

# MAINTENANCE

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## FIRST IMPRESSIONS: FIELDING THE QUESTIONS OF INCOMING WET TRAINEES

Career-oriented colleges focused on preparing students for wind energy technician careers have not existed for very long. In fact, the public perception of our industry is that wind turbines have only been around for the past few years. Although we in the industry are well aware of the long history that has brought us to this point of monstrous growth worldwide, this dissonance between public perception and reality results in some entertaining, and sometimes very astute, questions from prospective students who tour Ecotech Institute in Aurora, Colorado.

Some of the more common questions include inquiries about technician pay, working conditions, geographic distribution of job opportunities, required skills and background to land a job, and upward career mobility prospects for an entering technician. Unfortunately, nobody can provide fair, concrete answers to such questions. If you ask ten different experienced technicians to answer these questions, you often will get wildly conflicting answers.

Ecotech Institute instructors are subject matter experts in their various renewable energy fields (wind, solar, power utilities, energy efficiency, renewable energy business), so some of the more unusual questions get passed along to the faculty to answer. Some of the more memorable wind turbine questions follow:

“I saw a YouTube video of guys BASE jumping from turbines. Will I get to do that?”

“How often do turbines blow up like the video I’ve seen?”

“How fast do those things have to spin to cool the earth?”

“Do wind turbines rotate the other direction in the Southern Hemisphere?”

“Are the transmissions in wind turbines stick-shift or automatic?”

“Why don’t they install solar panels on the blades and make even more power?”

Answering questions like these without offending prospective students takes tact and skill. We certainly want to foster their sense of curiosity in our industry, but at the same time, we can steer them towards reality with a short discussion of the practical application of wind energy.

For every prospective student who knows very little about wind turbines, we have others who have been watching the development of the industry and, more specifically, the development of wind turbine designs. It is very refreshing to field technical questions that delve into aerodynamics, power electronics, or best practices in O&M and safety. In fact, we occasionally enroll a student who has a background as a U.S. Navy nuclear technician or mechanical engineer who is looking to try something new. One of the more impressive questions follows:

“I’ve read a bit about three-phase induction generators. Are they typically paired with a full-scale frequency convertor, or do they use a 4-quadrant frequency convertor with insulated gate bipolar transistors?”

Admittedly, this question has not



By Walter Christmas  
Ecotech Institute

come up more than the once... and it’s possible the prospective student was hiding a cue card. However, it demonstrates the wide range in knowledge and background of students enrolling into programs like the ones at Ecotech Institute.

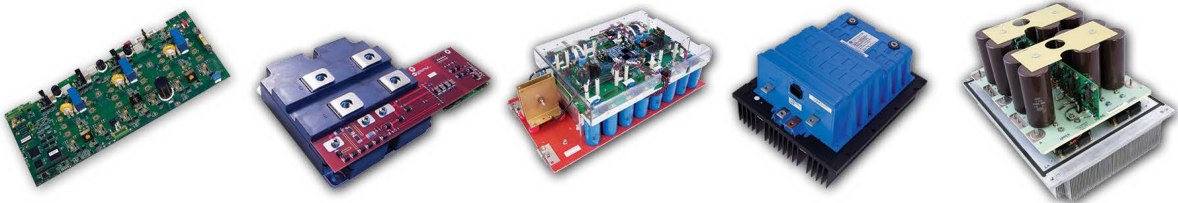
The most common question prospective students ask about wind technician careers is about how much money they will make. The wide range of experience they bring to the program is part of the reason that graduating students cannot be guaranteed a specific starting income. We would love to tell every incoming student that they will be offered \$80,000 jobs within a month of graduating, but that would be unrealistic. There are just too many variables to consider, not the least of which may be luck.

Some graduates may be offered travelling positions as turbine commissioners with overtime schedules that can easily help them surpass six figures in their first year. Some grad-

uates will enjoy comparing multiple job offers, a thrill they may never have experienced in their lives until that moment. Yet, many graduates will work hard in their job search to land the job that will merely get their foot in the door. Where they take their career from there will depend on their safety awareness, work ethic, trainability, and to a certain degree, their social skills. Ecotech Institute's career placement professionals will always be available for support and networking when needed, but most graduates find that with the education they've attained and the experience they gain in just a few months on the job, the challenge they face in their career is no longer one of finding work. The challenge instead becomes one of choosing the best option amongst many career path opportunities as recruiters begin contacting them for a change. ✎



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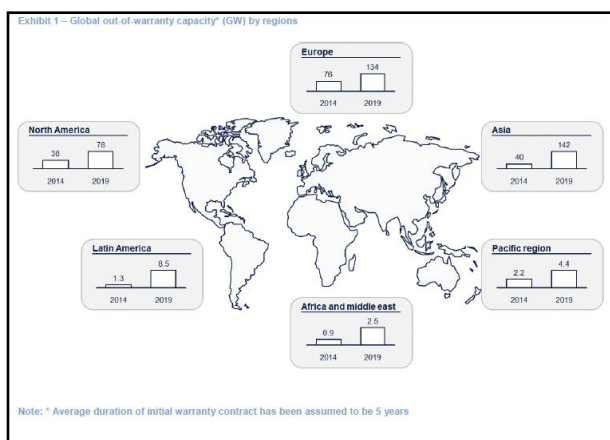
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## MAINTENANCE

### EXPANDING WIND SERVICES MARKET OPENS DOORS FOR PE GROWTH

By Sidharth Jain and Rahul Kapoor  
MEC Intelligence

*Since 2006-07, new wind markets have emerged in Eastern Europe due to high potential and favorable policy scenario. These markets, nearly 10 in number, collectively represent significant opportunity for private equity investments.*



#### MARKET FOR WIND SERVICES IS GROWING CONTINUOUSLY

Wind industry has grown more than 20 times in past two decades with installations reaching nearly 370 GW in 2014 from only 17.4 GW in 2000. This tremendous growth in installations has in turn created a huge market for wind farm maintenance services. Traditionally, turbines are serviced under warranty contract by turbine OEMs for a few initial years. Assuming a standard five year warranty period, around 160 GW of the global wind capacity is expected to be

out of warranty in 2014. Further, more than 40 GW capacity is expected to come out of warranty every year towards 2020.

#### TURBINE OEMS LEAD THE SERVICES MARKET, BUT ISPS ARE GETTING PREFERENCE

The turbine service market has traditionally been dominated by turbine OEMs, mainly due to their warranty period and technical knowledge. However, as the market is maturing and fleet is coming out of warranty, many localized independent service provider (ISPs) have emerged into the





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market, who offer a cost effective alternative to turbine OEMs. They are either specialized service providers or component OEMs. The success of ISPs, especially in mature and open markets like USA, Spain and Germany is visible from their revenue growth in recent years. For example, Deutsche Windtechnik, a Germany based ISP has seen a growth of approximately 32 percent in past

five years with revenue reaching nearly 70 million Euro in 2014.

### **FIRST ROUND OF PE INVESTMENT IN ISPs PROVEN EFFECTIVE**

This growing market has already seen PE investments in several large ISPs of Denmark, Germany and USA

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since 2008. For example, Parcom Deutsche Private Equity, subsidiary of ING bank, acquired majority share in Availon in 2008. In 2010, Upwind raised ~27.2 million Euro from Kleiner Perkins Caufield & Byers and Mission Capital Group. Polaris Private Equity, in 2012, acquired majority stake in Connected Wind Services. The investments have proven to be effective as revenues of Availon and Connected Wind Services have nearly doubled since investments.

#### **EASTERN EUROPE EXPECTED TO EMERGE AS THE NEXT FRONTIER FOR PE INVESTMENTS**

Since 2006-07, new wind markets have emerged in Eastern Europe due to high potential and favorable policy scenario.

These markets, nearly 10 in number, have collectively added approximately 8.2 GW since 2006. Nearly 80 percent of this capacity is concentrated in Poland and Romania. The growth trend is expected to continue in coming years, for example, installed capacity in Poland alone is expected to reach 6.6 GW by 2020 (Poland's National Renewable Energy Action Plan).

To tap this opportunity from services, new ISPs are expected to emerge, as was the case in mature markets like USA and Spain where the number of ISPs increased as the installed base grew. Also, ISPs from established markets like Germany and Spain are moving into nascent Polish and Romanian markets. For example, Deutsche Windtechnik entered Polish market around 2014 and has been successful in getting maintenance contracts from players like RWE (197 MW in Poland). Availon, another leading ISP in Europe, is also present in these emerging markets.

#### **GROWTH COMPANIES WILL BE ATTRACTIVE FOR PE FIRMS, BUT WHO ARE THESE GROWTH COMPANIES?**

No doubt that the growing service market will drive the growth of wind service providers, however, this 'growth' must be carefully assessed by PE firms in the screening process itself to identify the targets. Gazelle companies may not necessarily be the ones who will grow in future. In recent years, the landscape of wind services has been shifting from low value, labor based services towards high value, asset optimization services.

In addition to this, services like component remanufacturing, up-tower repairs and data based performance optimization are increasingly becoming of high value to the asset owners. Hence, in order to grow an ISP must have additional attributes in addition to growing revenue and strong customer base. For more information, visit [www.mecintelligence.com](http://www.mecintelligence.com). ✈



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The world's largest investor-owned utility is now bringing customized asset management, maintenance, and repair services to North American renewable energy projects. E.ON, one of the largest U.S. renewable energy generators, announced that it is forming E.ON Energy Services to capture a growing and under-served market. The new business will leverage E.ON's global experience, turning that experience to its U.S. customer's advantage by driving more efficient and profitable renewable energy project performance.

"As we transitioned to an operations-focused company several years ago, we saw a large, growing demand for qualified service providers. Supporting project owners and investors to get more performance, efficiency, and revenues from their projects is at the core of E.ON Energy Services. We'll leverage nearly a decade of experience to offer a one-stop shop to small, mid-size, and big customers alike," said E.ON's North American chairman Patrick Woodson. "We can help customers drive project performance by providing dedicated service with an 'Owner's Eye'."

E.ON brings considerable assets to project-optimizing services, including:

- More than \$5 billion dollars invested in North America;
- Nearly 3,000 megawatts of North American generation capacity owned, operated, or maintained by the company;
- Millions of dollars in reductions in E.ON's own operating costs;
- More than 1,800 wind turbines; and
- A 24/7 scheduling and dispatch center with experience in multiple RTO/ISO territories.

E.ON sees its ability to customize asset management services as key to service the fast-growing wind and solar markets.



“For more passive owners, we can perform site and Balance of Plant (BOP) management during warranty periods all the way to full asset management services. For more active owners, we can supplement current efforts on major repairs, inspections, or long-term maintenance to keep infrastructure investment costs down,” said Woodson.

The wind and solar markets continue to expand greatly in North America but there are relatively few nationally active service providers. E.ON Energy Services will provide project owners and investors with services that can:

- Protect equipment through simple maintenance techniques that dramatically improve operating conditions;
- Save costs by retrofitting equipment when that is a more cost-effective alternative to expensive replacements;



- Innovate technology by working with parts vendors and manufacturers on design fixes; and
- Improve safety with pro-active solutions that can lower on-site operating risks.

“This is another example of how a robust wind and solar industry continues to create more American jobs and business investment here at home,” said Woodson.

The new venture will be headed by Keith Day who joins the company as president. Day most recently has been a regional vice president of Operations for E.ON. Prior to joining E.ON in 2010, Day had stints at General Electric, Hewlett-Packard, and Magnum Corporation.

Additionally, Guy Dees will be vice president of Operations, Michael Cossentine will head Sales and Marketing, and John Franklin, current head of E.ON North America Operations, will be a senior advisor. For more information, visit [www.eonenergyservicesna.com](http://www.eonenergyservicesna.com).

— Source: E.ON Energy Services

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