

THE BIG DEBATE

For many, 2012 will go be defined as a watershed year for the wind industry in North America – and yet we've still got a couple of months to go! With that in mind, we've brought together a roster of some of the finest minds in the industry, and pitched them a selection of challenging questions. Their answers are in equal parts engaging, illuminating, educating – and sometimes surprising.

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PES: Welcome to the magazine. Before we head into the main subjects of the day, can you tell us a little about your organization and how it serves the industry?

Vincent DeVito: Yes, thank you for the opportunity. I am a partner at the law firm of Bowditch & Dewey, LLP with an international energy practice based in Boston. I also spearhead the Institute for Energy and Sustainability based in Worcester, Massachusetts. The bulk of my corporate law work focuses on energy project development and I have had the opportunity to analyse such projects as Cape Wind and other developments across the United States from a business and legal perspective.

At the Institute for Energy and Sustainability, we focus on the economic benefits of clean technology in Central Massachusetts. We have uniquely development and astonishing partnership with our academic institution, such as Worcester Polytechnic Institute, Clark University, and Quinsigamond Community College, corporations, such as National grid, USA, and a full portfolio of local companies and non-government organization.

In short, IES is central New England's green business zone. Its mission is to attract clean energy technology and renewable energy companies to the region. Each day, we build on the region's assets and reputation as an incubator of innovation. Our priority is to create an environment for those seeking

economic opportunity and advantage in this sector and to support the growth of jobs establishing a zone of world-class clean technology companies.

Shawn Lamb: Ecotech Institute is the first and only school with the primary focus on clean energy technology. Our goal is to prepare students for direct entry into the job market and enhance their opportunities for growth and advancement. Our students receive an Associate of Applied Science degree. We teach the skills that industry leaders and employers have said are missing when they search for employees. Those skills combine solid theory with a significant amount of hands-on training. Combining those factors makes our graduates highly marketable.

One of our keys to success is our commitment to the industries we serve. We work very closely with business and industry leaders to keep our curricula current and relevant to industry needs. We assist employers by providing qualified workers who are educated in the professional and technical skills they need. We are very customer oriented and recognize that our customers include our students, our employers, and our community.

Rocky Sease: SOS Intl is a leading provider of training and consulting services to the power industry. We deliver a full suite of services across all areas of power utilities

from generation to transmission to distribution. SOS offers classroom, online and custom courses, accompanied by sophisticated computer simulation – all designed using the latest systematic approach to training and adult learning theory. We incorporate the latest practices in Human Performance Improvement and Human Error Prevention in our training as we have for years. Our training focuses on taking a new utility employee and creating an experienced worker as quickly as possible. Our compliance consulting services help entities manage risk and ensure reliability for the bulk electric system. Our clients encompass the full range of power fuel sources from the traditional sources such as coal and gas to renewables such as wind, water and solar.

Timothy Kemper: Reznick Group is a top 20 national accounting firm that includes an established renewable energy practice. We provide audit, tax consulting, capital markets, technical consulting and valuation services to the wind industry. Reznick has also been very involved in the 1603 grant program and has helped a number of wind developers qualify for the program.

Edward W. Zaelke: I am Co-Chair of the Global Project Finance Practice at the law firm of Akin, Gump, Strauss, Hauer & Feld. Our group consists of about 40 lawyers worldwide. About 25 or so focus exclusively

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or almost exclusively on renewable energy. Years ago, I decided to immerse myself in the wind industry, not just the legal issues, but the financial, technology and policy issues as well. This has carried over to our entire group. We believe that, by becoming part of the industry on a broad scale, not just lawyers looking in, we understand our clients’ problems better and can help develop more creative solutions – beyond just legal solutions. Furthermore, through our understanding and knowledge of the market, we are in a better position to “help deals happen” through introduction of our clients and contacts and by becoming involved in the structuring of complicated financial transactions at an early stage.

Trey Goede: Affinity Wind, LLC is a privately held wind energy development company, focused on utility scale projects throughout the Midwest (United States). Affinity formed a joint venture in 2011 with Suzlon Wind Energy for co-development purposes.

PES: And what’s your on-the-ground assessment of the state of the sector at the moment?

Shawn Lamb: Natural gas is cheap right now. We currently have more natural gas than we can use or store and the reduced cost certainly puts natural gas ahead of wind. The average consumer, in the current economic state, is more concerned about how much of their paycheck has to be allocated to electricity than whether that electricity comes from natural gas or wind. The state of the sector is directly impacted by the state of the economy.

I believe that wind energy has three components. One is growth of new projects, one is completion of project in development, and the last is maintenance of the equipment we already have in service. Regardless of whether the PTC is extended or not, there will continue to be a need for maintenance of existing equipment and the projects already approved and in development will continue. That means there are still a lot of job opportunities in the field for our students.

Rocky Sease: There are challenges to be addressed. One is the uncertainty surrounding the extension of the Renewable Electricity Production Tax Credit which expires at the end of 2012. Development has slowed substantially as potential investors and potential wind companies are slow to develop long-term plans due to this financial uncertainty.

Another challenge is getting the power from the wind generation locations to the power grid. The best locations for wind generation – off-shore, mountains, desert – are not where a high need for power exists. Because of the effort, equipment and wires needed to get the power to the grid and to the end user, the price of wind-generated power is higher than that of the traditional fossil-based fuels. And there is the challenge of maintaining a skilled workforce due to the magnitude of retirements predicted in coming years. According to Gridwise Alliance, by 2015, approximately 50 per cent of the engineering workforce and 46 per cent of skilled technician positions will need to be replaced in the energy sector because of retirement or attrition.

Timothy Kemper: I think it’s in a very precarious situation right now. With the expiration of the PTC and ITC at the end of 2012, very few wind projects will be started in 2013. After probably the best year for megawatts ends in 2012, we expect a significant decrease bordering on near standstill during 2013. Even the extension of the credits during a lame duck session after the first Tuesday in November 2012 will not prevent a significant decrease of completed projects in 2013.

Edward W. Zaelke: This has been a very difficult year for the wind energy market in the U.S. In some ways it is more difficult than the slowdowns in 2001 and 2003 when the extension of the PTC was also uncertain. That is because today the domestic wind industry has so many more people who depend upon it for their livelihood. With the exception of those in the construction trades and some of the developers, most of the

industry is at a standstill. There are few, if any, turbine orders being placed, limited M&A activity and very few financings happening. Fortunately, we are seeing that start to change a bit. It appears that, as we get closer to the election, companies are becoming more confident in an outcome that will allow the PTC to be extended. As a result we are seeing M&A activity start to pick up. That is often the first signs of an uptick in the industry.

Trey Goede: These are trying times, make no mistake about it. Specifically in the United States, it is not widely known that the wind industry is on its way to losing half of its work force at a very critical time. Additionally, it is a little known fact that all forms of energy have been and continue to be subsidized, including coal, oil, gas, nuclear, etc. However, the wind energy Production Tax Credit, which has been available since the Energy Policy Act of 1992, is being left to expire at the end of this calendar year-2012.

PES: Politically, wind power is a hot topic right now. Do you believe that there is substance behind the promises for growth?

Vincent DeVito: Recently I was able to participate in two roundtables - one in New York, and the other in Washington, DC. In addition, there was a clear consensus: There is room for growth in all sectors of energy.

Most notably, folks did not view the development of natural gas in the United States as a hindrance to renewable energy development. In fact, it is considered a nice component of domestic energy supply. Domestic supply also address the national security concerns raised by an over reliance on imported energy. While the boom bust cycle of the production tax credits and the investment tax credit is widely documented, it has not been sun-setted in an era when there was so many state and other federal incentives available.

For instance, the federal government is pursuing a report of an environmental

assessment for commercial wind leases and site assessment activities on the Outer Continental Shelf off Rhode Island and Massachusetts. Further, in places like Massachusetts, the states are rolling out a significant increase in net metering opportunities, expanded renewable portfolio standards, and attempts to meet financing gaps by innovative state involvement via public-private partnerships.

Shawn Lamb: I believe growth will continue, but maybe not at the same pace. Currently 29 states have renewable energy standards that commit to replacing fossil fuel energy with renewable energy, and there are more states that will implement standards in the future. The only way to meet those standards is to grow the industry with future projects or expansion of existing ones. You may see a current wind farm grow from 200 turbines to 500 turbines. I also see growth of research and development to make future turbines more efficient with greater output.

Rocky Sease: I hope the substance is there. We need to utilize all forms of energy available to us in order to meet the vision of energy independence for the country.

In the US, according to American Wind Energy Association statistics, wind generation now totals 49,802 MW of cumulative wind capacity through the end of the first half of 2012. There are over 10,300 MW currently under construction spanning 30 states plus Puerto Rico. In addition, many states and the District of Columbia have some type of renewable portfolio standard (RPS) requirements. All of this provides substantial momentum for the development of wind power but, as with any business, financial and regulatory uncertainty results in greater risk for wind power and slowing investment in the sector.

Edward W. Zaelke: I refuse to let a sluggish 2012 change my bullish outlook for the growth of the wind energy industry in the U.S. Thirty years ago, when I decided to make this industry my career, I thought the fundamentals behind developing an energy economy based upon the extensive

development of wind and solar resources were very strong. I may have been a bit ahead of my time with those thoughts. However, the fundamentals underlying the need for renewable energy have gotten even stronger since 1982. For example, we know a lot more about the impact of CO2 on climate change.

Our country has also fought two wars in the Middle East and we continue to lose American lives today. In the end, however, it is going to be the cost of wind energy in relation to other means of producing energy, in addition to the environmental issues, jobs and energy security benefits, that will ultimately drive wind energy to the 20 to 30 per cent penetration level in the U.S. In many areas of the country wind is now cheaper than all other forms of generation, with the exception of natural gas, which is at historic lows. As the economy improves and we continue to see coal plants taken offline as they lose their cost advantage, I expect the growth curve of wind will again pick up.

Trey Goede: Wind energy is extremely relevant—it is not going away. Wind is not THE solution to energy independence, but it certainly is PART of that solution. The “tried and true” three blade design turbines are becoming more efficient and less expensive, through worldwide deployments. As exciting, there are new turbine design manufacturers such as Sheerwind and FloDesign that have the opportunity to become the next generation of wind turbine generators at some point soon.

PES: Do you believe that the industry has a positive attitude towards legislation? What more could be done to encourage this?

Vincent DeVito: As a former regulator at the state and federal levels, I am very aware of the impact an uncertain regulatory environment can have on an industry. Particularly, the wind industry is venerable here because of the added controversy concerning siting. In addition to the plentiful uncertainty concerning federal incentives, wind developers consistently have to deal with complex local protocols. These local

externalities become big internal in terms of construction schedules and financing diligence. There is little for the developer to do except patiently go through the public education and scoping process.

Of which, the outcome is never fully know until the finale determination is made and survives an, at time, exhaustive appeal process. From my experience, the industry as a whole is somewhat suspect of legislation. In fact, I have current clients that are concerning that the federal 1603 program, albeit expired, could close even upon these that have met the begun construction safe harbour date. None of which is good for business. However, organizations such as the Clean Energy Alliance, of which IES is a member, are designed to help the industry and public become better aware and more adept at participating in the market in view of such dynamics.

PES: In your opinion, do the world’s (many) wind associations offer a credible and coherent voice for the industry?

Vincent DeVito: Associations have a significant role in bringing an industry together. They can help folks network. For instance, IES fully functions as a business to business networking center for those interested in the sector and wanting to participate in Central Massachusetts. In fact, both federal and state program offices use the associations to get their message out to the industry and even scope or launch particular programs. IES had worked with the remarkably progressive and effective Massachusetts Clean Energy Center to achieve significant results in greater Worcester.

The purpose of which is to deliver the economic benefits of the technology economy to our region. Mostly, the organizations serve as ideas platforms. As a former government official, they made it easier to locate experts, noodle ideas, and simply develop deeper and meaningful partnerships. Overall, the associations can be tremendously effective in the national and

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state capitol buildings. Member of both parties seek input from associations into their hearings and staff are very adept at going back to the best and brightest. It can be highly effective to invest in associations, such as the Clean Energy Alliance.

Shawn Lamb: I don't have much experience with the European Wind Energy Association, but I do know that the American Wind Energy Association (AWEA) has been an amazing voice for our entire industry. AWEA has really taken the reins on promoting wind energy. It is important that the United States get behind renewable energy.

Timothy Kemper: Credible, yes, coherent, not as much. I do believe the industry has differing agendas from the various participants which creates confusion in the marketplace. What may be good for the manufacturers may not be good for IPPs. What is beneficial for the utilities may not be beneficial for the capital providers. It is natural to have differing agendas but it is confusing. Hopefully, the common goal of expanding the industry will create cooperation among the participants and no single stakeholder will drown out the rest.

PES: What impact has the uncertainty surrounding the extension of the Production Tax Credit (PTC) had upon the industry?

Shawn Lamb: The uncertainty of the Production Tax Credit's extension has caused many investors to wait, and hold on to their money. Since this lack of "new orders" has already cut into projected sales in 2013, many of the OEMs (Vestas, Suzlon, etc.) have scaled back production. This also affects the component manufacturers that feed these factories.

Another important impact is that there are very few new projects on the books. This means fewer promotions within the service and operations side of the wind industry. For an industry that has seen massive growth in short periods, this almost seems like a contraction. Though they are not de-commissioning wind turbines, a lack of new

turbines indicates a lack of expansion and promotion for technicians.

Rocky Sease: Probably the biggest impact is the uncertainty injected into development projects in the sector. Investors are nervous as financial and regulatory uncertainty makes it more difficult to determine the value of an investment in wind power. Historically, in years when the tax credit was allowed to expire – 2000, 2002 and 2004 – new installations decreased, and we're already seeing that trend for 2013.

Unfortunately, that translates into lost jobs in both the sector and the manufacturing industry that supports wind power, and layoffs are already being announced. The presidential election is having an impact on Congress's ability to act, so it is important to get through the election. A recent article at Bloomberg.com suggested that Congress develop a plan for phasing out the tax credit particularly since the wind sector is expected to eventually stand on its own.

Edward W. Zaelke: The Production Tax Credit has now been in existence for 20 years. By any measure, it has been an incredibly successful policy. Over those 20 years I am guessing that the PTC may have reduced taxes on wind energy production by \$20 to \$30 billion. However, the taxes collected on other profits, manufacturing, employee wages, and land payments to farmers exceed that amount by a large margin. In addition it has taken an industry that was in its infancy and built it into a \$20 billion per year piece of our economy with over 75,000 direct jobs in manufacturing and construction and probably 125,000 or so jobs when the indirect jobs are considered. That doesn't even consider the benefits to family farms from royalty payments. The real benefit from the PTC, however, has come in the past 5 years or so. Given the success of the PTC, the industry began to believe that Congress would continue to renew it every couple of years, as Congress does with many tax credits. This caused an increase in investment in domestic production and research. As a result, the cost of producing a

kilowatt hour of wind is down 50 per cent in some areas over what it was 5 years ago. The uncertainty created by this Congress over the PTC has dampened the momentum the industry has been experiencing and it will take some time to find that again.

Trey Goede: I have worked in several regulated industries throughout my career, the last five being CEO of Affinity Wind in the energy space. I can honestly say that I have never been more discouraged by lawmakers and general politics related to the expiration of the Production Tax Credit. The short term extensions of this credit are problematic enough, but there is no reason why the PTC should not have been re-enacted with the Transportation or Tax Bills earlier this year.

There is bipartisan support, and it should have been figured out. Energy clearly represents one of the most important industries for the foreseeable future worldwide, and the United States has taken a huge step backwards tied to this inaction. Sure the problem has affected my smaller wind energy development company, but it is much more far reaching and larger than just Affinity Wind.

Larger developers have cancelled or postponed all 2013 projects and beyond, and some industry experts are forecasting a 90 per cent reduction in new wind developments next year compared to record installations in 2012. As a result, the many turbine manufacturers that have committed to the US market over the past five to seven years are reeling with oversupply and NO demand, so facilities are being shuttered and employees laid off. There are 5,000+ components in the nacelle of a wind turbine. In 2005, less than five per cent of those 5,000+ components were manufactured in the United States.

Last year, over 60 per cent of those components WERE manufactured in the United States, with many companies targeting wind as a way to help offset current economic conditions. These companies stopped receiving orders as well over the last 10 months, again resulting in layoffs and

shuttered facilities. Think of how many specialty manufacturers have to be affected.

Lastly, I read the other day that the effects on wind energy research and development is not expected to be known immediately, but without federal policy support, I think it is clear that we will lose any competitive advantages to our foreign competition, specifically China. Company budgets for R&D and general government research support will not be made available. China has already surpassed the United States in every major ranking and indicator over the past two years. It is just unfathomable that this is being allowed to happen due to an election year, general politics, whatever!

We are living in what is widely regarded as a recession, so why are we allowing wind energy job loss, and as important the loss of billions of dollars worth of direct and indirect benefit that comes from new wind development? Cancelling the availability of tax credits tied to those billions of dollars worth of investment and job creation? It just does not make sense.

PES: Has your organization been affected by the wider economic situation in North America? What challenges have you faced?

Shawn Lamb: One of our goals is to place every student into a job within their field of study, at a good rate of pay, so they can support themselves and their families and pay their bills. While we are currently seeing a good placement rate, the hourly rates for some jobs is not always what we hoped it would be. The high unemployment rate makes it easier for employers to pay lower rates with fewer benefits. Fortunately, our graduates are entering the workforce with much needed skills.

We had one company hire seven of our first wind graduates. We were informed that all of those students are being promoted to the next technical level six months ahead of the normal promotion schedule. That says a lot about the calibre of student we are putting into the field and the skills they leave Ecotech with.

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Rocky Sease: We are fortunate in that our business is somewhat resistant to economic fluctuations. It's not that we are unaffected – our growth has been slower than expected since the recession – but our core business is related to NERC regulations, so much of what we do is mandated to the electric energy industry.

Of course, when the economy gets tight, clients look for ways to do things as inexpensively as possible. Utilities are less likely to outsource as much of their training and compliance consulting needs, so we find ourselves in a much tighter competitive situation. However, it is difficult for individual utilities to staff with the level of expertise that we bring to the table. So while we are not as sensitive to the economy as some sectors are, we are certainly not immune to it.

Trey Goede: Energy demand has been much lower in the past 3 years, directly a result of economic conditions. With that comes lower energy prices as demonstrated by \$2 natural gas. Lower wholesale power prices have forced the wind industry to sharpen its pencil, and by my account, it has done a very good job. At Affinity Wind, our overall "cost of wind power" or the price available to wholesale offtake companies, decreased substantially over the last three years, but not quite enough to match the general wholesale power price dip from existing coal plants or natural gas. If I were a utility with any sort of a renewable or sustainable energy plan, I would have been a long term buyer of wind energy for the last two years because some folks think the price for wind will be going up. It certainly will increase if the PTC does not get extended, so a long term price lock ahead of that time seems like a very good plan.

PES: Do you believe it's true that the financial markets are so weak that it's almost impossible to raise the necessary funding for growth? Or is wind power 'weathering the storm'?

Shawn Lamb: I think larger companies who deal in wind are weathering the storm. Their financial situation doesn't ride fully on the

wind market and they have more latitude than smaller companies whose sole business is wind. There may be smaller companies who are bought out by larger corporations.

Growth is relative to how big you already are. If a company depends largely on incentives and subsidies to stabilize their financial situation, that company will struggle to grow, and may even fold, when those incentives go away. It seems that smaller companies are the ones who rely heavily on incentives to survive. They may have put "all their eggs in one basket" so to speak and haven't necessarily focused on building a business model to eliminate the need for incentives. A larger company, with more diverse products, can "weather the storm" when the market goes softer in an area.

Timothy Kemper: From a perspective of raising capital for wind energy projects, 2012 may end up being the best year ever. There has been an abundance of both traditional bank financing as well as tax equity and private equity financing for projects. 2013 will be extremely challenging and we are starting to see the effects of a gradual shutdown as capital is moving out of the market into other renewable technologies. Clearly, with the benefit of strong PPAs supporting projects being built in 2012, any good project found financing and at very attractive rates. But as good as 2012 was, 2013 will be especially challenging. Not only are PPA prices exceptionally low but the expiration of the credits will remove a needed subsidy that competes against conventional energy sources.

Edward W. Zaelke: Except for the period of the year or so after start of the U.S. financial crisis starting in late 2008, I don't think the wind industry has suffered from a shortage of available debt or equity for good projects. What is clear is that the availability of debt from most European banks, which in the past have been willing to take some risk for a better return, is gone. Going forward, projects are likely to require more equity, with the debt that is available broken into

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two pieces. There will be a very “safe” piece held by banks and institutional investors looking for a safe yield. In some cases there will also be a second piece held by a set of mezzanine lenders who may take more risk to fill small gaps in available equity. Tax equity will continue in relatively short supply. It will remain a significant cost for those developer or owners who cannot use the tax benefits themselves. Project equity continues to be a challenge. It may be filled to some degree by private equity funds who sponsor some of the larger independent developers. Private equity needed to support the smaller developers continues to be a difficult need to fill.

Trey Goede: If you have a solid project, with a bankable power purchase agreement, financing is available. The bigger problem over the past two years has been securing a power purchase agreement. There were not enough utilities ready to enter into long term offtake agreements in my opinion given inexpensive “brown” power prices, and there is a very good chance that this disconnect will be felt by those same utilities in the near term. Many states have renewable portfolio standards requiring utilities to purchase clean energy, and most utilities have their own sustainable plans going forward in some capacity. The bottom line is that wind energy pricing has a very real chance of being higher next year, and beyond, especially if the PTC is not extended. The last two years represented historically the lowest wind energy prices, and the smart players in my opinion locked in that pricing for 20+ year terms.

PES: What are the most common H&S considerations faced by the wind sector?

Trey Goede: Despite the growth of the industry, planning is an increasing problem for farm operators. What can be done to address this problem? The biggest challenge related to planning is the “start and stop” mentality regarding federal support for wind. In the US, the short term PTC extensions of one to three years do not foster the ability for long term planning. For example, it is now September, and no PTC extension will even

be considered until after the election. Wind energy is not something you can turn off and on like a hose. There are supply chain, lead time, permit, workforce, etc constraints that all need to be re-established or propped back up, and these things take time. In my opinion, we have lost 18-24 months of recent industry growth as a result of imminent PTC expiration.

PES: You are able to change one piece of legislation (relating to your corner of the wind industry) tomorrow. Which would it be, and why?

Shawn Lamb: If I could change one piece of legislation it would be to enact a mandated Renewable Energy Standard in every state. This would force each state to look at its own resources and make adjustments. Nevada would probably opt for solar, whereas Minnesota would opt for Wind. I think a RES of 20 per cent - 25 per cent is perfectly reasonable within the next 15 years.

Timothy Kemper: Permanent extension of the PTC AND ITC. Certainty of legislative support along with extension of a crucial subsidy would bring capital back into the marketplace. A national renewable energy standard would be nice but based on the track record, the ITC/PTC really drives capital into the marketplace. Clearly, the majority of the country supports clean, renewable energy. The US system of subsidizing favorable industries with tax credits is a longstanding practice. Given a permanent extension of the credits, tax equity would consistently flow into the marketplace and drive development costs down. This would ensure the long term viability of the industry including the manufacturing participants.

PES: Would you say that the industry has finally become a career destination for young people – or are we still recruiting mature employees from mature sectors?

Shawn Lamb: The mature sectors are still beating the young folks out. Companies are hiring the best candidate and often they look for experience, reliability, and

professionalism. Military backgrounds are a good fit for many of the technical skills companies are looking for in their hiring searches.

The student demographic at our school leans more toward the mature side as well. The average age of our students is currently 31. We have a large veteran contingent and quite a few of our students come in with four-year degrees. We are considered a destination school and a large percentage of our students come from all over the United States, Puerto Rico, and elsewhere. However, we are seeing more students coming in out of high school. As young people look at the job market and the state of the environment, they see an opportunity to not only gain skills that can get them a job, but the ability to make a difference.

Rocky Sease: Early on, when wind projects were first put into place, there was an effort to bring in skilled utility workers because their level of experience and ability enabled them to quickly get projects up and running. Now, as the sector has gotten more established and procedures have been put into place, the sector is more likely to hire younger, less experienced workers.

Younger workers tend to be more open to opportunities presented by alternate energies such as wind. As happened previously when power marketing organizations were being established in the mid-to late-90s, the newer workers with less experience are often better able to develop revolutionary systems and processes that help the industry continue its forward progress. I think the industry is exciting – it’s just a matter of finding younger people who see the excitement in our industry.

Timothy Kemper: The industry has become a magnet for younger talent. From colleges offering degrees in wind technology to the need to provide affordable renewable energy for future generations, the wind industry has become a prime career destination for the younger generation. Today’s college students are very conscious of the environment and want to be sure that we continue to protect it for future generations.

This leads to a very strong interest in the wind industry. For our firm, the opportunity to do work on behalf of the renewable energy industry is one of its biggest attractions to college graduates.

Edward W. Zaelke: I speak often about the wind industry to law students and other people just starting their careers. I tell them that I have the best job in the world. I am doing challenging work in a new and changing area and the end result is a product that, over time, will improve the lives of all Americans and other people around the world. In what other industry can you find this? Yes, as the industry has grown, it now has to fight with fossil fuel and other industries for a share of the country’s energy mix. However, if we can ever reach a point where we look 10 or 20 years ahead in making policies, rather than continuing to think short term, the need for this industry and the changes it will have on our country are very clear. Being part of that change is both challenging and exciting. Young people are listening. For several years now, we have been attracting some of the best and the brightest to all segments of our industry. I expect that to continue for years to come.

Trey Goede: I also teach entrepreneurship at Saint Louis University as an Adjunct professor, so the success of our young people is near and dear to my heart. In 2009, only two people in my business school class of 29 had jobs heading into graduation. I want all my students to have jobs or the means to start a career someplace! Times are tough, and up until recently the wind industry was creating jobs. There are a lot of mature employees available in this down economy, so those people can help fill gaps of course. However, I am truly impressed with the number of universities nationwide that quickly established curriculum to address this demand over the past five to seven years for cleantech/renewable jobs. The PTC expiration will of course affect these universities, and more importantly the students graduating from these programs. I used to see thousands of wind energy jobs listed in the market, and today it is being described as “dead”.

PES: Does wind technology research get enough funding?

Shawn Lamb: After visiting the National Renewable Energy Laboratory’s National Wind Technology Center, and getting an inside tour, I can say that there are many exciting things happening around R&D. I have also seen the emerging technologies coming out of Nordex and GE. I think that the DOE / NREL budget should be increased. Not for political reasons, but out of necessity for an alternative energy source that we will need going forward. The fact is that we are facing an energy crisis within the next 20 years. It is important that we use the last “cheap and easy” energy sources (such as oil and natural gas) to develop the next generation of energy infrastructure. This infrastructure will be renewable, and a prime component will be Wind Energy.

PES: Where are the skills gaps in our sector right now?

Shawn Lamb: Since we primarily train Wind Techs and Commissioners, it is important for them to understand power electronics, schematics, subsystems (such as pitch and converters), but most importantly, be able to troubleshoot complicated systems. We also emphasize soft skills such as professionalism, leadership, ownership, and pride in work.

All of our degree programs at Ecotech have a solid foundation of electrical knowledge and hands-on training because of industry feedback that electrical training for industrial and energy applications was a big gap. That gap in electrical skills is true for all areas of manufacturing as well as the power industry. We have had companies tell us that basic knowledge of hand tools and how to use them, how to read blue prints and electrical schematics, and cranes and rigging are a few other skills that they have a hard time filling.

Rocky Sease: The biggest challenge we see to employers in this sector and even the energy industry in general is that for all the good work educational institutions do, graduates coming into the power industry

“I am truly impressed with the number of universities nationwide that quickly established curriculum to address this demand over the past five to seven years for cleantech/renewable jobs”

Trey Goede, Chief Executive Officer, Affinity Wind, LLC

need additional training. There is still a transition that must occur for them to go from a recent grad to a contributing employee. The other side of that challenge is that many of the current employees in the industry are rapidly reaching retirement age.

According to Gridwise Alliance, by 2015, approximately 50 per cent of the engineering workforce and 46 per cent of skilled technician positions will need to be replaced because of retirement or attrition. Compare that to our adult learning information that predicts it takes 10 years to become an expert in any field of endeavor and you can see the challenges facing the industry. We don’t have the luxury of waiting on the expertise level – we have to find a way to shorten the gap. That concern is a key initiative for our company as we continue to improve our training programs.

PES: What do you think is the greatest challenge, or set of challenges, facing our industry today? Why do you think these issues are so important?

Rocky Sease: I see two significant challenges facing the sector today. The first is the financial challenges that must be resolved. The sector must find a way to reduce the cost of a megawatt of power in order to be competitive with other forms of energy.

The second challenge is the regulatory uncertainty surrounding the sector. Not only are we missing a coherent national energy policy, the companies face different regulations from different levels of government. City, state and federal governments provide different regulatory directions with states and cities varying on an individual basis.

California is one of the states leading the way in legislating the amount of renewable energy its utilities must generate, but not all states are following their lead. Now that the cost of natural gas has bottomed out, some cities that previously supported wind energy projects are backing off from that support and asking public utility commissions to shut down projects. There is still a “not-in-my-

backyard“ mentality as people support alternate energy in theory, but don't want to see the generation structures on their horizon.

Timothy Kemper: Clearly, the rapidly decreasing cost of natural gas has put a freeze on reasonable PPA prices - and that is good for the consumer. I think the requirement to have the same leveled cost of energy as traditional sources is unrealistic. Conventional sources have been subsidized for decades allowing their costs to decrease over time. The country needs a broad array of energy sources. Too much dependence on one source can have unforeseen consequences; Japan's energy challenges after the tsunami-related nuclear tragedy is a case in point.

Also, the industry needs to address the need for an efficient battery storage solution in order to provide for a constant stream of electricity. Being able to provide uninterrupted affordable energy 24 hours a day needs to be a goal. Transmission needs to be improved as well, enabling low cost production to be able to be delivered efficiently to higher cost markets.

Edward W. Zaelke: The wind industry faces many very real and important challenges, so it is hard to focus on just one. However, the challenge that we have faced the longest is the lack of a true long term federal energy policy/ More importantly, a policy that gets us off of this two year cycle of the PTC and properly designs an energy mix for the country that helps create a long term clean and sustainable energy future for generations to come. There are a number of separate economic interests that are pulling and tugging at what that policy might be and, frankly, many interests that are quite satisfied with the status quo. I think that the status quo of an energy-non policy has already taken us down a path of irresponsibility to both our current population and future generations. Our greatest challenge as an industry may be finding and supporting the leadership the country needs in order to balance and, in some cases over-come, the various interests and secure the country's energy future.

PES: One of the conundrums of wind energy is that the wind doesn't blow constantly. Are we doing enough to help balance shifting power production?

Rocky Sease: Fortunately, there is a lot being done with the technology we currently have to help balance production. For instance, combining wind generation with hydro generation is a good way to smooth out the production peaks and valleys associated with a variable resource like wind. Water acts as a storage resource allowing a steadier stream of wind power. There is also a lot of research being done around different types of storage including compressed air and batteries to see if we can store energy in large enough quantities to be useful. These capabilities are still evolving, so we don't know the answer yet.

The other way we can help balance the production is through policies such as the recent FERC proposal to reform its rules for integrating the rapid growth of variable energy resources into the bulk electric system. According to a recent press release, the proposed rule would “reform the Open Access Transformation Tariffs (OATT) and the Large Generator Interconnection Agreements file by public utility transmission providers to require them to offer services that will allow for a more efficient integration of variable energy resources.”

PES: We're interested in the role of ancillary businesses (such as logistics, etc.) and how they impact upon the wind industry. Do you feel they could do more to drive future growth?

Timothy Kemper: Clearly, any time you make the logistics more efficient, it will positively impact the business. Production and delivery being closely integrated has driven costs down recently. The closer the supply chain and development chain are tied together, the more efficiencies you can drive. ■

PES would like to thank all our roundtable contributors. For more information, please visit their respective websites.

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Opinion formers and idealists wanted!

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