and issuing guidelines for siting wind turbines on federal land.[157] Most historical wind energy development, however, has taken place on private land, thus the proposed Bureau of Land Management guidelines would not even apply. States have adopted a variety of regulatory approaches for wind developers; some states grant

154. See *Payments for Specified Energy Property in Lieu of Tax Credits under the American Recovery and Reinvestment Act of* 2009, U.S. Treasury Dep't (July 2009), *available at http://www.treasury.gov/initiatives/recovery/Documents/B%20Guidance%203-29-11%20revised%20(2)%20clean.pdf*.

155. American Recovery and Reinvestment Act of 2009 § 406, Pub. L. No. 111-5, 50 Stat. 664 (2009).

156. *See* Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (codified at 26 U.S.C. § 453) (2005).

157. *See Proposed Forest Service Directives*, 72 Fed. Reg. at 54233; *see also* U.S. Forest Service and BLM Energy Documents *available at* http://www.fs.fed.us/recreation/permits/energy.htm.

authority for siting decisions to special siting boards, while others use general utility commissions.[158] It is common for state regulatory authority over wind developments to be spread among state environmental, natural resource, parks, historical preservation, and transportation agencies. Additionally, developers must comply with state laws relating to environmental impact reports, water quality, endangered species, wetlands, and storm water runoff regulatory requirements.[159]

Instituting a cooperative federalism framework for the wind energy industry could reform the current inconsistent and convoluted regulatory process. The Telecommunications Act of 1996 ("TCA") serves as a successful role model for such a framework.[160] The TCA was enacted to support the deployment of a national telecommunications network, and includes a cell tower siting policy as a part of the overall strategy.[161] The TCA siting policy largely leaves siting decisions in local hands, but constrains certain local decisions in order to balance local concerns with the national interest in developing a communications network.[162] Prior to the passage of the TCA, local NIMBY-driven opposition to cell towers often prevented siting approval of projects, or made them prohibitively expensive.[163]

Cooperative federalism, when applied to wind regulatory processes, could increase regulatory uniformity while continuing to encourage local tailoring and experimentation.[164] According to the Department of Energy, deployment of wind projects would be greatly facilitated by increased uniformity of regulatory requirements across regions.[165] Local control of wind siting has resulted in increased application and compliance costs, and provided local opponents with the opportunity to revise local ordinances to prevent turbine construction.[166] However, this desire for increased efficiency should be balanced against the fact that experience in environmental regulation has shown the need to tailor land use policies to local circumstances.[167]

158. *State Siting and Permitting of Wind Energy Facilities*, Nat'l Wind Coordinating Comm., (April 2006), *available at* www.nationalwind.org/asset.aspx?AssetId=189.

159. *Id.*

160. Steven J. Eagle, *Wireless Telecommunications, Infrastructure Security, and the* NIMBY *Problem*, 54 CATH. U. L. REV. 445, 446 (2005).

161. *Id.*

162. *See* U.S. *Cellular Corp. v. City of Wichita Falls*, 364 F.3d 250, 253 (5th Cir. 2004) (describing the TCA's balancing of local and national interests).

163. *See* Eagle, *supra* note 160, at 455-457.

164. *See* Philip J. Weiser, *Federal Common Law, Cooperative Federalism, and the Enforcement of the Telecom Act*, 76 N.Y.U. L. REV. 1692, 1696 (2001).

165. *20 percent Wind Energy by 2030*, *supra* note 1, at 105, 119.

166. *See Siting Struggles*, *supra* note 6, at 24.

167. Weiser, *supra* note 164, at 1699.

The diversity of siting options for wind turbines has been one of the impediments to promulgating uniform federal siting guidelines, since the best practices for siting vary greatly depending on the specific location.[168] For this reason, a federal wind-siting framework should provide suggested guidelines that allow localities to experiment and surpass the base level established at the federal level. Additionally, a cooperative federalism model is preferable to a complete preemption by federal authority in terms of political feasibility. Any proposition that devolves authority from local and state officials to a federal agency is likely to be met with staunch opposition.

The framework that must be established by the federal action should be mostly fluid, but must contain a couple of key preventative measures. These requirements include prohibiting local governments from banning wind developments, siting decisions must be made within a reasonable time window, and decisions must be made in writing and supported by substantial evidence.[169] Such requirements would alleviate many of the issues raised by local control over siting. These explicit federal constraints strike the appropriate balance between local autonomy and the national interest in encouraging wind as a clean domestic energy source.

D. Implement Successful Foreign Policies Domestically

The United States must look to successful policies from other nations who have struggled with the exact same hurdles. Spain and other nations in the European Union have spent years experimenting with appropriate FIT mechanisms. While the United States offers many distinct and overlapping financial incentives, there is nothing with the same clear long-term price premium structure of the FIT used in Spain and elsewhere.

China has exponentially expanded its wind energy development in the last decade, largely through aggressive policy instruments, protecting domestic equipment manufacturers, and consolidating oversight authority under one regulatory body. The ease and desirability of having a single autonomous agency overseeing all renewable energy projects is something that both industry players and the federal government can agree upon. While the United States does not have the government structure to enact dramatic industry-changing laws rapidly, there are many lessons to be learned from China's striking entrance into the wind energy sector.

168. William W. Buzbee, *Interaction's Promise: Preemption Policy Shifts, Risk Regulation, and Experimentalism Lessons*, 57 EMORY L. J. 145, 158 (2007).

169. Patricia E. Salkin & Ashira Pelman Ostrow, *Cooperative Federalism and Wind: A New Framework for Achieving Sustainability*, 37 HOFSTRA L. REV. 1049, 1092 (2009).

VI. Conclusion

Wind energy is poised to become a mainstream source of electricity. However, the industry currently faces incredible opposition in siting its turbines. This opposition could be lessened in many different ways. The government could work to provide greater financial incentives for wind power, which would in turn allow wind developers to compensate effected neighbors more comprehensively. The issue of animal mortality has largely been solved with better environmental review of potential sites, but a national siting framework would codify environmental best practices and streamline project development by constraining some local impediments to project development.

If the industry can work to discover less contentious locations and expand current facilities for the next several years, lessening litigation and delay expenses, the cost of wind energy compared to conventional energy will continue to fall. Alternatively, new technological advances are showing that deep-water wind turbines may be a reality in the near future. This technology could negate many of the siting issues associated with turbines. There is still the possibility of ocean species mortality, but this is significantly less problematic than onshore turbines due to the wide range of siting options in the ocean. While the deep-water technology is not yet economically practicable, it only grows more cost efficient as the technology improves and oil becomes more expensive. One way or another, given the current levels of carbon in the atmosphere and improving technologies, in the next several years barriers to wind development will lessen, making wind energy a viable source of clean power for the foreseeable future.

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