

IS VERMONT READY TO EMBRACE THE WINDS OF CHANGE OR ARE THERE GALE FORCE WINDS OF CONTROVERSY STILL SURROUNDING WIND POWER?

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I. INTRODUCTION

When we think of developments in technology today, the main growth areas that come to mind are in the business, electronic, and communication sectors. Yet, technology also drives the development of alternative energy sources such as wind power. Decreasing costs over the last two decades to harvest, generate, operate, and maintain wind power technology, along with increasing concerns about reducing dependence on fossil fuels, recently prompted the United States to take a more serious look at wind power.¹ Costs to generate wind power today are estimated at three to five cents per kilowatt hour, a dramatic drop since 1982 when generation cost approximately thirty-eight cents per kilowatt hour.²

Deregulation of the electricity utility monopoly in the 1970s allowed smaller private companies to come onto the scene and build small power plants operated by alternative energy sources.³ In addition, Congress passed the Public Utility and Regulatory Policy Act of 1978 mandating that utilities allow wind turbines to connect to the grid.⁴ As depicted in Chart 1 below, today, more than 70% of electricity in the United States is produced

1. PETER ASMUS, REAPING THE WIND 2 (2001).

2. JANET L. SWAIN, MAINSTREAMING RENEWABLE ENERGY IN THE 21ST CENTURY 13 tbl.1 (2004); see also Earth Policy Institute, Average Cost Per Kilowatt-Hour of Wind-Generated Electricity, 1982–2002, with Projection to 2020 (2001), http://www.earth-policy.org/Indicators/Wind/2006_data.htm (indicating a significant drop in generating costs from thirty-eight cents to between three and five cents today and an estimated three cents by the year 2020). But see AM. WIND ENERGY ASS’N, THE ECONOMICS OF WIND ENERGY (2005), <http://www.awea.org/pubs/factsheets/Economicsofwind-Feb2005.pdf> (explaining that economics of wind energy are dependent upon proper citing and the design of the wind farm—bigger farms and turbines and more wind increases economic efficiency).

3. See ASMUS, *supra* note 1, at 2 (noting how the historical sense of the times in the 1970s and the oil crisis led to thoughts on how the United States could rely less on foreign oil).

4. Public Utility and Regulatory Policy Act of 1978, Pub. L. No 95-617, tit. I § 102, 92 Stat. 3121 (codified as 16 U.S.C. § 2612 (2000)); J.F. MANWELL ET AL., WIND ENERGY EXPLAINED 17 (2002).

by fossil fuels such as coal, oil, natural gas, and other gases.⁵ About 19% of electricity in the United States is produced by nuclear power and 6.5% by hydro-electric power,⁶ which leaves only a small fraction of power generated through renewable sources such as wind power. Thus, there is great potential to grow the wind power industry now that the economic costs for generating electricity, by utilizing this technology, are reasonable. In addition, wind power alleviates concerns about greenhouse gas emissions since there are no emissions of pollutants from this clean energy source.⁷

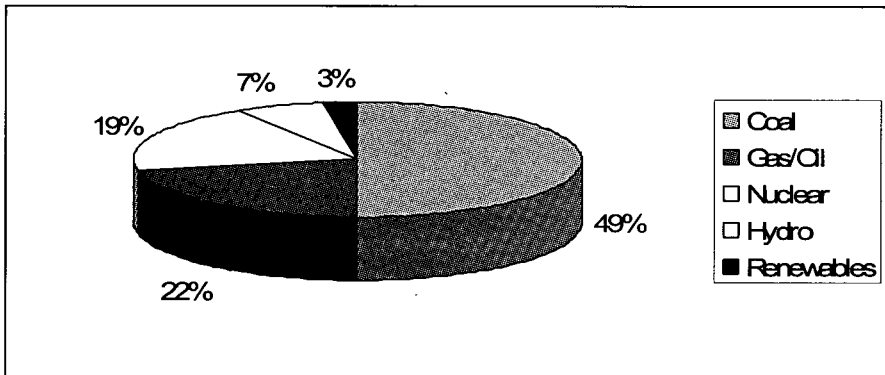


Chart 1: Sources of United States Electricity Generation⁸

5. NAT'L RESEARCH COUNCIL, ENVIRONMENTAL IMPACTS ON WIND ENERGY PROJECTS 31 fig.2-1 (2007), available at http://nap.edu/openbook.php?record_id=11935&page=31.

6. *Id.*

7. See GILBERT MASTERS, RENEWABLE AND ELECTRIC POWER SYSTEMS 378 (2004) (discussing the obvious air quality advantages of wind power); NAT'L RESEARCH COUNCIL, *supra* note 5, at 30–31 fig.2-1 (depicting percent generation of electricity and pollution emissions for the United States as a whole and highlighting the fact that hydro and renewable sources emit zero greenhouse gases).

8. NAT'L RESEARCH COUNCIL, *supra* note 5, at 31 fig.2-1.

In comparison, Vermont's electricity generation assortment contains approximately one-third nuclear power from the Vermont Yankee Nuclear Power Plant, one-third hydro-electric from Hydro-Quebec, with the remaining one-third composed primarily of market grid purchases, renewable sources (including wind power), and a small percentage generated from oil and gas.⁹

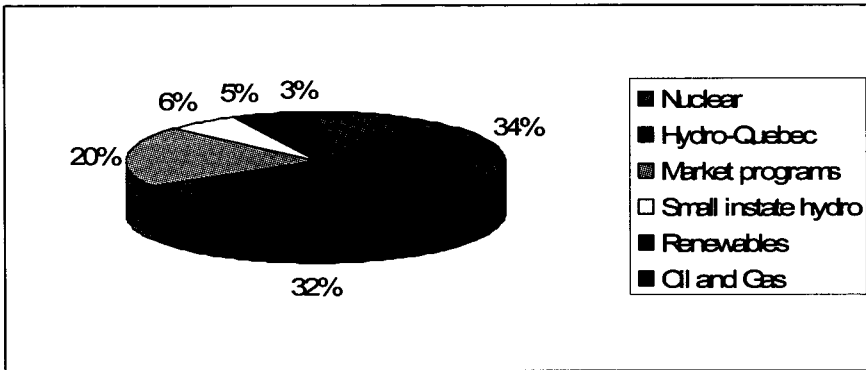


Chart 2: Vermont's Electricity Generation Sources¹⁰

A. Wind Power Beginnings in the United States

The change in the utility industry from regionally controlled monopolies to a model encouraging privatization and competition led California to implement the first commercial-scale wind farms in the United States in the 1980s.¹¹ Today, California leads the United States in installed wind power capacity at 2,537 megawatts (MW).¹² Despite the fact that California implemented the first commercial turbines, the State of Vermont boasts it is the "birthplace of U.S. wind power," since the first electricity producing turbine was constructed in West Rutland, Vermont in 1941.¹³ In addition, New Hampshire's Crotched Mountain claims the first small wind farm in the United States, built in 1980, which consisted of twenty

9. VT. PUB. SERV. DEP'T, VERMONT ELECTRICITY PLAN 2005 vii (2005), available at <http://publicservice.vermont.gov/pub/state-plans/state-plan-electric2005.pdf>.

10. *Id.*

11. MASTERS, *supra* note 7, at 111–12; NAT'L RESEARCH COUNCIL, *supra* note 5, at 57–58 fig.2-6.

12. U.S. Department of Energy, Wind and Hydropower Technologies Program, http://www.windpoweringamerica.gov/images/windmaps/installed_capacity_2008.jpg (last visited Mar. 6, 2009).

13. U.S. Department of Energy, Historic Wind Development in New England: Grandpa's Knob, http://www.windpoweringamerica.gov/ne_history_grandpa.asp (last visited Mar. 6, 2009).

turbines.¹⁴ Regardless of which state claims to be a pioneer in this field, wind power in the United States has grown in installed wind power capacity from only 1,000 MW in 1985 to 11,603 MW at the end of 2006, enough to power approximately 2.5 million homes today.¹⁵

A major boost to the wind power movement came in the early 1990s with the Energy Policy Act of 1992.¹⁶ This law allowed for even more deregulation of the electricity monopolies and a federal tax subsidy for wind power farms capable of producing electricity for the grid.¹⁷ In addition, the Energy Policy Act of 2005 streamlined the process at the federal level, allowing off shore wind power projects by channeling approval through the Department of the Interior.¹⁸

However, the United States has not been as proactive as Germany, Spain, and Denmark in encouraging development of wind power on shore.¹⁹ Germany leads the world in wind power generation with 20,621 MW of installed power, yet North Dakota, the leading U.S. state in wind power potential, has more capacity for wind power generation than all of Germany.²⁰ Although ranked fifth in the world in installed power, at 3,100 MW, Denmark provides twenty percent of its electricity from wind power to its citizens and commands the lead globally in off shore wind power generation.²¹ The United States ranks third in installed wind power generation, yet it is clearly only using a fraction of its wind power potential and capacity.²²

14. U.S. Department of Energy, *Historic Wind Power Development in New England: The Age of PURPA Spawns the "Wind Farm,"* http://www.eere.energy.gov/windandhydro/windpoweringamerica/ne_history_windfarms.asp (last visited Mar. 6, 2009).

15. U.S. Department of Energy, *Energy Efficiency and Renewable Energy, Wind and Hydropower Technologies Program,* <http://www1.eere.energy.gov/windandhydro> (last visited Mar. 6, 2009). American Wind Association, *Annual industry outlook details increased growth spurred by strong demand, investment of private capital, as well as support of federal and state programs* (Jan. 23, 2007), http://www.awea.org/newsroom/releases/Wind_Power_Capacity_012307.html.

16. ASMUS, *supra* note 1, at 137.

17. *Id.*

18. 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, 578-79 (2007).

19. JOSEPH FLORENCE, EARTH POLICY INST., *GLOBAL WIND POWER EXPANDS IN 2006* (2006), available at <http://www.earth-policy.org/Indicators/Wind/2006.htm>.

20. *Id.*; American Wind Energy Association, *Top 20 States with Wind Energy Resource Potential*, www.awea.org/newsroom/pdf/Top_20_States_with_Wind_Energy_Potential.pdf.

21. FLORENCE, *supra* note 19.

22. American Wind Energy Association, *Wind Industry Statistics*, http://www.awea.org/faq/wwt_statistics.html (last visited Mar. 6, 2009).

B. Introduction to the Wind Power Project Approval Process

United States wind power projects face the most obstacles during the permitting process at the state and local level due to a combination of zoning and permitting requirements, state land use laws, and ecology and wildlife regulations that require complex studies.²³ For example, Vermont requires each applicant to not only meet local requirements (if applicable), but then applicants must undergo a certification approval process at the state level overseen by the Vermont Public Service Board (PSB).²⁴ The PSB is an independent, three-member, quasi-judicial board charged with the “overall financial management of Vermont’s public utilities” including “review[ing] the environmental and economic impacts of energy purchases and facilities.”²⁵

Specifically pertaining to wind power development, the PSB certifies the construction of wind farms in the state by issuing them a “certificate of public good” (CPG) if they meet the requirements in section 248 of title 30 of the Vermont Statutes Annotated.²⁶ The PSB takes many factors into consideration when ruling on whether to issue a CPG, including whether environmental regulations administered by the Vermont Agency of Natural Resources (ANR) protecting species of birds and bats have been met.²⁷ In addition, the PSB takes into account other concerns—such as potential problems with aesthetics and noise—raised by citizens and other interested parties.²⁸ The PSB based its approval of wind projects in the past on evidentiary proof, which included empirical data proving proper location and placement of the turbines in relation to wildlife habitats, especially

23. See PAUL GIPE, WIND POWER: RENEWABLE ENERGY FOR HOME, FARM AND BUSINESS 272–77 (2004) (noting different institutional restrictions on wind power projects); MANWELL, *supra* note 4, at 469–76 (illustrating state and local requirements for wind power projects).

24. See VT. STAT. ANN. tit. 30, § 248 (2007) (detailing the certification approval process); see generally VT. PUB. SERV. BD., CITIZENS’ GUIDE TO THE VERMONT PUBLIC SERVICE BOARD’S SECTION 248 PROCESS, available at http://www.state.vt.us/psb/document/Citizens_Guide_to_248.pdf (providing a lay person’s guide to developing wind power in Vermont).

25. Vermont Public Service Board, Mission Statement, <http://www.state.vt.us/psb/site/mission.stm> (last visited Mar. 6, 2009).

26. tit. 30, § 248(a)(3).

27. See *id.* (stating that a permit will not be issued unless the board finds that the project will promote the good of the state); see also tit. 10, § 6086(a)(8)(A) (discussing that a permit will not be issued unless it is shown that endangered species and wildlife habitat has been properly considered); tit. 10, § 1424a(d) (noting that all three statutes impose environmental requirements). For a detailed discussion on these requirements, see *infra* Part IV.

28. See Mick Sagrillo, Aesthetics Issues and Residential Turbines (May 2004), http://www.awea.org/faq/sagrillo/ms_aesthetics_0405.html (providing examples of aesthetic issues associated with wind turbines).

those of birds and bats.²⁹ The current model seems to suggest the burden to produce this evidence is on the applicant, the wind farm developer, even though by statute the ANR is required to “provide evidence and recommendations” concerning environmental impacts to, *inter alia*, water resources and wildlife.³⁰

C. Vermont Wind Power Projects—Summary of Assertions

Part II of this note explains the general historical background of wind power in the United States and in Vermont. Part III explains, in general terms, the wind certification process for some state and local governments. Part IV.A of this note explains how the PSB adjudication procedures (adopted primarily from the Vermont Rules of Civil Procedure) may needlessly add to the timeframe for wind power permitting decisions.³¹ The proper solution is to tailor the adjudication process specifically toward renewable energy projects, making it more uniform and predictable to potential developers and possibly encouraging community ownership.³² In Part IV.B, this note confirms that section 248 of title 30 of the Vermont Statutes Annotated is the proper governing statute of PSB wind power adjudications rather than the more rigorous Act 250 standard urged by wind power opponents. The remainder of Part IV explains two recent wind project proposals as examples of the current certification process and how this process presents a potential bias against the small wind farm developer.³³ For the Sheffield Project, a large corporate applicant commissioned extensive and expensive wildlife impact studies to show that wind turbine placement was proper and met ANR standards.³⁴ Conversely,

29. tit. 30, § 248 (2007); *see also* tit. 10, § 6086(a)(8)(A) (discussing that a permit will not be issued unless it is shown that endangered species and wildlife habitat has been properly considered).

30. tit. 30, § 248 (a)(3)(E) (2000).

31. *See* VT. PUB. SER. BD. R. OF PRAC. § 2.103, *available at* http://www.state.vt.us/psb/rules/OfficialAdoptedRules/2000_Rules_of_Practice.pdf (stating that the Vermont Rules of Civil Procedure apply to PSB adjudications).

32. *See generally* tit. 30, § 248 (2007) (noting that the Vermont PSB currently utilizes the same process for all utility projects with the exception of nuclear projects for which they adhere to more strict standards).

33. *See generally* Final Order & Report, Sheffield Wind Project, Docket No. 7156 (Vt. Pub. Serv. Bd. Aug. 8, 2007) [hereinafter *Sheffield Final Report*], *available at* <http://www.state.vt.us/psb/document/7156upc/7156finalorder.pdf> (approving a large corporate wind farm project); *see also* Final Order & Report, East Haven Wind Project, Docket No. 6911 (Vt. Pub. Serv. Bd. July 17, 2006) [hereinafter *East Haven Final Report*], *available at* <http://www.state.vt.us/psb/orders/2006/files/6911fnl.pdf> (denying a small wind farm project).

34. Sheffield Final Report, *supra* note 33, at 102; *see also* *Regional Wind Development Update, Vermont*, NEW ENG. WIND F. NEWSL., Oct. 2007, at 7, *available at* http://www.windpoweringamerica.gov/pdfs/new_england/newf_newsletter_2007_10.pdf (describing the

for the East Haven project, the PSB refused to certify development at this location, repeatedly noting in its final report a lack of wildlife impact studies by this small wind farm developer.³⁵ It is difficult for smaller developers because in some instances the studies are more costly to conduct than building the wind farms, and thus applicants may become discouraged.³⁶ For this reason, among other factors, this note in Part V.A and B, explains further why the ANR is the proper body for actually conducting wildlife impact studies on birds and bats, and why the agency should not just play the role of overseer.³⁷

The remainder of Part V offers recommendations to the state on how to meet its mission of encouraging the use of clean, efficient, and renewable energy sources.³⁸ The Vermont Legislature may do this by looking to other states' policies, enacting shared-cost incentives, and implementing legislation that will help to accelerate the permitting process. Currently, private wind farm developers struggle through the process to initiate wind farm development in the state, sometimes with puzzling controversy surrounding such development.³⁹

recent approval of the UPC Wind's Sheffield project, including that UPC Wind worked with the ANR to develop stipulations for studies in order to continue the project and to minimize the risks to bird and bat populations). *But see* Carla Occaso, *Sheffield Wind Project Needs Army Corps of Engineers Review*, BURLINGTON FREE PRESS, Sept. 14, 2007, available at <http://www.wind-watch.org/news/2007/09/14/sheffield-wind-project-needs-army-corps-of-engineers-review> (noting that wind power projects also require federal government approval and in the case of Sheffield, the Army Corps of Engineers needed to review the project before issuing a federal permit).

35. East Haven Final Report, *supra* note 33, at 104–05; *see also* *Regional Wind Development Update, Vermont*, *supra* note 34, at 6 (noting that the PSB denied the permit for East Haven on August 31, 2006, due to lack of avian and bat studies as recommended by the hearing officer).

36. *See* GIPE, *supra* note 23, at 274 (noting that ecological and other studies proving that there are no hazards to the public sometimes cost more than constructing the turbines).

37. *See* VT. COUNCIL ON RURAL DEV., STRENGTHENING VERMONT'S ENERGY ECONOMY: FINAL REPORT AND RECOMMENDATIONS OF THE VERMONT RURAL ENERGY COUNCIL 22 (2007) (noting council recommendation Number 22 where the state and local communities work together to determine community wind power siting).

38. *See* VT. STAT ANN. tit. 30, § 8001 (2008) (illustrating Vermont's renewable energy goals).

39. *See, e.g.*, East Haven Final Report, *supra* note 33, at 91–92 (noting PSB order rejecting certificate of public good and essentially discouraging small developers from coming in to the state, while instead encouraging large-scale projects).

II. BACKGROUND

A. The History of Wind Power in Vermont

The Central Vermont Public Service Corporation, an electric utility company in Vermont, pioneered the field of wind power in the United States as the first electric utility monopoly in the country to purchase wind energy for auxiliary use in 1941.⁴⁰ The Smith-Putnam wind turbine was installed at Grandpa's Knob in West Rutland, Vermont, and it was the largest ever built at that time with a power rating of 1.25 MW.⁴¹ Unfortunately, in March of 1945, due to a lack of understanding about the engineering and design of turbines in the industry's infancy, one of the turbine's blades was damaged because it lacked the strength to sustain high winds.⁴² Unlike these first turbines, today's wind turbines are state of the art in design and are constructed to sustain strong winds and successfully combat elemental impediments such as ice and snow.⁴³ Regardless of any success that the Smith-Putnam wind turbine project had in Vermont, there was no incentive to rebuild the project since after World War II, the federal government turned its back on wind power and instead funded programs encouraging states to develop nuclear power.⁴⁴ Thus, it was not until the 1970s, due to the energy crisis, that the federal government looked to reduce reliance on fossil fuels by implementing alternative energy sources such as wind power.⁴⁵

B. How Wind Turbines Work and Why Wind Would Benefit Vermonters

Although normally we cannot feel the extent of its presence, wind has mass and energy, and when it comes in contact with objects it does work, creating kinetic or motion energy.⁴⁶ The amount of energy the wind

40. ASMUS, *supra* note 1, at 46.

41. See MANWELL, *supra* note 4, at 15 (indicating Grandpa's knob in Rutland, Vermont as the birthplace of wind power); For general output data on turbines, see General Electric, Wind Energy at GE, http://www.gepower.com/businesses/ge_wind_energy/en/index.htm (last visited Nov. 5, 2008) (noting that in comparison to the early turbines, GE currently constructs and supplies three of the largest turbine types in the industry that are 1.5 MW, 2.5 MW and 3.6 MW respectively).

42. MANWELL, *supra* note 4, at 15.

43. *Id.* at 18–19.

44. ASMUS, *supra* note 1, at 46.

45. *Id.*

46. GIPE, *supra* note 23, at 30.

produces is determined by its speed (rate of motion) and its mass (volume and density).⁴⁷

Winds are stronger and more consistent along the shores of bodies of water, such as oceans and large lakes, and also along the ridge lines of mountains.⁴⁸ Lakes and other bodies of water experience higher winds due to their long, unobstructed shore lines that create a path called a “fetch” where the wind passes over the water.⁴⁹ Mountain ridge lines may have double the strength of winds than the valleys⁵⁰ due to the combination of a change in terrain from valley, to ridge line, to peak, and differences in temperature moving along the jet stream, with colder air near the peak and warmer air in the valleys.⁵¹ Vermont’s Green Mountains benefit from this combination, thus, the Department of Energy recommends Vermont for commercial scale development in these locations.⁵²

C. *Environmental Concerns and Wind Farms*

Wind power does not produce carbon emissions to generate electricity, and since wind is not a finite source of energy (unlike coal for example) it is a clean and renewable source of energy. However, construction and maintenance of wind power facilities may impact wildlife negatively, specifically impacting the migration patterns and habitats of birds, bats, and raptors.⁵³

According to the Government Accountability Office’s (GAO) report on the impacts to wildlife by wind farm development, the good news is that in most parts of the country wind power farms cause very few deaths to birds, bats, and raptors, including in Vermont.⁵⁴ However, other parts of the country indicate alarming rates of avian and bat mortalities,⁵⁵ according to the experts consulted for the report including: The U.S. Fish and Wildlife

47. *Id.*

48. *Id.* at 24–25.

49. *Id.* at 24; *see also* U.S. Department of Energy, Vermont Wind Resource Map, http://www.eere.energy.gov/windandhydro/windpoweringamerica/maps_template.asp?stateab=vt (last visited Mar. 6, 2009) (noting that Lake Champlain in Vermont and New York does not appear to have enough unobstructed “fetches” in order to be classified as an excellent source of wind power, however, the map indicates some areas with fair to good ratings).

50. GIPE, *supra* note 23, at 25 fig.3.2.

51. *Id.* at 25.

52. *Id.* at 26; *see also* U.S. Department of Energy, *supra* note 49 (showing Vermont has excellent commercial wind power potential on the ridge lines, particularly in the northeast).

53. U.S. GOV’T ACCOUNTABILITY OFFICE, GAO–05–906, WIND POWER: IMPACTS ON WILDLIFE AND GOVERNMENT RESPONSIBILITIES FOR REGULATING DEVELOPMENT AND PROTECTING WILDLIFE 9 (2005).

54. *Id.* at 15, 49–50 app.II.

55. *Id.*

Service (FWS), various state agencies, scientists in industry and academia, and conservation groups.⁵⁶ According to the GAO report, there are other activities and entities that pose far more of a threat to avian populations than wind farms, including skyscrapers, communications towers, agricultural pesticide use, and attacks by predators such as domestic and wild cats.⁵⁷ Therefore, the threat to avian and bat populations due to wind farm construction and maintenance in comparison to other entities are practically non-existent in most areas of the United States.⁵⁸

Despite the fact that most regions of the country show zero or low instances of mortality among birds, bats, and raptors due to wind farms, FWS experts are concerned about two regions in the United States—the Appalachian Mountains and the Northern California Altamont Pass.⁵⁹

In Altamont Pass, studies found that over 1,000 raptors are killed each year.⁶⁰ According to the experts interviewed for the GAO report, one of the reasons contributing to the higher mortality rates in Altamont Pass is that this region produces wind energy using older turbines originally constructed in the 1980s.⁶¹ These older turbines do not produce as much energy—not as much bang for the buck—as today’s more modern turbines and accordingly it takes a larger number of the older turbines to produce the same amount of energy as produced from fewer modern turbines.⁶² In addition, the design of the older turbines are less conducive to wildlife, particularly raptors, since the blades of the older turbines are set lower to the ground than modern turbines, and the raptors become entangled when swooping down to grasp prey.⁶³

In the Appalachian Mountains, experts are primarily concerned with bat mortality rates.⁶⁴ For example, in a 2005 study, sixty-four turbines constructed in West Virginia and Pennsylvania killed over 2,000 bats during a six-week period.⁶⁵ Although bats are not an endangered species, the FWS commissioned a new study in conjunction with the United States

56. *Id.* at 2, 10.

57. *See id.* at 9–10 (highlighting that skyscrapers cause 97–976 million deaths to birds per year due to window collisions; communications towers cause 4–50 million deaths to birds per year; agricultural pesticide use causes about 72 million deaths to birds per year; and attacks by predators such as domestic and wild cats cause “hundreds of millions” of deaths to birds per year).

58. *Id.* at 15, 49–50 app.II.

59. *Id.* at 10–11.

60. *Id.*

61. *Id.* at 11, 23.

62. *Id.* at 11–13.

63. *Id.* at 12–13.

64. *Id.* at 14.

65. *Id.*

Geological Survey to further study the impacts to bats in this region and to help states assess proper siting of wind farms in this region.⁶⁶

In contrast to the issues in Northern California and the Appalachians, according to the one siting study conducted in Searsburg, Vermont in 2002, the eleven turbines standing in that region caused zero incidences of avian deaths.⁶⁷ However, the GAO conceded in its report that its studies to date are problematic in two ways.⁶⁸ First, it is difficult to make projections of future avian and bat mortalities based on current numbers since there is a lack of long-term studies; and second, the data collected at older sites are not representative of the newer turbines and facilities to be constructed after developments in design and technology that may mitigate further deaths.⁶⁹ Therefore, the GAO report concluded with more questions than answers about the future hazardous effects on wildlife by wind facilities. However, there was a consensus that the total numbers collected were not alarming in comparison to the leading causes of avian and bat deaths. Therefore, when evaluating current concerns about reducing fossil fuels and the benefits of wind farms and the clean and renewable energy they generate, the positives far outweigh the negatives.

D. Impact of Noise and Aesthetics—Technology and Custom are Combating These Issues

Modern wind turbines control noise much better today in contrast to older turbines, due in part to improvements in technology and design.⁷⁰ For example, General Electric (GE) manufactures some of the largest and most powerful turbines in the world, with technology that minimizes noise-pollution concerns through sleek blade design and buffers on the internal gears and motor.⁷¹ In addition, modern turbines, such as GE's variable speed control and advanced electronic turbines, do not require the turbines to be in constant motion, accomplishing efficiency in energy production as well as the side benefit of noise reduction.⁷² Therefore, due to

66. *Id.*

67. *Id.* at 49–50 app.II (noting that it is unknown whether or not there were bat mortalities in Vermont, because the study did not include them).

68. *Id.* at 15–16.

69. *Id.*

70. MASTERS, *supra* note 7, at 378; GE Energy, 3.6 MW Series Wind Turbine, http://www.gepower.com/prod_serv/products/wind_turbines/en/36mw/index.htm (last visited Mar. 6, 2009).

71.

GE Energy, GE's Wind Turbine Technology, http://www.gepower.com/businesses/ge_wind_energy/en/index.htm (last visited Mar. 6, 2009).

72. *Id.*

advancements in technology and design of modern turbines, it is difficult to discern between the noise from the turbine and the noise from the wind itself!⁷³

Siting decisions may also help reduce the impact of noise and aesthetics. Wind turbines at the top of a mountain ridge may be too far away to impact the sights and sound of residents living further down in the valleys. Uniformity of placement and modern sleek design make the turbines more desirable to look at when compared to other entities such as cellular telephone, television, and radio towers, which are also typically located on mountain ridges.⁷⁴

To address local concerns about aesthetics, manufacturers design turbines with nature in mind.⁷⁵ Wind turbines do not have to display bright colors. They can be painted green or brown to match the scenery and not stand out.⁷⁶ Turbines also come in a variety of shapes and sizes, and due to advances in technology, it takes fewer turbines to generate electricity for a particular community than it did in the past.⁷⁷ Thus, a community may select the proper configuration, shape, size, and color of the turbines to meet its needs.

Other advantages of wind power that a community may consider include: better air quality, aesthetic quality, and less dangers of injury than other sources of power, such as coal and nuclear plants.⁷⁸ In addition, there are many economic benefits for rural communities to take into account that boost the local economy at a lower aesthetic cost than building a big box store for example.⁷⁹ After taking the time to weigh the costs and benefits, many communities may find that these types of considerations far outweigh concerns of noise and aesthetics.

73. MASTERS, *supra* note 7, at 378.

74. *Id.*

75. Sagrillo, *supra* note 28.

76. *Id.* But see Susan Smallheer, *FAA Considers New Lighting Rules for Wind Turbines*, RUTLAND HERALD ONLINE, Oct. 5, 2005, <http://www.rutlandherald.com/apps/pbcs.dll/article?AID=/20051002/NEWS/51002002/1024> (proposing rules that wind turbines be equipped with red blinking lights in the evening in order to warn aircraft of their presence).

77. U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 53, at 11.

78. MASTERS, *supra* note 7, at 378.

79. See THE COUNCIL OF STATE GOVERNORS, RENEWABLE ENERGY AND STATE ECONOMICS: TRENDS ALERT CRITICAL INFORMATION FOR STATE DECISION MAKERS 10 (2003) ("Wind energy has similar potential for rural communities, according to the U.S. Department of Energy, which estimates that more than \$1.2 billion in new income for farmers and 80,000 new jobs could be created by producing 5 percent of the country's electricity from wind energy by 2020.")

III. THE WIND POWER CERTIFICATION PROCESS FOR NON-FEDERAL LANDS

A. State and Local Government Regulation and Permitting for Six States in the GAO Study

State and local governments control most of the wind power regulation and permitting in the United States since most of this development takes place on non-federal lands.⁸⁰ Therefore, the main challenges for wind power developers are in obtaining local zoning permits including winning over the local residents, and complying with other state land use and environmental requirements.⁸¹ The GAO report studied six states and their requirements; in three of these states developers need to only consider local codes and building ordinances,⁸² whereas in the other three states developers must adhere to both state and local regulations.⁸³ Pennsylvania requires that developers only comply with local permitting and building codes prior to approving wind power projects.⁸⁴ However, developers both during and post construction must comply with title 34 of the state's game and wildlife regulations, but it appears that these laws are not pro-active. Rather they are reactive in that if there is a violation, reactive, post construction adjudication is likely.⁸⁵ To combat criticism over their proposed projects, some developers in Pennsylvania conduct environmental and wildlife studies regularly, even though these studies are not part of the criteria for permitting.⁸⁶

80. U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 53, at 21. Another solution or recommendation outside the scope of this note is for the federal government to promote wind power development by commissioning development on its lands. For example, it already commissions use of land for ski resorts.

81. *Id.*

82. *See id.* at 22 tbl.1 (noting that California, New York, and Pennsylvania require only local building codes for permitting). Although the United States Government Accountability Office report listed California and New York as states with only local regulations, in fact, developers in California must adhere to the California Environmental Quality Act—a state regulation—in addition to local ordinances and permitting. *Id.* at 23. Likewise, developers in New York must go through a state environmental review. *Id.* at 25. Thus, Pennsylvania is the only state in this study to truly have only local regulations that developers must comply with.

83. *See id.* at 22 tbl.1. (noting that Minnesota, Oregon, and West Virginia require developers to comply with state and local regulations if applicable); *see also* VT. STAT. ANN. tit. 30, § 248 (2007) (noting that Vermont requires adherence to both state and applicable local requirements).

84. *See* U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 53, at 28–29 (discussing wind regulatory structure in Pennsylvania).

85. *Id.*; Pennsylvania Game Commission, Statutory Authority and Regulations, <http://www.dcnr.state.pa.us/info/wind/resource1.aspx> (last visited Oct. 20, 2007).

86. U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 53, at 29.

B. Vermont Wind Power Development—General Requirements

Regardless of whether wind farms are developed on federal or non-federal land, developers must comply with three federal wildlife laws, in addition to state and local laws, which generally prohibit endangering wildlife in the United States.⁸⁷ In addition, several states, including Vermont, have enacted statutes pursuant to the National Environmental Policy Act of 1969 (NEPA) in defining public utility policy, which includes the development of commercial wind farms.⁸⁸ The rules and policies of the Vermont Public Service Department (PSD)⁸⁹ and the adjudication orders issued by the PSB⁹⁰ must take into consideration both state economic and environmental factors.⁹¹

In addition to following any local zoning laws and receiving a vote by local select boards, commercial wind power applicants⁹² in Vermont must also receive a CPG issued by the PSB before any construction may begin.⁹³ To receive a CPG from the PSB, the applicant must present a detailed construction and maintenance plan to the municipal or regional planning commission pursuant to section 248 of title 30, the statute governing, among other things, commercial wind power farms connecting to Vermont's electric power grid.⁹⁴ Inclusive in this statute are the laws overseen by the ANR governing ecological and wildlife regulations.⁹⁵ These regulations

87. *Id.* at 33, 34 tbl.2; *see also* Endangered Species Act of 1973, 16 U.S.C. §§ 1531–1544 (2000) (prohibiting the taking of any listed species deemed endangered); Bald and Golden Eagle Protection Act of 1940, 16 U.S.C. §§ 668–668(d) (2000) (prohibiting the taking of any Bald or Golden eagle); Migratory Bird Treaty Act of 1918, 16 U.S.C. §§ 703–712 (2000) (prohibiting taking, killing, or possessing migratory birds).

88. *See generally* National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321–4370 (2000) (requiring environmental impact statements to assess a project's environmental consequences).

89. *See* Vermont Public Service Department, About, <http://publicservice.vermont.gov/about-dps/about-dps.html> (last visited Mar. 7, 2009) (noting that the Vermont Public Service Department governs and enforces rules and policies of public utilities as the quasi-executive agency charged with representing the public's interest in energy policy and as such is a separate agency from the PSB).

90. *See* Vermont Public Service Board, *supra* note 25 (noting that the PSB is responsible for issuing orders via adjudications and enforcing public utility regulatory policy).

91. Michael Dworkin et al., *Revisiting the Environmental Duties of Public Utility Commissions*, 7 VT. J. ENVTL. L. 1, 2 (2006).

92. For private property wind turbine installation and use, the PSB must also approve and issue a certificate of public good even if a local zoning permit is not required. *See* JEAN VISSERING, SITING A WIND TURBINE ON YOUR PROPERTY 3, available at http://www.state.vt.us/psb/application_forms/PSB_Wind.PDF (describing the process of private wind turbine construction and approval for private property owners).

93. *See* VT. STAT. ANN. tit. 30, § 248 (2007) (governing the development of public utilities in Vermont).

94. tit. 30 § 248(f).

95. tit. 30 § 248 (b)(5); tit. 10 § 6086(a)(8)(A); tit. 10 § 6086(a)(9)(K).

appear to either make or break whether applicants receive CPGs from the PSB, and consequently, whether they may move forward with construction.⁹⁶

IV. VERMONT WIND POWER PROJECT CERTIFICATION PROCESS

A. The Vermont Public Service Board Adjudication Rules and Procedures

The PSB Practice Rules 2.000 to 2.109 generally define how the PSB conducts formal adjudications.⁹⁷ According to Rule 2.103, the Vermont Rules of Civil Procedure govern the PSB adjudications with some minor changes in terminology; for example “Judge” refers to “the Board” and “trial” refers to a “hearing.”⁹⁸ If a conflict of law exists between a PSB general order and the Rules of Practice, the PSB order prevails.⁹⁹ Likewise, if there are any conflicts between the Vermont Rules of Civil Procedure and a PSB order, the PSB order prevails.¹⁰⁰

The PSB’s “Procedures Generally Applicable” (PSB Procedures) govern the PSB adjudication procedures specifically; and have some similarities to the Federal Administrative Procedure Act (APA), which governs federal agency adjudication procedures.¹⁰¹ For example, both the PSB adjudications and formal, on the record APA adjudications require a “preponderance of the evidence” standard for the burden of persuasion.¹⁰² Another example of similarities is section 2.201(E) of the PSB Procedures and § 557(d)(1) of the APA, which both prohibit *ex parte* communications that involve direct or indirect communications about the proceeding.¹⁰³ According to the PSB Procedures, the only exception to this general rule is with the notice and consent of the parties; otherwise, the agency member who engaged in *ex parte* communications risks disqualification and parties

96. This assertion is based on the decisions by the PSB in Sheffield and East Haven. See Sheffield Final Report, *supra* note 33, at 112 (accepting developer’s plan and therefore the PSB issued a CPG); East Haven Final Report, *supra* note 33, at 104–05 (denying developer’s request for CPG based on a lack of environmental studies).

97. VT. PUB. SER. BD. R. OF PRAC. §§ 2.000–2.109.

98. *Id.* § 2.103.

99. *Id.* § 2.104.

100. *Id.*

101. *Id.* §§ 2.200–2.224; Administrative Procedure Act, 5 U.S.C. §§ 551–706 (2000).

102. 5 U.S.C. § 706(E); see STEPHEN BREYER, ET AL., ADMINISTRATIVE LAW AND REGULATORY POLICY 215–17 (6th ed. 2006) (discussing the standard of proof for agency hearings).

103. 5 U.S.C. § 557(d)(1); VT. PUB. SER. BD. R. OF PRAC. § 2.201(E).

risk being “held in contempt.”¹⁰⁴ Similarly, the APA requires the agency member or party that engaged in ex parte communications “to show cause why his claim or interest in the proceeding should not be dismissed.”¹⁰⁵

Section 2.205 of the PSB Procedures defines the process for notifying other persons or parties of the adjudication.¹⁰⁶ This section is similar in scope to APA section 554, since both require notice to interested parties. The difference with the PSB Procedures pertaining to notice, is that the burden is on the party filing for the permit to identify “by name and address each person, party or other entity to whom or which the Board or the Clerk is required to give notice of such proceeding.”¹⁰⁷ In contrast, the APA section 554(c) simply states in relevant part: “[t]he agency shall give all interested parties opportunity for . . . the submission and consideration of facts”¹⁰⁸ The PSB Procedures are less ambiguous than the APA requirements in that they take notice in adjudications one step further and adopt the Vermont Rules of Civil Procedure practically verbatim, allowing motions for intervention and joinder.¹⁰⁹ In addition, the PSB Procedures also allow for the use of pre-hearing conferences¹¹⁰ and discovery,¹¹¹ whereas in a federal adjudication, discovery and pre-trial conferences are not the norm, nor are they defined in the APA.

Thus, the PSB adjudication process is more analogous to a traditional courtroom trial than to the federal formal adjudication process. This might also explain why PSB adjudications may linger on for several years. Perhaps if the PSB developed adjudication rules that would give the same opportunity for interested parties to be heard but allow for less formal pre-trial processes, wind power applicants may realize a reduced timeline for permitting.

B. Brief Note About Act 250

Vermont’s infamous Act 250 permitting process employs vigorous regulations for land use for most development projects in the state, such as for development of shopping malls and big box stores.¹¹² Wind power

104. VT. PUB. SER. BD. R. OF PRAC. § 2.201(E)(1), (3).

105. 5 U.S.C. § 557(d)(1)(D).

106. VT. PUB. SER. BD. R. OF PRAC. § 2.205.

107. *Id.*

108. 5 U.S.C. § 554(c)(1).

109. VT. PUB. SER. BD. R. OF PRAC. § 2.209–2.210.

110. *Id.* § 2.212.

111. *Id.* § 2.21.

112. Act 250, VT. STAT. ANN. tit. 10, § 6086 (2007) (providing ten criteria that developers must meet before an Act 250 permit is granted for a subdivision or development as defined by the act).

projects however, are an exception to this general rule even when it comes to land that otherwise requires an Act 250 permit.¹¹³ Section 248 of title 30 of the Vermont Statutes Annotated regulates wind power projects exclusively.¹¹⁴ Wind power opponents in the state tried to gain momentum toward the state requiring Act 250 to govern these projects instead, knowing that meeting Act 250 requirements would significantly delay most wind projects and give opponents time to make the case against them.¹¹⁵ Such opponents are out of luck, especially after the Glebe Mountain Wind Energy case in 2006 where the Vermont Environmental Court ruled that section 248, and not Act 250, governs wind projects.¹¹⁶ However, the Vermont Legislature and Governor have the final say on regulatory policy in the long run. Hopefully, lawmakers will not cave under the pressure of wind power opponents and sacrifice the benefits the citizens of Vermont may enjoy from this clean and renewable energy source.

C. General Overview of the PSB Requirements for Wind Project Certification

The PSB utilizes three main factors in its analysis when making wind power project decisions: economic factors, environmental factors, and whether or not the residents affected indicate a desire or distaste for the project, typically related to noise and aesthetics issues.¹¹⁷ Economic factors include the continued decreasing costs to generate wind power for electricity as compared to other alternatives.¹¹⁸ Since wind power has become more in line with other forms of energy (such as nuclear and hydro) in terms of actual dollar costs to generate electricity, wind power is a more

113. See *Glebe Mountain Wind Energy, LLC*, No. 234-11-05 Vtec, slip op. at 15 (Vt. Envtl. Ct. Aug. 3, 2006) (“In so ruling, we conclude that Act 250 jurisdiction under ERB 34 does not attach to electric generation facilities that are located on lands encumbered by pre-existing Act 250 permits.”).

114. *Id.* at 4; No. 04-04 Vt. Gov’t Reg. 164-2 (Weil July 2004), available at <http://governor.vermont.gov/tools/index.php?topic=ExecutiveOrders&id=797&v=Article>.

115. Jeanne Miles, *Wind Opponents Want Stricter Permitting Process*, CALEDONIA RECORD, Dec. 12, 2005, available at www.windaction.org/news/884.

116. *Glebe Mountain*, No. 234-11-05 Vtec, slip op. at 15; see tit. 10, § 6001 (Act 250 governs subdivisions and developments as defined under the act); see also East Haven Final Report, *supra* note 33, at 59 (“The statute further provides a list of criteria, primarily those found in Act 250, to which the Board must give ‘due consideration’ in examining the proposed project. In many of the Board’s Orders involving Section 248, the Act 250 criteria are listed separately with each discussed individually.”).

117. Interview with Michael Dworkin, former chairman of the Vt. Pub. Serv. Bd. (Oct. 24, 2007) [hereinafter Dworkin Interview] (notes on file with author).

118. *Id.*

realistic option than in years past.¹¹⁹ Therefore, economic factors are no longer a major obstacle to a potential wind power project, and the PSB now focuses much of the adjudication process on the environmental factors of a project.¹²⁰ In addition, residents' favor or disfavor should not be downplayed in the analysis as a whole, since citizens disfavoring wind power may come together and put political pressure on the Governor and the Legislature, affecting energy policy for the entire state.

Nonetheless, the following analysis focuses primarily on the environmental factors because the latest PSB decisions for the Sheffield and East Haven wind projects indicate this area as the sticking point. The primary environmental factors that appear to make or break a wind project are the results of wildlife impact studies, such as whether or not wildlife, especially birds and bats, are adversely affected by the proposed wind power project.

D. The Sheffield Wind Project Proposal

UPC Vermont Wind LLC (UPC Wind), now known as First Wind, petitioned the PSB for a CPG to install sixteen wind turbines with 40 MW of power in Sheffield, Vermont.¹²¹ First Wind develops projects in all of North America including the Northeast, the West, and Hawaii.¹²² According to the company's own statements, it has raised over \$230 million through its investors and major commercial banks in order to finance wind projects nationwide.¹²³ Funding wildlife impact studies over the course of several years for just one project, from pre-construction to post-construction phases, costs several hundreds of thousands of dollars,¹²⁴ and thus wind

119. See SWAIN, *supra* note 2, at 13 tbl.1 (indicating that wind costs three to five cents per kilowatt hour to generate today); see, e.g., Dworkin Interview, *supra* note 117 (indicating that since economic factors related to wind are more in line with other energy alternatives, wind power projects face their major obstacles at the environmental stage).

120. However, this is not to say that the economic factors are easily determined and are not considered. See Michael Dworkin, former chairman of the Vt. Pub. Serv. Bd., Remarks on The PSB Process: The Scope, the Players, and the Rules of Practice Before the Public Service Board 7 (Jan. 2003) (noting that the economic decisions are still very complex in that the PSB must balance whether the cost of service is appropriate and competitive for consumers at the time of the project as well as for the future); see also VT. STAT. ANN. tit. 30, § 218c(a)(1) (2007) (noting the PSB's duty in terms of the economic factors to determine a least cost integrated plan).

121. See generally Sheffield Final Report, *supra* note 33 (describing the Sheffield Wind Project).

122. First Wind, Projects, <http://www.firstwind.com/projects> (last visited Mar. 7, 2009).

123. First Wind, History, <http://www.firstwind.com/aboutFirstWind/history.cfm> (last visited Mar. 7, 2009).

124. It cost developers of a large scale development in Minnesota \$800,000 for avian studies, over the course of a four year period. These costs do not reflect ongoing costs. U.S. GOV'T

power applicants must have the capital resources to contract experts to conduct these studies.

According to the Vermont Rural Energy Council's September 2007 report, total capital investment for a large scale wind energy project consisting of twenty turbines with approximately fifty MW of electricity generation capacity involves a total investment cost of \$92.5 million.¹²⁵ These costs include development, construction, machinery, and equipment.¹²⁶ The UPC Wind/First Wind project consists of sixteen turbines producing about forty MW of electricity and therefore, it is reasonable to estimate its costs (utilizing the large scale production numbers from the Rural Energy Council report) at approximately \$74 million.¹²⁷ Therefore, if avian studies add another \$600,000–\$800,000, that consists of about a one percent increase in costs for the project as a whole.

The PSB issued a CPG for the Sheffield project noting that “UPC has commendably provided this Board with studies and commitments that allow us adequately to assess the Project’s potential impacts on birds and bats.”¹²⁸ Upon approval of the project, the PSB further stated, “UPC’s willingness to cooperate with ANR . . . demonstrate[s] that the Project complies with the relevant statutory requirements.”¹²⁹ Thus, since UPC Wind/First Wind conducted studies as well as cooperated with the ANR in

ACCOUNTABILITY OFFICE, *supra* note 53, at 25. The average amount of time it takes to conduct studies is a three year period, so costs could range from \$600,000–\$800,000 depending on how long it takes. *Id.*

125. VT. COUNCIL ON RURAL DEV., *supra* note 37, at 44–45.

126. *Id.*

127. Refer to Table 1 of this note depicting cost estimates for investment and costs associated with avian studies.

128. Sheffield Final Report, *supra* note 33, at 102; see *In re* UPC Vermont Wind, L.L.C., No. 2007-456 (Vt. 2009) (upholding the ruling of the PSB to allow First Wind to develop); see also *Court Upholds PSB’s Ruling on Wind Project*, RUTLAND HERALD, Feb. 6, 2009, <http://www.rutlandherald.com/article/20090206/THISJUSTIN/902060289> (reporting on the Vermont Supreme Court decisions that upheld the PSB’s decision to issue a CPG to First Wind despite appeals from citizens and environmental groups). First Wind provided the following statement on its website:

We are pleased that the Court has decided to affirm the VPSB’s decision to allow the permitting of the Sheffield Wind Project. First Wind will continue to move forward with the project in accordance with the Certificate of Public Good granted for the project. We believe this project has the potential to bring significant economic and environmental benefits to the State and we look forward to continuing to work with the Town of Sheffield and the surrounding region to bring clean, wind energy to the people of Vermont.

First Wind, News, <http://www.firstwind.com/aboutFirstWind/news.cfm?ID=9b9b6146-12dc-4b48-923c-90455687dc70> (last visited Mar. 7, 2009).

129. Sheffield Final Report, *supra* note 33, at 102.

agreeing to stipulations as the project moved forward, the PSB was willing to signoff on the project and issue a CPG.¹³⁰

E. The East Haven Wind Project Proposal

The East Mountain Development Company (EMDC) petitioned for a CPG to the PSB to install four wind turbines generating an estimated electricity capacity of six MW in East Haven, Vermont on a seventeen-acre-plot on a high ridgeline of East Mountain.¹³¹ Developers Matthew Rubin and David Rappaport formed the limited liability corporation in 2001 for the purpose of purchasing the seventeen-acre-property and developing wind power on East Mountain.¹³² EMDC intended to sell its electricity generation to the Village of Lyndonville Electric Department to facilitate connection to the grid.¹³³ Despite EMDC's determination to get this project off the ground, the PSB denied the company a CPG due to a lack of bird and bat mortality studies.

In reaction to the denial of a CPG, Rubin said, pertaining to small wind applicants: "[n]o developer will be able to succeed [since] there are insurmountable obstacles."¹³⁴ EMDC contends that the very nature and scale of this small project would logically result in very few deaths of birds and bats by the wind turbines.¹³⁵ EMDC's contentions are supported by federal reports such as the GAO report discussed earlier.¹³⁶ Nonetheless, the PSB denied the East Haven project a CPG, citing to EMDC's lack of studies and also its lack of willingness to stipulate to doing studies or come to some sort of agreement with the ANR.¹³⁷ EMDC believes that the PSB is sending a signal to small wind developers that discourages them from attempting to build wind farms on a small scale for the purpose of serving

130. *See id.* at 86–88, 94–95 (noting that there are several stipulations in terms of bird and bat monitoring required of UPC Wind during pre-construction, construction, and post-construction).

131. East Haven Final Report, *supra* note 33, at 8–9.

132. *Id.* at 8.

133. *See id.* at 7 (discussing the interconnection of EMDC's wind generation facility).

134. *Wind Developer Says Wind Power is dead in Vermont*, RUTLAND HERALD ONLINE, Aug. 11, 2006, <http://www.rutlandherald.com/apps/pbcs.dll/article?AID=/20060811/NEWS/608110344/1004/NEWS03>.

135. East Haven Final Report, *supra* note 33, at 92.

136. U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 53, at 10–20.

137. *See* East Haven Final Report, *supra* note 33, at 90–91 (noting that the public investment issue related to aesthetics problems associated with developing near conservation lands was another reason the Hearing Officer wanted to deny permitting, but the PSB rejected the Hearing Officer's reasoning and instead said it denied EMDC based solely on the lack of wildlife studies and in particular, studies concerning mortality rates of birds and bats).

small communities.¹³⁸ EMDC lacks the enormous financial resources of a larger entity such as First Wind and therefore finds itself at an unfair disadvantage. It is worth considering whether the state of Vermont and the PSB really want to discourage small companies that may be more reactive to the needs of the people in the community, or whether the PSB is simply applying the criteria in the statute across the board to all projects as required.

Table 1 below depicts in dollar amounts and percentages the estimated costs of avian studies in addition to other start up costs for small and large scale wind projects. As evidenced below, it is apparent that smaller projects take a greater hit in terms of increased percentage costs, assuming a constant cost for avian studies no matter the project size. Additional costs not taken into account in the table below are delays in construction due to avian studies that may take longer than expected. These opportunity costs may increase the risk and real costs for small wind applicants to develop wind projects, and therefore they may decide not to take the risk.

	Number of Turbines	MW capacity estimated	Investment cost estimated	Cost increase for 3 years of avian studies	Total costs with avian studies
Large Scale Project	20	50	\$92,500,000	0.65%	\$93,100,000
Small Scale Project	1	0.225	\$582,300	103%	\$1,182,300
Sheffield - First Wind	16	40	\$74,000,000	0.8%	\$74,600,000
East Haven - EMDC	4	6	\$15,528,000	3.9%	\$16,128,000

Table 1: Estimated Costs for large and small scale wind projects¹³⁹

138. See *id.* at 91-92 (discussing the implications of EMDC's project on other renewable energy developers).

139. See VT. COUNCIL ON RURAL DEV., *supra* note 37, at 44-47 (examining the economics of large and small wind projects in Vermont). Note that the first three columns of data are from the council's report and were used in an algebraic equation, investment cost for UPC Wind based on a cost of \$1,850,000 per MW capacity and investment costs for EMDC estimate based on cost of \$2,588,000 per MW capacity. See also U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 53, at 25 (describing the costs associated with Minnesota's required avian impact studies). Note that the data for the last two

In comparison to First Wind, EMDC was not willing to enter into stipulations to conduct studies, contending that four wind turbines cannot possibly present any significant harm.¹⁴⁰ The ANR supported the Hearing Officer's findings and recommended that the PSB deny a CPG.¹⁴¹ When EMDC refused to conduct avian studies, the ANR stepped in and contracted with DeTect, Inc., to perform about one month's worth of studies from September 28, 2004 to November 4, 2004.¹⁴² According to the Hearing Officer, the DeTect studies were insufficient and flawed in methodology and yielded "unreliable results."¹⁴³ The PSB agreed, concluding that, "[t]he Hearing Officer recommends that we find that EMDC has not presented sufficient evidence to conclude that the proposed Project would not have an undue adverse impact on birds and bats. We concur."¹⁴⁴ Section 248(a)(4)(E) of title 30 of the Vermont Statutes Annotated expressly indicates that the ANR is responsible for providing evidence pertaining to the adverse effects on bird and bat migration patterns and habitat, raising questions as to why the PSB and ANR put the onus on the applicant to conduct the studies.¹⁴⁵

The next section discusses in more detail recommendations on the proper mandate for avian impact studies for wind power projects in Vermont. This analysis includes an examination of the statutory language governing PSB wind power adjudications, policy arguments in favor of the

columns in the table above is from Minnesota's estimate of \$200,000 per year for avian studies. *See also* East Haven Final Report, *supra* note 33 at 8–9 (discussing the proposed EMDC wind project); AM. WIND ENERGY ASS'N ET AL., WIND ENERGY AND BIRD/BATS WORKSHOP (2004) (recommending that avian studies be three years in length and rigorous in nature). Column four in the table above assumes a cost of \$600,000 for the projects on an average based on the recommended three year study period and the estimated cost of \$200,000 per year of avian studies.

140. East Haven Final Report, *supra* note 33, at 94–95.

141. *Id.*

142. *Id.* at 65–66; *see also* Sheffield Final Report, *supra* note 33, at 89 (noting that one month of studies is a far cry from the two to three years of studies provided by UPC Wind's consultants for the Sheffield project where studies spanned from 2004 to 2006 and have not stopped and continue to collect data).

143. East Haven Final Report, *supra* note 33, at 104.

144. *Id.*

145.

The agency of natural resources shall appear as a party in any proceedings held under this subsection, *shall* provide evidence and recommendations concerning any findings to be made under subdivision (b)(5) of this section, and *may* provide evidence and recommendations concerning any other matters to be determined by the board in such a proceeding.

VT. STAT. ANN. tit. 30, § 248(a)(4)(E) (2007) (emphasis added); *see also* tit. 30, § 248(b)(5) ("[W]ith respect to an in-state facility, will not have an undue adverse effect on . . . the natural environment . . . with due consideration having been given to the criteria specific in 10 V.S.A. §1424a(d) and § 6086(a)(1) through (8) and (9)(K).").

ANR conducting avian impact studies rather than the applicant, and an assessment of how other states collect this type of data.

V. RECOMMENDATIONS FOR THE COLLECTION OF WILDLIFE IMPACT DATA

A. Analysis of the Proper Reading of the Statutory Language

Section 248(a)(4)(E) of title 30 of the Vermont Statutes Annotated, requires the ANR to be a party to the PSB adjudication and that it “shall provide evidence and recommendations” pertaining to the requirements in section 248(b)(5) of title 30.¹⁴⁶ Without looking at the referenced section 248(b)(5) just yet, the statute clearly expresses that the burden is on the ANR to provide evidence in addition to its recommendations. So, what exactly is “evidence”? According to Black’s Law Dictionary, evidence is “[s]omething (including testimony, documents, and tangible objects) that tends to prove or disprove the existence of an alleged fact.”¹⁴⁷ In the case of wind power projects, that “something” arguably includes avian studies proving or disproving that a chosen site has an acceptable or unacceptable avian mortality rate. Thus, under this reasonable interpretation, the statute requires the ANR to supply bird and bat studies as evidence.

Section 248(b)(5) of title 30 supports this argument since it states in relevant part that the “evidence and recommendations” must show that facilities will not have an “undue adverse effect . . . on the natural environment.”¹⁴⁸ This section also makes reference to the stipulations in sections 6086 and 1424a(d) of title 10.¹⁴⁹ Section 6086(a)(8)(A) provides that prior to granting a permit, the PSB must determine if the development “will destroy or significantly imperil necessary wildlife habitat or any endangered species.”¹⁵⁰ In addition, section 1424a(d), which pertains mainly to concerns regarding water resources, states in subsection thirteen that the PSB may consider “studies, inventories and plans prepared by local, regional, statewide, national, or international groups or agencies” in its permitting decisions.¹⁵¹ Taking the statutory language into account, and not looking to any of the adjudications pertaining to wind projects, the plain

146. tit. 30, § 248(a)(4)(E).

147. BLACK’S LAW DICTIONARY 595 (8th ed. 2004).

148. tit. 30, § 248 (b)(5).

149. *Id.*

150. tit. 10, § 6086(a)(8)(A).

151. tit. 10, § 1424(d)(13).

language indicates that the burden to provide wildlife impact studies and recommendations is on the ANR.

Yet, in practice, the PSB requires that the applicant provide the data.¹⁵² The Hearing Officer, throughout his report for the East Haven decision, appeared to scold EMDC for its unwillingness to provide these studies.¹⁵³ The ANR chimed in only conceding that, “the proposed Project will probably not result in a large number of bat deaths, given that the Petitioner is seeking to construct only four turbines.”¹⁵⁴ The ANR requested further that if the PSB did grant a CPG to EMDC for this project, that the PSB should then force EMDC to stipulate “a minimum of one fall season of pre-construction radar and acoustics monitoring [and] post construction studies of bat mortality at the site.”¹⁵⁵ The ANR’s request is puzzling since the statute appears to require the ANR to provide the same studies that it so boldly requested that the PSB require of EMDC.

B. Policy Arguments for Why ANR Should Conduct the Studies

The better plan is for the ANR to conduct the avian studies, rather than relying on the applicants, for a variety of reasons including: (1) the need for unbiased data collected through the research of independent experts;¹⁵⁶ and (2) for the state to take a proactive approach in providing wind power and alternative energy sources for its citizens. The ANR retains “more than 600 scientists and professionals at the agency [who] are dedicated to protecting and improving the health of Vermont’s people and ecosystems and promoting the sustainable use of Vermont’s natural resources.”¹⁵⁷ In addition, three departments exist under its umbrella: the Department of Fish and Wildlife, the Department of Environmental Conservation, and the Department of Forests Parks and Recreation.¹⁵⁸ The Agency and its departments retain some of the best experts in the state on environmental conservation and wildlife protection issues and therefore it is in the best position to assess impact on wildlife for wind power projects.

152. East Haven Final Report, *supra* note 33, at 69.

153. *Id.*

154. *Id.*

155. *Id.*

156. See AM. WIND ENERGY ASS’N ET AL., *supra* note 139, at 63 (noting that the conferees at this workshop stated that a “conflict of interest” existed if an applicant hires consultants to do the impact studies).

157. Vermont Agency of Natural Resources, Welcome to the Vermont Agency of Natural Resources Website, <http://www.anr.state.vt.us> (last visited Mar. 7, 2009).

158. *Id.*

A counter-argument may be that political pressures may force the hand of the ANR Secretary one way or another regarding siting studies and projects.¹⁵⁹ As an executive agency, the Governor appoints the Secretary who serves in his cabinet. However, according to the ANR's policy on wind energy and other renewable energy development, the ANR, "supports an increased focus on energy efficiency, conservation, and development of new renewable energy sources in Vermont."¹⁶⁰ Although this report pertains to the ANR policy on ANR lands—outside the scope of the two project proposals in Sheffield and East Haven—it is important in detailing the ANR's policy on wind power in general as well as wind power for smaller scale projects such as that in East Haven. Pertaining to small scale wind power projects, the ANR states: "[t]he agency shall actively encourage and promote development of small-scale, renewable energy applications in appropriate locations on ANR lands."¹⁶¹ Thus, if the scientists at the ANR were charged with conducting avian studies required by the PSB, the internal policies of the ANR should theoretically take precedence over political pressures.

C. Who Will Pay for These Studies—What Other States are Doing to Grow Wind Energy

One may conclude that placing the burden on the ANR to conduct the wildlife studies for wind power projects means that the state will need to somehow come up with the funding to do so. Because state funds are limited, conducting such projects would perhaps mean higher taxes for the citizens. This need not be the case. Other states have come up with solutions to cut costs related to avian studies, while at the same time conducting enough studies to determine the impact level.

In Minnesota, for example, the state decided that individual siting studies were inefficient, and thus it implemented cost sharing of one large scale study among all developers in the area.¹⁶² In addition, once pre-construction studies are completed, Minnesota does not require post-construction studies.¹⁶³ Scaling back on the required studies may be a good place to start for Vermont. In order to convince the small developer or even

159. See David Gram, *Douglas 'Disappointed' with PSB Approval of Sheffield Wind Power Project*, CALEDONIA RECORD, Aug. 10, 2007, at A7 (noting that the Governor and the Public Service Department in recent times have been critical of wind power projects in the state).

160. AGENCY OF NATURAL RES., WIND ENERGY AND OTHER RENEWABLE ENERGY DEVELOPMENT ON ANR LANDS 3 (2004), available at <http://www.vermontwindpolicy.org/finalpol.pdf>.

161. *Id.* at 5.

162. U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 53, at 25.

163. *Id.*

promote community based ownership of a small neighborhood scale wind farm, the solution is perhaps to split the costs between the developers and the state, and for state representatives to petition for federal funding. If the federal government is serious about encouraging the states to develop renewable energy, it should put its money where its mouth is.

Another place to look to defer costs and increase efficiency in the PSB decision-making process is to adopt an approval process unique to the needs of renewable energy projects outside the scope of other utility projects. The state of Oregon, for example, promulgated regulations for the construction, design, and environmental impact standards specific to wind power projects.¹⁶⁴ In contrast, the PSB in Vermont uses the same standards to consider all utility connection projects in the state, which may not be a good fit for wind power projects.¹⁶⁵ Vermont may be better served if it designated specific standards for implementing wind power. For example, the governing statutes currently do not indicate how long and how many avian impact studies are required for a wind project. One complete year of studies from fall through spring should be enough data if proper planning and equipment is used. Studies for the two projects discussed in this note have ranged from one month to three years. A compromise of one year should be sufficient to analyze the complete migratory patterns of bird species in the area.¹⁶⁶

At the other end of the spectrum, Pennsylvania regulates its wind power projects at the local level only, thus the state is not involved in any of the regulatory processes.¹⁶⁷ The problem with this method is a lack of consistency in the state and the potential for local commissions to improperly weigh the impacts on wildlife.¹⁶⁸ Vermont should probably not go as far as Pennsylvania, but there is something to be said for allowing the PSB to weigh the benefits of the wind power project to the affected community with greater persuasive credence. For example, in their motion for reconsideration, EMDC cited to such benefits, including lower overall fuel emissions and economic benefits to the town in paying lower rates for

164. *Id.* at 28.

165. See VT. STAT. ANN. tit. 30, § 248 (2007) (discussing Vermont's standards for state utility projects).

166. See U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 53, at 25 (indicating costs at about \$200,000 per year for avian studies and that these cost can increase with delayed construction, which can happen if avian studies must be extended). Since studies are so expensive, minimizing these costs is one of the keys to efficient development of wind technology. According to the U.S. Government Accountability Office report, Vermont and the Northeast are not considered danger zones for bird migration patterns unlike northern California where there are problems. *Id.* at 49 app.II.

167. *Id.* at 29.

168. *Id.*

electricity and a potential for lower property taxes.¹⁶⁹ However, the PSB did not give much weight to these benefits when considering the CPG decision. Therefore, perhaps the statute should be amended to allow for community benefits to be one of the factors of consideration on par with other factors.

CONCLUSION

The United States uses only a fraction of its potential wind power capacity. At the end of 2006, this total wind power capacity was at 11,603 MW, however, by the end of 2008 this capacity grew adding an extra 8,300 MW—or the capacity to power two million more homes.¹⁷⁰ By the year 2020, predictions indicate a growth to seven percent installed capacity, and by 2030 the goal is for wind power to expand to providing as much as 20% of our electricity nationwide.¹⁷¹ As a clean and renewable source of energy, the environmental benefits include less reliance on fossil fuels and a reduction in harmful emissions. In addition, there are economic benefits as well. Economic benefits to Vermont farmers include supplementary income through land lease programs to developers.¹⁷² Local communities may also see decreases in their property taxes, an increase in jobs, and reduced cost of electricity due to living near the power sites.¹⁷³ Vermont currently enjoys only six MW of installed wind power at the Searsburg wind facility in Searsburg, Vermont.¹⁷⁴ However, Vermont's potential wind power capacity

169. Motion for Reconsideration at 1–2, Petition of EMDC, LLC, d/b/a East Haven Windfarm, No. 6911 (Aug. 31, 2006), *available at* <http://www.state.vt.us/psb/orders/2006/files/6911ordrerecon.pdf>.

170. American Wind Association, Annual industry outlook details increased growth spurred by strong demand, investment of private capital, as well as support of federal and state programs (Jan. 23, 2007), http://www.awea.org/newsroom/releases/Wind_Power_Capacity_012307.html; *see also* American Wind Association, Wind Energy Grows by Record 8,300 MW in 2008 (Jan. 27, 2009), http://www.awea.org/newsroom/releases/wind_energy_growth2008_27Jan09.html.

171. NAT'L RESEARCH COUNCIL, ENVIRONMENTAL IMPACTS OF WIND-ENERGY PROJECT 47 (2007); U.S. Department of Energy, Wind & Hydropower Technologies Program 20% by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply, http://www1.eere.energy.gov/windandhydro/wind_2030.html.

172. VT. COUNCIL ON RURAL DEV., *supra* note 37, at 44.

173. *See id.* at 44–46 (discussing the additional benefits of wind power projects to local economies).

174. American Wind Energy Association, U.S. Wind Energy Projects—Vermont, <http://www.awea.org/projects/projects.aspx?s=Vermont> (last visited Mar. 7, 2009); *see also*, Docket 7250 Information Page: Deerfield Wind Project in Searsburg and Readsboro, <http://www.state.vt.us/psb/document/7250Deerfield/deerfield-main.htm> (last visited Mar. 7, 2009) (noting that Deerfield Wind has applied for a new CPG to approve additional construction in the Searsburg and Readsboro site which would include constructing an additional fifteen turbines for a total of approximately forty-five additional MWs of installed wind energy).

is 537 MW.¹⁷⁵ Thus, if the state properly promotes this area of its energy portfolio, Vermont will emerge as a leader in renewable energy practices and realize these environmental and economic benefits.

Leadership means promulgating fair and appropriate rules and regulations for wind projects. The current Vermont adjudication process is time consuming and inefficient since it needlessly follows courtroom-type procedures, improperly embracing the Vermont Rules of Civil Procedure. Instead, formal but more tailored adjudication mandates, specific to the area of wind power, should be promulgated. Currently, the same rules that govern all utility connections govern wind power as well, which is not conducive to an efficient and effective permitting procedure. The state of Oregon, for example, promulgated rules that apply strictly to wind power,¹⁷⁶ and the Vermont Legislature should adopt a similar statutory mandate for the PSB.

As demonstrated in two wind power projects, a large scale and well financed developer such as First Wind realizes a competitive advantage since it can afford the high up front costs of wind power, including hiring its own consultants to perform expensive avian mortality studies.¹⁷⁷ Smaller companies may not be in that position and therefore, Vermont is discouraging smaller development companies as well as communities and small towns from seeking a CPG. In addition, the state is indirectly discouraging community-based ownership since the state's approval process does nothing to alleviate these up front costs. The state should commission the ANR to conduct wildlife impact studies and require more efficient means of conducting the studies so that several years of data are not required, but at the same time all parties are satisfied that the studies are complete. The state of Minnesota encourages community-based ownership and adopted only one large scale study where all developers split the costs.¹⁷⁸ Vermont may be well positioned to adopt a similar plan.

In a 2007 vetoed bill, H.520, also known as the Vermont Energy Efficiency and Affordability Act, the Vermont Legislature set a goal of twenty-five percent installed renewable energy by the year 2025.¹⁷⁹ Hopefully, despite the failure of this particular bill, renewable energy goals will be met. This note charges Vermont law makers to construct a plan that

175. American Wind Energy Association, *supra* note 174.

176. U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 53, at 28.

177. First Wind, In Depth Experience, <http://www.firstwind.com/aboutFirstWind/history.cfm> (last visited Mar. 7, 2009) (describing First Wind's extensive project financing).

178. U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 53, at 25.

179. H. 520, Vermont Energy Efficiency and Affordability Act, 2007-2008 Leg. (Vt. 2007) available at <http://www.leg.state.vt.us/docs/legdoc.cfm?URL=/docs/2008/bills/passed/H-520.HTM>.

works for all Vermonters, so that they may realize the environmental and economic benefits of renewable energy. Unless all layers of Vermont's government work together to meet renewable energy goals, including the Governor, Legislature, administrative agencies, conservation groups, and the citizens, Vermont's renewable energy goals will simply become "dust in the wind."¹⁸⁰

180. KANSAS, *Dust in the Wind, on POINT OF KNOWN RETURN* (CBS Records, Inc. 1977).