Legal framework for wind projects: a US perspective

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1. Introduction

After lagging behind Germany and other European countries for 20 years, the United States is now the leader in installed wind power capacity.[1] In 2009 the United States had 35,064 megawatts (MW) of installed wind power capacity, accounting for 22.1% of the world's total.[2] Despite the impact of the global credit crisis on project finance, the US wind power sector has continued to experience rapid advances. For example, the United States installed 9,996MW in new wind power capacity in 2009, while Europe installed 10,526MW and Asia 15,442MW during the same period.[3]

The increased viability of wind power projects in the United States is due in the main part to:

- the country's wind energy resources;
- technological advances in wind turbine design and construction; and
- shifts in the economics of wind power generation.

In addition, energy policy and financial and tax incentives have spurred the development of wind power projects. All factors contributed to the US Department of Energy's finding that wind power could provide 20% of the country's electricity needs by 2030.[4]

1.1 The US wind energy capacity

In 2009 wind power provided 39% of all new electricity generating capacity installed in the United States.[5] However, a 2010 study from the US Department of Energy shows that the potential for wind energy in most US states goes well beyond the current installed wind power capacity. This study was conducted as a collaborative project between the Department of Energy's National Renewable Energy Laboratory and AWS Truewind LLC. It found that onshore US wind resources could generate around 37 million gigawatts annually.[6] This is nine times greater than the overall

1 *Global Wind Report 2009*, Global Wind Energy Council, p10.
2 *Id*.
3 *Id*, p9.
4 US Department of Energy, Energy Efficiency and Renewable Energy, "20% Wind Energy by 2030", July 2008 (www1.eere.energy.gov/windandhydro/pdfs/41869.pdf).
5 American Wind Energy Association, "US Wind Industry Annual Market Report Year Ending 2009".
6 National Renewable Energy Laboratory and AWS Truewind LLC Resource Study (www.windpoweringamerica.gov/wind_maps.asp).

current US electricity consumption.[7]

However, the expansion of new wind power generating capacity requires expanding the US transmission grid to allow access to superior wind resource regions. The 10 windiest US states are Texas, Kansas, Montana, Nebraska, South Dakota, North Dakota, Iowa, Wyoming, Oklahoma and New Mexico.[8] Many of the windiest parts of these states have no immediate or convenient access to transmission lines. By contrast, one the benefits of some potential US offshore sites is their proximity to transmission lines and large population centres.

The National Renewable Energy Laboratory's wind resource study referenced above does not take into account the development of offshore sites. As of May 2010, the United States had no operating offshore (oceanic) wind power generating projects. By way of comparison, there are 830 installed and operational offshore wind turbines across 39 wind farms in nine European countries, totalling 2,063MW.[9] However, the US offshore installed and operational capacity is bound to increase soon as many states in the northeastern United States enjoy a large and strong offshore wind resource, with very limited opportunities to develop wind power generating sites on land. Along these lines, in April 2010 US Secretary of the Interior Ken Salazar announced his approval of the first US offshore wind project to be constructed on Horseshoe Shoal in Nantucket Sound, off the coast of Massachusetts.[10]

1.2 Energy policy and financial incentives

Renewable portfolio standards (RPS) are state rules and regulations that require retail electricity suppliers to obtain certain portions or percentages of their supply from renewable energy sources by certain dates. As of May 2010 over 30 US states, plus the District of Columbia, had binding or voluntary RPS programmes in place.[11] Under most RPS programmes, retail electricity suppliers may purchase tradable credits that represent an equivalent amount of renewable energy production in lieu of purchasing power supply directly from a renewable energy producer. For each unit of power that an eligible producer (eg, a wind power generator) generates, a credit is issued. These credits (sometimes also referred to as 'renewable energy certificates') can then be sold either together with the power generated or separately to retail electricity suppliers.

These credits generally increase flexibility for retail electricity suppliers and reduce the cost of compliance with the purchase requirements. The RPS have greatly increased the demand for wind-generated power. Prospects for growth of wind power are good as additional states adopt standards and the states that already have such programmes in

7 American Wind Energy Association (www.awea.org/newsroom/releases/02-18-10_US_Wind_Resource_Larger.html).

8 National Renewable Energy Laboratory and AWS Truewind LLC Resource Study (www.windpoweringamerica.gov/wind_maps.asp).

9 European Wind Energy Association (www.ewea.org/).

10 US Department of the Interior, press release (www.doi.gov/news/doinews/Secretary-Salazar-Announces-Approval-of-Cape-Wind-Energy-Project-on-Outer-Continental-Shelf-off-Massachusetts.cfm).

11 See Renewable Energy World (www.renewableenergyworld.com/rea/news/article/2010/05/where-the-wind-blows-and-sun-shines) and the US Department of Energy Database of State Incentives for Renewables and Efficiency (www.dsireusa.org/).

place increase their requirements for renewable energy resource supplies.

The US Congress has authorised various tax and financial incentives to encourage the development of renewable energy projects. The choice of which financial incentive programmes are best suited for a particular project can be a complicated matter and requires the consideration of a variety of logistical, financial and legal factors. In addition, most federal financial incentive programmes are authorised by Congress and are subject to funding and programme availability. New financial incentives at the federal level are being considered; developers of wind energy projects should be sure to consult with legal and financial advisers with regard to which, if any, programmes are available and suitable for the project being considered. Besides, many states have their own financial incentive programmes. While the federal programmes mentioned above are discussed in more detail below, developers of wind energy projects should also consider what state financial incentives may be available.

1.3 Technological advances

The technology for wind power generation has advanced rapidly over the past 10 years. For example, in 2006 wind turbines were on average 11% larger than in 2005.[12] However, research, design and development in this area have focused on more than achieving gains in wind turbine size. Advances in the design and composition of blades, rotors and tower structures have been combined with improvements in drivetrain design (gearbox, generator and power conversion) and control systems. As more technology innovations are put into use, the cost and performance challenges of wind power generation are becoming less daunting. Thus, in 2009 work was completed on the Horse Hollow project – the world's largest wind farm – near Roscoe, Texas.[13] This project is owned by Florida Power & Light through its subsidiary Nextera Energy. It has an installed capacity of 735.5MW.[14] With the assistance of technological innovations, large-scale projects such as Horse Hollow should become more common in the near future.

The recent advances in wind power generation provide a positive example of the benefits of combining active government policy, financial incentive programmes and technological momentum to create formidable increases in wind power generation capacity.

Although the potential for continued growth in installed wind power capacity in the United States is great, there are some challenges. Some of these relate to:

- upgrading, improving and expanding the US transmission system to enable wind power generated in outlying areas or offshore to be delivered to urban areas in need of supply;
- lowering the capital costs (through government-sponsored policies and programmes such as production tax credits, investment tax credits and cash grants); and

12 US Department of Energy, Energy Efficiency and Renewable Energy, "20% Wind Energy by 2030", July 2008 (http://www1.eere.energy.gov/windandhydro/pdfs/41869.pdf), p5.
13 www.windpowerworks.net/12_case_studies/horse_hollow_united_states.html.
14 www.nexteraenergyresources.com/content/where/portfolio/pdf/horsehollow.pdf.

- resolving siting and permitting issues (eg, regulatory approvals, wildlife concerns, tribal and historic lands restrictions and zoning issues).

2. Siting and permitting wind energy projects

Although wind power is one of the cleanest and least environmentally harmful sources of energy, it does not enjoy preferential permitting treatment in the United States. In addition, while wind energy projects generally garner widespread public support, siting such projects can raise significant local concerns. However, almost all wind power development projects begin with a determination of whether a potential site has enough wind to support a wind farm.

Many project developers identify sites through the use of wind resource maps. These maps typically show the predicted mean annual wind speeds at certain heights above the ground. Areas with annual average wind speeds of around 6.5 metres per second and greater at an 80-metre height are generally considered to have suitable wind resource for wind power development.[15]

Wind resource at specific sites should be measured for at least a year to understand how winds vary over the four seasons. The wind resource assessment process can be complicated and time-consuming. Large-scale projects typically incorporate numerous wind measurement locations and varying heights, wind direction, shear and terrain locations. New wind modelling technology also provides wind power developers with a crucial understanding of complex terrain, turbulence and wake factors.[16]

While choosing a site with a good wind resource is fundamental to a project's chance of success, a variety of other factors can determine whether the project is viable. The siting of wind power projects involves a varied set of laws. The wind energy siting process tends to be a highly localised one, with each project's permitting requirements being specific to:

- the local permitting jurisdiction (municipality, county, state or federal);
- the characteristics of the site; and
- the technical scope of the project.

State and local authorities have different responsibilities with regard to permitting or approving wind power projects.

The diversity and complexity of local and state permitting and approval requirements in the United States cannot be overstated. In many states the primary site permitting and approval jurisdiction rests at the local level where projects do not trigger federal authority (eg, being located on land that is under the jurisdiction of a federal authority). This means that locally elected and appointed officials and local agency employees will make siting, permitting and approval decisions. For projects located in rural areas, the site permitting and approval jurisdiction is usually with the relevant county. Projects located in urban areas may be subject to county, city or another municipal jurisdiction. Local authorities are usually charged with the

15 National Renewable Energy Laboratory and AWS Truewind LLC Resource Study (www.windpoweringamerica.gov/wind_maps.asp).

16 US Department of Energy, Energy Efficiency and Renewable Energy (www.windpoweringamerica.gov/ne_siting.asp#wind_resource).

responsibility of ensuring that projects comply with zoning, development and building standards. These authorities may also be concerned with environmental standards, water quality and community development aspects.

Wind power projects under local siting and permitting jurisdiction must typically go through a conditional use permit process in which an application for a project is submitted by a developer to a local commission or other agency responsible for approving and issuing permits and approvals for site development. Developers may be required to work with a variety of local authorities, such as zoning boards and county commissioners. A local agency will approve and issue a permit for site development that is usually a 'conditional use permit'. Conditional use permits typically require that:

- an applicant show that the potential project will be compatible with surrounding and adjacent land uses; and
- the development project have met with the approval of state or federal agencies (eg, those concerned with environmental matters, water quality issues or impacts on wildlife).

Since the local site permitting and approval process requires the involvement of elected and appointed officials, securing community support is crucial. Projects that do not enjoy the support of a large component of the citizens and/or have garnered special resistance (no matter how small) can face significant struggles in the permitting and approval process. For large projects that require access and road easements, the support of affected land owners is also necessary. In any event, whether a potential wind power project is large or small, community support is crucial to the local permitting and approval process. Developers often engage in public information campaigns to ensure that the local public understands the employment benefits, the positive impacts on tax revenue and the importance of clean energy. Even with the recent surge in US support for clean energy projects, developers should seek to increase their chances of successfully completing the local permitting and approval process by consulting closely with local agencies, commissions, communities and special interest groups.

States may also control the site permitting and approval process through special decision-making bodies or through rules and regulations that establish jurisdiction over the permitting and approval of wind power projects. A minority of states have energy siting councils or boards that have jurisdiction over the siting of wind power projects, usually in conjunction with the state utility commission (the commission that is charged with regulating certain aspects of the state electricity industry, such as the supply of electricity service).[17] Wind power developers should be sure to understand whether, and the extent to which, their potential project is affected by state permitting and approval jurisdiction.

Wind energy projects may require the participation of a federal agency if the potential site is located on (or requires a right of way through) land administered by a federal agency, such as:

17 Wind Power Siting Regulations and Wildlife Guidelines in the United States (www.batsandwind.org/pdf/afwastsitsum.pdf).

- the US Bureau of Land Management;
- the US Forest Service;
- the US Corps of Engineers;
- the Minerals Management Service; or
- any other agency that manages land for the US federal government.[18]

Before any federal agency can approve a project on federal land, the agency must consider the environmental impact of its decision. This environmental review requirement is set forth in a federal procedural law known as the National Environmental Policy Act.[19] The act is significant because, depending on the level of review required, the determination can take more than a year. Developers should carefully consider the potential impact of the act's requirements on their project and their development timeline.

As with the structure of state and local permitting and approval jurisdiction, federal jurisdiction can be equally complicated. Depending on the location of the development site, various federal agencies may participate in the permitting and approval process. The following is an overview of the federal agencies that have mandates related to wind power development projects:[20]

- The Federal Aviation Administration conducts aeronautical studies on all structures taller than 60 metres for possible interference with air traffic and military radar. Developers are usually required to submit an application to this agency in connection with each wind turbine.
- The Bureau of Land Management has a Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States. This impact statement sets forth best management practices, sets standard requirements for projects and lays the environmental groundwork to expedite permitting for projects located on Bureau of Land Management land in 11 western states.
- The US Army Corps of Engineers is responsible for issuing development permits for projects that will affect wetlands.
- The US Fish & Wildlife Service has the authority to prosecute violations of certain rules and regulations protecting migratory birds.
- The Minerals Management Service oversees the permitting of offshore wind power projects on the outer continental shelf.
- The US Forest Service approves projects subject to its management jurisdiction.

As illustrated by the foregoing discussion, the federal government's role in the

18 See the following websites for more information regarding these US federal agencies:
• www.blm.gov/wo/st/en.html (US Bureau of Land Management);
• www.fs.fed.us/ (US Forest Service);
• www.usace.army.mil/Pages/default.aspx (US Corps of Engineers); and
• www.mms.gov/ (Minerals Management Service).

19 42 USC §4321 *et seq*.

20 US Department of Energy, Energy Efficiency and Renewable Energy, "20% Wind Energy by 2030", July 2008 (http://www1.eere.energy.gov/windandhydro/pdfs/41869.pdf), p5.

site permitting and approval process varies greatly depending upon project circumstances, particularly site location. Whether or not a potential development site is located on (or requires a right of way through) federal land, careful consideration must be given to the jurisdiction of federal agencies.

One of the largest and most controversial issues in the siting and approval of wind power projects is the impact on wildlife. Birds are particularly affected by wind projects. US federal law provides some protection to a large portion of avian species with habitats in the United States. The most important federal avian laws are the Endangered Species Act, the Migratory Bird Treaty Act and the Bald Eagle Protection Act.[21] These laws generally prohibit injuring or killing certain protected classes of bird. The concerns of permitting agencies regarding the impact on birds (and bats) can require that developers and/or permitting agencies conduct long and costly studies to determine the answers to wildlife impact questions.

While the Endangered Species Act provides a means for developers to obtain a permit for the incidental injury or killing of protected animals, the Migratory Bird Treaty Act and the Bald Eagle Protection Act do not provide for a similar permitting method. To avoid violating the wildlife protection laws, most developers give careful consideration to project layout and design aspects so as to minimise the injury or killing of protected wildlife. Developers also gather data to determine the project's harmful affects on wildlife. Typically, at least one year of data regarding wildlife use of the potential site is compiled to set a baseline for the project. After construction of the project, developers continue to gather wildlife impact data and compare new data to the baseline survey. Post-construction data on wildlife injuries and fatalities assist developers with making operational adjustments to minimise exposure to liability under applicable laws.

Many developers also attempt to reduce liability under wildlife protection laws and gain favour with permitting agencies by adopting wildlife protection plans. Such plans set out the policies that a developer will follow to mitigate the impact on wildlife. However, the adoption of a wildlife impact plan will not provide legal protection in the event that a protected species is killed or injured as a result of the project.

When making siting decisions, developers should determine whether the site area is inhabited by a protected species (at both state and federal levels). There are databases available that show species native to particular geographic areas. Such databases can assist in preliminary siting decisions with regard to the potential of project approval and liability under wildlife protection laws.[22]

There are also databases available that describe historical and cultural sites. Many Native American tribes, as well as local and state governments, have designated certain cultural resources as protected (eg, physical sites listed on the National Register of Places, certain fossils and human remains). It is important to evaluate thoroughly potential development sites to understand the impact of development

21 The Endangered Species Act can be found at 16 USC §1531 *et seq*; the Migratory Bird Treaty Act can be found at 16 USC 703 *et seq*; and the Bald Eagle Protection Act can be found at 16 USC §668 *et seq*.

22 For example, see the US Fish & Wildlife Service Endangered Species Program Species Report (www.fws.gov/ecos/ajax/tess_public/pub/stateOccurrence.jsp).

on such cultural resources. During the construction phase, mitigation measures may be necessary to avoid harming or disturbing these protected resources.

The consideration that must be given to the potential impacts on Native American cultural resources is important because Native Americans own large areas of land with valuable wind resources. These resources have led many developers to attempt to site wind power projects on or near Native American lands. However, siting wind power projects on Native American lands comes with unique jurisdictional challenges. Both federal and tribal law governs easements, leases and other uses of Native American lands. Some state laws may also apply.

The US government owns a large portion of Native American land in trust for Native Americans; federal Indian law governs the lease of such land. Under federal Indian law, tribes can lease tribal land for up to 25 years and may include an option to extend the lease for another 25 years.[23] In addition, some specific tribes may lease tribal land for up to 99 years. Most tribal land leases for land owned in trust by the US government must be approved by the Bureau of Indian Affairs and comply with the requirements set out by the National Environmental Policy Act.

Adding to the complexity, a few tribes can lease land owned in trust by the federal government for up to 75 years without approval by the Bureau of Indian Affairs. Other leasing restrictions apply to tribal corporations operating under charters issued by the secretary of the interior.[24]

Developers must work closely with Native American tribal governments during the site evaluation process. Tribal governments may agree to adopt new laws or amend existing laws to facilitate wind power projects. Of course, a careful review of the laws affecting development on the particular Native American lands under consideration should be conducted at the beginning of the project.

This overview of the siting issues with which developers must contend in developing US wind power projects is necessarily brief. The foregoing discussion aims to highlight:

- the complexity of the site permitting and approval processes; and
- the extent to which multiple jurisdictional authorities may be involved.

In addition, this is a rapidly evolving area of the law. Careful planning and extensive due diligence are required in the early phases of any project to ensure that the permitting and approval process is thoroughly understood.

3. Power purchase agreements

3.1 Characteristics

Generating units, including those powered by wind, will produce capacity, energy and certain ancillary services for sale in the marketplace. These products are often sold to an individual customer under a bilateral contract commonly referred to as a 'power purchase agreement'. The agreement describes the terms and conditions of

23 25 USC §415.
24 25 USC §477.

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