

A NEW FOUNDATION?

Five ways to address the challenges facing future wind power construction and sustainability in the U.S. market.

By Julian Bell



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BEING PART OF THE UNITED STATES wind industry is challenging right now. For contractors to manufacturers, to developers, and every sector of the supply chain in-between, it's challenging. The boom-and-bust cycles created by the lack of consistency in the United States market for renewable energy and the uncertainty surrounding the passage of the Production Tax Credit significantly hinder the industry's ability to develop a consistent outlook. To overcome these challenges, we must learn how to fashion our business plans around them and become active participants in doing everything we can to be part of the solution. In this article we will explore some of the major challenges facing wind power

and five ways to overcome them as an industry, so as we enter a new year we can understand the task before us.

While wind must compete on a price basis for power purchase agreements against large and mature industries (oil, natural gas, coal and nuclear), it has never had the stability over a long enough period of time that it needs to develop the reliable and solid supply chains necessary for true competitiveness on a price level. For sure, wind is closer now than ever before to "grid-parity," but more work remains to be done. While we all look forward to the day when regulatory support is no longer needed to assist the industry in competing on a price level with fossil fuel-produced electricity, the fact remains that a stable



Figure 1: Aerial view of the Forest Creek Wind Farm near Big Spring, Texas.

and consistent market for wind power is a prerequisite for the industry to reach its natural price point.

Until the wind sector has that stable and consistent market, all industry sectors need to be aware of the major challenges facing the wind sector. We must learn how to fashion our business plans around these challenges and become active participants in doing everything we can to be part of the solutions to these challenges. We are all proud that we produce an end product (i.e. wind-powered electricity) that is both valuable and noble. Wind-powered electricity is produced without any harm to our environment through emissions or other production byproducts, and without any fuel cost. However, despite the signifi-

cant societal and economic benefits of wind-produced electricity, our ability to continue to produce wind power is uncertain without a long term and consistent market.

As a nation, we continue to produce the vast majority of our electricity using fuel sources that will eventually be exhausted, whose use harms our environment, that require vast amounts of water (itself a limited resource), and that leave behind harmful byproducts for future generations to handle. Our collective challenge as an industry is to face all of the hurdles before us and together carve out a market that is consistent, sustainable, and profitable. Wind power and other renewables cannot provide all of the power needed by our nation; they are not technologically suited to do so. However, there is a great economic value over the long run, and great value to generations to come, in having renewable energy as a significant part of the total mix of electricity production sources in the United States.

The primary challenge we have is to develop a market for wind energy that is not subject to the dramatic up and down swings in the amount of installed wind energy capacity that we have historically seen. This feast-or-famine atmosphere—created by a number of complex and significant factors—prevents anyone in the industry, be they balance of plant contractors, subcontractors, material suppliers, equipment manufacturers, or project developers, from developing consistent business plans and pricing levels. This uncertainty requires any company in the wind industry to develop a survival strategy. In addition, anyone that desires to participate in the industry must have a clear understanding of the fundamental reasons that our industry has such high swings. Without such an understanding, companies will not be successful in being profitable in the industry over the long term.

The absence of an energy policy in our country that values anything other than the lowest apparent price of energy to the consumer has prevented the industry from being able to create the momentum necessary to build the appropriate supply chain and labor force resulting in a true low cost of energy. Despite this lack of policy, the wind industry—particularly since 2006—has consistently driven down the overall cost of installed wind power. With the Production Tax Credit (PTC) expiring again this month, contractors, suppliers, and others in the supply chain must once again take a look at the major issues facing our industry as they evaluate their business plans for 2014 and beyond and assess the best ways to be successful during this very challenging time.

PUSH FOR A LEVEL PLAYING FIELD

All forms of energy production in the United States benefit from one form or another of governmental support. That is, no power producing sector in the U.S. is “subsidy-free.” The wind industry’s primary regulatory support is the Production Tax Credit and the industry has been the subject of a considerable amount of criticism over the past several years as Congress has taken a more partisan approach to “subsidies.”



Figure 2: A rotor is lifted into position for installation onto the nacelle.

The fact is, however, that wind is not alone in receiving government support. Nuclear power could not exist in its present form in the U.S., if at all, without governmental action shifting a number of major industry risks from nuclear project owners and investor to U.S. taxpayers. The coal industry benefits from significant subsidies, among them a tax credit for the production of non-conventional fuels. Natural gas and oil benefit from a number of significant subsidies, including favorable tax treatment for expenses for drilling costs, deductions for income earned from extracting oil or gas in the United States (Domestic Manufacturer's Deduction), the percentage depletion deduction, and other permanent tax code provisions.

While every industry with which wind competes benefits from significant government support, wind and other renewables are alone in having to fight year after year to level the playing field, as theirs are the only energy sectors without permanent support.

The PTC has been valuable in giving the wind industry an extra push forward in its march to be price competitive with better funded and more mature forms of power production. However, the PTC has become a highly partisan issue and its renewal becomes more challenging and less certain each time it expires. The industry, through the American Wind Energy Association (AWEA) spends an extraordinary amount of time working with members of Congress to assure PTC renewal. In recent years, although the PTC has been renewed, it has come at such a late date that development efforts for new projects has

been put on hold, thus creating a period of time in which construction of projects is delayed so that development and financing efforts can be completed. The uncertainty surrounding PTC renewal has been the primary reason for the abrupt up and down swings in the number of installed capacity of wind over the years.

Most industry participants acknowledge that the PTC will not stay in place indefinitely and that the industry needs to prepare for a future with no PTC. However, consistent governmental support for wind, and other forms of renewable energy, is both important and justified.

It is truly unfortunate that the PTC (and any other form of government support for wind and other renewables) has become a partisan issue. It should not be. We should base the necessity for government support for the wind industry on the non-partisan fact that there is economic and societal value in energy production from sources of energy, like wind, that:

- Offer consistent power pricing to the consumer because they will never be subject to an increase in the price of its fuel;
- Foster good stewardship of the earth's limited resources because they will never use a fuel source that will eventually be exhausted and whose extraction from the earth is dangerous and results in illness, injuries and loss of life;
- Do not use a fuel source that harms the environment as



Figure 3: Concrete crew places concrete on the base section of a spread footing foundation.

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Figure 4: Nacelle being delivered and readied for unloading.



Figure 5: Graders remove the turning radius after deliveries are completed.

it creates electricity;

- Do not use a fuel source that creates hazardous and potentially lethal wastes as a byproduct of electricity production; and
- Use little or no water in the production of electricity.

LOWERING COST OF ENERGY THROUGH INNOVATION

As an industry, we must continue to push forward with technological improvements that will result in a lower overall cost of wind energy. Lowering the cost of energy is always going to be an important

issue for the wind industry, as long as we continue to compete with more mature power sources. Over the past several years, turbine manufacturers have done an incredible job of increasing the output of their turbines through improvements in turbine efficiency, longer blades, and higher hub heights. One of the next advances in the U.S. will be the use of even higher hub heights through the use of concrete towers. Full, or partial, concrete towers will allow turbines to reap the power available from the richer wind resources available at heights well above 100 meters. As hub heights increase, areas of the country that have been all but written off for wind energy will be potential development sites, such as the Southeast.

NEED FOR MORE FINANCING MODELS

Wind projects have historically been built using two primary mod-

els: balance sheet financing and project financing. Balance sheet wind projects are funded by entities (typically investor owned utilities, well-financed independent power producers, turbine manufacturers, or publicly owned oil companies) with sufficient internal capital to fund a project without the need for outside funding sources. On these projects, there is no reliance on third-party debt or outside lenders. On the other hand, project-financed projects are funded by debt secured by the project's assets and its ability to produce electricity and generate revenue. While these funding models have provided the vehicles for a tremendous amount of installed wind capacity, the industry needs a wider variety of funding models to increase the available funds for wind projects. A wider variety of funding models will also help to lower the funding costs of wind projects.

The most commonly talked about models are real estate investment trusts (REITs) and master limited partnerships. REITs can potentially provide a large source of new funds and significantly lower funding costs for wind projects. However, before REIT financing is available for energy projects, further IRS guidance is needed on the eligibility of energy assets as a REIT investment. As an industry, we need to continue to press Congress for the needed approvals and open up REIT financing for wind projects.

In addition, the use of master limited partnerships (MLPs) as a vehicle for ownership of wind projects can dramatically lower funding costs, and dramatically increase available funds for wind projects. Again, governmental action is required in order to allow the use of MLPs for renewable energy projects. Although current law permits the use of MLPs for oil and gas projects, MLPs cannot invest in wind proj-

ects. As an industry, we need to continue to press Congress to open up MLPs to investment in wind projects.

OVERCOME TRANSMISSION CONSTRAINT

A quick look at a map of the U.S. showing wind resources, load centers and available transmission reveals that a great deal of the land with the best wind resources is located in areas far from any significant load center and with no existing transmission line available to carry power to that load center. The U.S. electrical transmission system is not—as many in

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Figure 6: Crews nearing completion of substation work.



Figure 7: Wind turbines against a red Texas sky.

the general public assume—a national system built with an overall plan to provide power to the nation. Our existing transmission grid is a collection of local and regional systems that have been built over the last century with local and regional interests largely in mind.

Traditional forms of power production that use transportable fuel have a great deal of flexibility on where they locate. They can be built closer to load centers and within reasonable distances of available transmission. In addition, they are typically larger facilities and have more available capital to include in their construction large and lengthy transmission lines if necessary to reach existing transmission. Wind farms, however, are typically smaller than the average fossil fuel or nuclear power plant and must be located where the wind blows. Accordingly, the proximity of available grid transmission is a critical component of every wind project.

In order to carry wind-produced electricity from the resource rich areas to the load centers, new transmission is needed on a large scale. Companies like Clean Line Energy Partners, a privately held company working to develop, design, fund and build transmission lines from the windiest areas of the U.S. to distant load centers, are stepping in to fill this transmission void. As an industry, we need to support the very important work being done by companies like Clean Line. In addition, we need to work closely with AWEA to develop regulatory solutions to

streamline the process of building new transmission and encouraging proper regulatory oversight and guidance.

MONITORING NATURAL GAS PRICING

There is no easy way to sidestep the fact that the wind industry must successfully compete with natural gas pricing for the foreseeable future. The increased use of fracking as a means of extracting natural gas from shale deposits has greatly increased the supply of domestic natural gas and driven its price to historically low levels. Many utilities and other power producers are choosing to supplement their base load power production with gas plants instead of wind because of the attractive fuel pricing. There is wide disagreement on how long natural gas pricing will remain at or near these levels, and every segment of the wind industry supply chain must play a part in helping overall wind energy pricing remain competitive.

The U.S. wind industry provides a valuable product—clean energy from a renewable source. Despite the current efforts of the fossil fuel and nuclear industry to turn public opinion away from renewables, we must work together as an industry to put forth our message that there is inherent value in the production of clean power. It will take efforts at every level of the supply chain for the wind industry to remain cost competitive and establish the stable and consistent market needed for long-term sustainability. ✎