

A Glimpse into North Carolina's Current and Future Potential in Wind Energy

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"The answer my friend, is blowin' in the wind, the answer is blowin' in the wind..."
-Bob Dylan

Indeed, the answer may be blowing in the wind. With growing recognition of a need to establish permanent renewable energy sources, wind energy has quickly blown into the discussions across the world. This essay will look at the opportunities for wind energy units in North Carolina's two greatest locations of potential: the mountain region in the western part of the state and the coastal region in the eastern part of the state, with a focus on the legal obstacles that stand in the way of that progress.

Basics of Wind Energy

The basic concept of wind energy is rather simple. Wind turbines capture the energy of the wind's motion, known as kinetic energy, and use it directly or convert it into electricity and mechanical energy, similar to the science behind hydropower systems (that use the motion of water).¹ In general, wind energy offers a variety of benefits.

To begin with, wind energy is sustainable and renewable, which unlike the use of fossil fuels, adds security to the uncertain future of energy sources.² One of the most attractive aspects of wind energy is that the process of obtaining the energy from wind turbines produces no pollution or greenhouse gases.³ As wind energy continues to grow, it has the potential to reduce U.S. carbon dioxide emissions by nearly a third.⁴ In addition, wind energy is a source of electricity produced locally, thus possessing the capability to provide jobs in communities across

¹ *Wind Energy Fact Sheet*, AM. WIND ENERGY ASS'N, http://www.awea.org/documents/factsheets/Reliability_Factsheet.pdf (last visited Sept. 25, 2010).

² *Introduction to Wind Energy*, N.C. WIND ENERGY: APPALACHIAN STATE UNIV., <http://www.wind.appstate.edu/windpower/windpower.php> (last visited September 29, 2010).

³ *Id.*

⁴ AM. WIND ENERGY ASS'N, *supra* note 1.

the country.⁵ Yet while the national renewable energy focus is increasing on wind energy, it is important for North Carolina to play a strong role in this budding development, given its great wind energy potential.⁶ The U.S. Department of Energy estimates that with 1,000 megawatts (MW) development of wind energy, North Carolina alone would economically benefit \$1.1 billion, reduce annual CO₂ by 2.9 million tons, and save 1,558 million gallons of water annually.⁷

Western North Carolina

One of the major issues impeding on the growth of wind energy across the state, as well as in other parts of the country, is a lack of specific regulations outlining the legal process for acquiring permits and other development rights.⁸ This legal obstacle is particularly clear in the western part of North Carolina where the debate as to what type of permitting system should be adopted is only beginning.

In August, 2009, the State Senate voted to adopt Senate Bill 1068,⁹ which included rather significant changes to the North Carolina Mountain Ridge Protection Act of 1983 (commonly known as the Ridge Law).¹⁰ The purpose of the bill was to clearly set out the specifics of the permitting process for wind energy facilities across the state.¹¹ While the aim of the bill was considered a strong step toward the development of wind energy, the changes the bill made to

⁵ AM. WIND ENERGY ASS'N, *supra* note 1.

⁶ N.C. WIND ENERGY: APPALACHIAN STATE UNIV., *supra* note 2.

⁷ U.S. DEP'T OF ENERGY, *North Carolina Wind Map and Resource Potential*, http://www.windpoweringamerica.gov/wind_resource_maps.asp?stateab=nc (last updated Oct. 6, 2010).

⁸ N.C. WIND ENERGY: APPALACHIAN STATE UNIV., *supra* note 2.

⁹ S.B. 1068, 2009 Gen. Assemb. (N.C. 2009).

¹⁰ N.C. GEN. STAT. §14-113A (2009).

¹¹ S.B. 1068, 2009 Gen. Assemb. (N.C. 2009).

the Ridge Law created an effect that left many in the western part of the state unsatisfied due to its restraint on wind energy development.¹²

Prior to the proposed changes, the Ridge Law stated that “no county or city may authorize the construction of, and no person may construct, a tall building or structure on any protected mountain ridge”.¹³ While this language of 113A-209(b) was not altered, S.B. 1068 adopted a change to the meaning of “tall buildings or structures” in the definition section of the Act.¹⁴ The original Ridge Law stated that “tall buildings or structures” included anything over the height of 40 feet, but listed “windmills” as one type of structure that was not to be included in the definition.¹⁵ This meant that the Ridge Law did *not* prevent the construction of windmills in protected mountain ridges, even when they exceeded 40 feet, which is a crucial factor given that the average utility-scale, land-based wind turbine has a height of 442 feet from the base of the tower to the top of the rotor.¹⁶

However, S.B. 1068 amended the definitions section of the Ridge Law so that a windmill would only be permitted “if the windmill is associated with a residence, the primary purpose of the windmill is to generate electricity for use within the residence, and the windmill is no more than 100 feet from the base to the turbine hub”.¹⁷ This change essentially bans any commercial or community-scale wind power for western North Carolina.¹⁸

The main reason for opposing larger wind energy developments was the belief that they impede on the beauty the North Carolina mountains offer to its residents, while there were

¹² ENV’T N.C., *Wind Power in North Carolina*, <http://www.environmentnorthcarolina.org/issues/energy/wind-power> (last visited September 28, 2010).

¹³ N.C. GEN. STAT. § 113A-209(b).

¹⁴ S.B. 1068, 2009 Gen. Assemb. (N.C. 2009).

¹⁵ N.C. GEN. STAT. § 113A-206(3).

¹⁶ AM. WIND ENERGY ASS’N, *supra* note 1.

¹⁷ S.B. 1068, 2009 Gen. Assemb. (N.C. 2009).

¹⁸ ENV’T N.C., *supra* note 12.

additional concerns about the direct impact on the environment itself.¹⁹ While the State Senate did vote to pass the bill, it still must go through the State's House of Representatives.

Environment North Carolina and other environmentalist organizations have urged the House to reject the bill and adopt an alternative permit process, which would allow for the construction of commercial and utility-scale wind turbines without posing risks to the area's ecology and natural beauty.²⁰ During the 2010 session, the House did not vote on the bill, but it is expected to be one of the chief issues addressed in 2011.²¹

Although the passing of S.B. 1068 would effectively close the door on any large-scale wind energy sites, the bill would still permit the development of small-scale wind turbines.²² These smaller wind turbines, which generally have a height of less than 100 feet, can provide electricity for nearby homes, farms, schools, and businesses.²³ The turbines can power up to 6 average American homes, with the possibility of even more production for those constructed to be extra energy conscious.²⁴

While the hope for utility-scale wind energy sites remains a possibility for the western part of North Carolina, the future may lie in the smaller turbines which would be permitted, even with the changes to the Ridge Law in S.B. 1068.²⁵ The development of these residential wind energy opportunities may occur sooner than expected, with a 2010 Wind Energy Survey showing that the majority of residents in western North Carolina have great interest in residential

¹⁹ David Boaz, *North Carolina's Wind Energy Bill: The Debate Continues Over the Future of Wind-Power Generation in the North Carolina Mountains*, Festival of Legal Learning, Environmental Law Symposium, "A New, Progressive Environmental Law: What are the Signs?", <http://www.law.unc.edu/documents/clear/topic4boazfinal.pdf> (last visited on September 23, 2010).

²⁰ ENV'T N.C., *supra* note 12.

²¹ *Id.*

²² S.B. 1068, 2009 Gen. Assemb. (N.C. 2009).

²³ N.C. WIND ENERGY: APPALACHIAN STATE UNIV., *supra* note 2.

²⁴ *Id.*

²⁵ S.B. 1068, 2009 Gen. Assemb. (N.C. 2009).

development of wind energy, as well as a continued desire to see progress of wind energy on a larger scale.²⁶

Eastern North Carolina

While the western side of the state appears to be heading away from utility-scale wind energy development, the eastern side may be moving in the opposite direction. Last year, the University of North Carolina at Chapel Hill released an encouraging report following a nine-month study that assessed the possibility of installing wind turbines in sounds and off the coast of the state.²⁷ The study found that there is potential for developing wind farms off the coast, as well as within the Pamlico Sound.²⁸ Overall, the study discovered there are 55,000 MW of offshore wind capacity, which is enough to meet 130% of the state's energy demand.²⁹ As an added benefit, those estimates are based on locations that are not in areas that present serious military, environmental, or fishing concerns.³⁰ Additionally, another study conducted by the conservation advocacy group Oceana said that North Carolina has the largest offshore wind capacity, measured in terms of potential power, of any state in the country.³¹ Yet as with the western part of the state, there are obstacles standing in the way of wind energy progress, including legal issues which center on the lack of regulatory incentives and federal permitting.³²

Although the UNC report mentioned the possibility of wind turbine development in the Pamlico Sound, recent news suggests the Pamlico Sound will likely not be the location of North

²⁶ N.C. WIND ENERGY: APPALACHIAN STATE UNIV., *supra* note 2.

²⁷ Joseph J. Kalo & Lisa Schiavinato, *Coastal Wind: Energy for North Carolina's Future*, at 221-325 (June 2009), <http://www.climate.unc.edu/coastal-wind/Coastal%20Wind-%20Energy%20for%20NC2019s%20Future.pdf>.

²⁸ *Id.*

²⁹ Lisa Sorg, *N.C. ramps up for wind energy*, INDYWEEK.COM, <http://www.indyweek.com/indyweek/nc-ramps-up-for-wind-energy/Content?oid=1654035> (last visited on Sept. 8, 2010).

³⁰ *Id.*

³¹ Renee Schoof, *Wind Energy can power much of East Coast, study says*, MIAMIHERALD.COM, <http://www.miamiherald.com/2010/09/28/1845917/wind-energy-can-power-much-of.html> (last visited on Sept. 28, 2010).

³² Kalo & Schiavinato, *supra* note 27.

Carolina's future wind energy developments.³³ In August, 2010, Duke Energy announced its decision to shut-down a plan to set up three demonstration wind turbines in the Pamlico Sound.³⁴ The company concluded that the costs associated with permitting, design, and construction simply outweighed the potential benefits of the project.³⁵ The news highlights the problem of the state's lack of regulatory incentives for wind energy, especially given that there are more substantial incentives currently offered for other forms of alternative energy.³⁶ In addition to the financial challenge, concerns arose about the high potential of harming underwater vegetation.³⁷ In the end, Duke Energy determined that participation in large-scale projects offshore was simply a better approach than small demonstrations, suggesting that the real future in wind energy in the eastern part of the state lies well off the coastline.³⁸

The initial legal barrier for future offshore wind energy projects is the fact that only the first three miles of the coastline are considered state waters and state submerged lands.³⁹ After the three mile perimeter, the waters and submerged lands are under federal jurisdiction.⁴⁰ With the growing interest in alternative energy sources offshore, both within North Carolina as well as other East-coast states, the federal government has proposed a regulatory set up to lease federal submerged lands on the Outer Continental Shelf (OCS) for renewable energy projects.⁴¹ The

³³TTKN NEWS, *Duke Energy Changes Focus of Coastal Wind Demonstration Project with UNC*, (Aug. 31, 2010), <http://www.ttkn.com/technology/duke-energy-changes-focus-of-coastal-wind-demonstration-project-with-unc-3827.html>.

³⁴ *Id.*

³⁵ *Id.*

³⁶ Kalo & Schiavinato, *supra* note 27.

³⁷ TTKN NEWS, *supra* note 33.

³⁸ *Id.*

³⁹ Kalo & Schiavinato, *supra* note 27.

⁴⁰ *Id.*

⁴¹ *Id.*

OCS, which is the potential location for a number of wind energy developments, is the area of seafloor and subsurface between the state's boundary and the boundary of federal jurisdiction.⁴²

Yet even with the establishment of a federal leasing system, there are a number of federal laws that could apply and potentially raise problems for wind energy sites, including the National Environmental Policy Act (NEPA), the Clean Water Act (CWA), the Coastal Zone Management Act (CZMA), the Endangered Species Act (ESA), among others.⁴³ This list, which is far from complete, simply highlights the high number of federal law issues that could arise as states and energy companies continue to attempt to develop offshore wind energy projects.

While there is still a large amount of uncertainty pertaining to federal regulations for permitting offshore wind energy developments, there is equal uncertainty at the state level. As mentioned in the section concerning western North Carolina, S.B. 1068 would resolve some of the regulatory uncertainty by providing a regulatory framework for the state's permitting process for the siting and operation of wind energy facilities.⁴⁴ The bill, if enacted, would give the Coastal Resources Commission (CRC) the permitting authority for wind energy developments near the coastline.⁴⁵

In addition to the need for a clear regulatory framework for state level wind projects, North Carolina further needs to establish clear laws and regulations for alternative energy projects that are located solely in federal waters.⁴⁶ The reason for this is that there would be transmission lines and other related equipment that would cross state-owned submerged lands and other coastal areas, since projects in federal waters would still need to transmit the generated

⁴² Joseph J. Kalo, Lisa C. Schiavinato, & Scott Geis, *Developing a Management Strategy for North Carolina's Coastal Ocean*, at 18-37(April 2009), http://www.ncseagrant.org/images/stories/ncsg_pdf/documents/products/books/opscreport.pdf.

⁴³ *Id.*

⁴⁴ S.B. 1068, 2009 Gen. Assemb. (N.C. 2009).

⁴⁵ Kalo et al., *supra* note 42.

⁴⁶ *Id.*

power to the mainland.⁴⁷ Given North Carolina's offshore wind energy potential and its undeveloped and unclear legal framework, UNC's comprehensive report also laid out some specific recommendations that would provide clarity to those seeking to pursue wind energy projects.⁴⁸ The study recommends enacting a statute specifically addressing the leasing of state-owned submerged lands for wind energy development, and for those commissions with jurisdictional authority over water-based renewable energy projects to clarify their limits and concerns, which would lead to a clearer picture of the state's legal framework concerning these developing issues.⁴⁹

Even while the state and federal legal landscape for wind energy facilities is still forming, North Carolina is already making progress. In addition to Duke Energy's initial efforts to begin developing utility-scale wind projects, Apex Wind Energy recently splashed onto the wind energy scene by filing the first application to the federal government for a potential wind farm off the coast of North Carolina.⁵⁰ The company followed up UNC's wind energy study with one of its own and concluded that the best site with the highest wind energy potential was the Onslow Bay area, a 213 square mile ocean area more than 20 miles off the coast.⁵¹ Although the choice for the site was based partially on the relatively small number of obstacles, the application still required investigation of environmental, shipping, and military impacts.⁵² The project is still in its beginning stages, with plans for a five-year assessment of the area's compatibility for a wind farm hoping to begin upon the federal government's approval of the application.⁵³

⁴⁷ Kalo et al., *supra* note 42.

⁴⁸ Kalo & Schiavinato, *supra* note 27.

⁴⁹ *Id.*

⁵⁰ Gareth McGrath, *Onslow Bay looked at for first N.C. wind farm*, STARNEWSONLINE.COM, <http://www.starnewsonline.com/article/20100819/ARTICLES/100819557/1004?p=1&tc=pg> (last visited on Aug. 19, 2010).

⁵¹ *Id.*

⁵² *Id.*

⁵³ *Id.*

North Carolina's Future

In conclusion, there is clear evidence from a variety of sources that North Carolina has the potential to become one of the leading states in the development of wind energy. The state is in a truly unique position, since it has the benefit of developing wind energy projects offshore in the eastern part of the state as well as inland in the western region. While progress will be partially dependent upon the federal government developing national regulations, North Carolina must begin establishing its own set of state regulations, seen in legislation such as S.B. 1068.⁵⁴ By creating a clearer legal framework, North Carolina will provide companies such as Apex Wind Energy, which is seeking to operate the first working offshore wind farm in the country, with comprehensive guidelines for their projects development.⁵⁵

In addition to establishing regulatory frameworks, North Carolina and the federal government must also work to provide tax credits and other financial incentives, such as those offered to other forms of alternative energy, to companies in order to promote wind energy developments by helping offset the high up-front costs of such projects.⁵⁶ Even with the myriad of potential obstacles, North Carolina has the opportunity to become one of the leaders in the expansion and progress of wind energy.

⁵⁴ Kalo & Schiavinato, *supra* note 27.

⁵⁵ McGrath, *supra* note 50.

⁵⁶ Kalo & Schiavinato, *supra* note 27.