

A WORD ABOUT WIND 

TOP 100 POWER PEOPLE 2017

Our guide to wind's most influential people



Featuring interviews with E.On's Anja-Isabel Dotzenrath,
BlackRock's David Giordano, and Jens Tommerup from MHI Vestas

In association with  SentientScience

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Talking turbines:

Jens Tommerup from MHI Vestas talks about where offshore goes after 9.5MW machines

EDITORIAL



By **Richard Heap**
Editor, A Word About Wind

He rarely speaks to the media. He doesn't have a long track record in wind. And yet we have named him the most influential person in the industry today. Who and why?

The answer is Philip Anschutz, the 77-year-old tycoon with an estimated wealth of \$12bn from sectors including entertainment, oil, rail and real estate. There is no doubting his business chops – and so, in April, when he started building a 3GW project that could be the largest onshore wind farm in North America, people took notice.

The project comes at a vital time. The US wind industry has shown its resilience with strong growth despite the election 12 months ago of wind-hating billionaire Donald Trump as president. This explains the number of US investors near the top of our sixth-annual Top 100 Power People report, in association with Sentient Science.

Anschutz has also said, in the couple of interviews he has given this year, that energy is on the cusp of a renewables-led revolution where wind will be key. It is a vital contribution to the debate on whether wind makes financial sense.

And this is why we argue that Anschutz is so important. President Trump has not yet taken an axe to the wind sector. There are good reasons to think he will



Trump is unpredictable, so it must be good to have other very wealthy individuals making the case for this industry.



not: thousands of jobs in his Republican heartlands depend on wind. But Trump is unpredictable, and so it must be good to have other very wealthy individuals making the case for this industry.

Anschutz looks to get into sectors that are on the cusp of major change. The fact he is building what could be the largest wind farm in arguably the most exciting wind market on the planet is hugely significant. More on page 35.

And what else is in this report? Well, we have four big interviews that reflect the range of firms in our final top 100.

First, we spoke to our cover interviewee Anja-Isabel Dotzenrath, CEO of utility E.On Climate & Renewables, about the firm's strategy and key tech trends.

Second, we sat down in London with Jens Tommerup, CEO of MHI Vestas. He talks about its 9.5MW turbines, and how bigger may not always be better.

Third, we talked with David Giordano, from BlackRock in New York, who runs a \$1.65bn fund that reached its final close in July. We got his view on the US.

And finally, we spoke to Ward Thomas, president & CEO of Top 100 headline sponsor Sentient Science, about how materials science can drive down costs. Huge thanks to Ward and his team for sponsoring this Top 100, which is our strongest yet – and with a controversial number one. Thanks for reading! ■

A WORD ABOUT WIND

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E.On Climate & Renewables

THANKS TO ALL OUR MEMBERS

On behalf of the team at A Word About Wind, I want to thank all our members for your support in the last 12 months.

We feel lucky to work in a fast-moving sector where people are helping to fix some of the world's biggest challenges, and making money in the process. And it has been great to see healthy growth in our community in 2017. This means we can invest more in our analysis and events in 2018, and host regular events in North America for the first time.

If you are not part of the A Word About Wind community, we would love to talk to you about the benefits of membership. You can see your options here: www.awordaboutwind.com/subscribe

Our most popular packages are:

Silver Membership
1 user, 12 months - £595

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5 users, 12 months - £1,195

We want to help grow your business, and help to propel this sector to more success in the next 12 months. ■

If you enjoy the Top 100 and would like to buy print copies, please get in touch with one of our team.

THE EXPERTS

To help select the Top 100, each year we bring together a senior advisory panel to provide an outside perspective

Fintan Whelan

Independent Investor



Fintan has worked in the sustainability business since 2000, when he joined Irish energy firm Airtricity. He spent eight years as corporate finance manager and raised more than €1bn of project and corporate debt.

In 2008, he co-founded Mainstream Renewable Power, where he worked as corporate finance director. Key successes included working directly with Japan's Marubeni Corporation, which led them to make an equity commitment of €100m for 25% of Mainstream in 2013. He left in 2014.

Fintan now works with early- and growth-stage renewables firms on business model development and execution plans leading to raising capital. These include Emerging Markets Power, a wind developer in sub-Saharan Africa; SolarCool Ireland, which supplies solar panels for air conditioning/refrigeration systems; and Digital Array Control Systems.

Per Hornung Pedersen

Senior Adviser
Renewables Funds



Per spent 20 years in various managerial positions at companies in a range of sectors before entering wind in 2000, as CFO at NEG Micon/Vestas. He moved to Indian manufacturer Suzlon in 2004, where he was responsible for international operations.

He then took over at REpower (now Senvion) in 2007 and, in his role as CEO, doubled turnover to €1.3bn. Per left REpower in 2011 and, since then, has been active on a number of supervisory boards as well as acting as industry adviser to a number of private equity funds and other companies.

Per is chairman of the board of German listed developer PNE Wind, and independent director of Suzlon in India and SeaTower AS in Norway. He is also senior adviser to MCF Corporate Finance in Hamburg, senior adviser to Atrium Partners in Copenhagen, and senior adviser to cleantech advisory Apricum.

Tom Kiernan

Chief Executive
AWEA



Tom joined the American Wind Energy Association as chief executive in 2013. AWEA is a trade body that represents firms in the US wind industry, and Tom joined our judging panel in 2016 to give his perspective on the biggest names in the North American market.

Before AWEA, Tom spent 15 years as president of the National Parks Conservation Association; and has been deputy assistant administrator of the US Environmental Protection Agency's Office of Air & Radiation, where he assisted in leading the implementation of the 1990 Clean Air Act Amendments. He has also been president of the Audubon Society of New Hampshire; and a senior consultant at Arthur Andersen & Co.

Tom is from Arlington, Virginia. He has an undergraduate degree from Dartmouth College in Environmental Computer Modeling; and an MBA from Stanford's Graduate School of Business.

THE RANKING PROCESS

To make the rankings in the Top 100 as credible as possible, and to reduce the level of editorial subjectivity in the process, we took the following steps

2 January

Started accepting industry nominations.

15 June

Started promotion to attract a wide range of nominations.

11 July

Started desk-based research after publishing Q3 Finance Quarterly.

11 August

Closed to nominations and finalised shortlist.

21 August

Sent shortlist to judges for feedback and rankings.

6 October

Made final cuts and started ranking. The positions and views in this report are those of our editorial staff, and not necessarily those of the judging panel or our headline sponsor. Our decisions are final.

16 October

Finalised rankings and started report production.

9 November

Gave early copies to attendees at our annual conference.

14 November: Top 100 published.

We have made every effort to be comprehensive, and to ensure that profiles are accurate and up-to-date at the time of publication. However, if there are important factual inaccuracies that you feel need correction, please get in touch with Richard at editorial@awordaboutwind.com

A WORD ABOUT WIND'S INDUSTRY SPECIALISTS



Richard Heap

Editor

A Word About Wind

Richard has spent 12 years in business journalism. He started at award-winning magazine Property Week before joining Sunday Times Fast Track in 2011. Richard became editor of A Word About Wind in early 2014 to manage newsletters and reports, and host events. Since then, he has led high-profile initiatives including the Women's Power List and Legal Power List; and has interviewed leading wind players on six continents.



Ilaria Valtimora

Analyst

A Word About Wind

Ilaria started her career working for large Italian banks. After moving to the UK, she spent three years at forex broker Fidelis, where she analysed foreign exchange markets for private clients and media groups including Bloomberg. She joined A Word About Wind as an analyst in late 2016, and produces news and analysis for newsletters and reports, as well as heading our deals and data operation.



Adam Barber

Managing Director

Tamarindo Group

Adam is managing director of the Tamarindo Group, a director of Tamarindo Communications and publisher of A Word About Wind. For the past 14 years he has worked in the financial services and energy investment space, enabling individuals and companies to build and protect their business and brands. Adam has worked in the City across a range of specialisms, including reputation management, public relations and stakeholder engagement.



Green growth: Anja-Isabel Dotzenrath became CEO of E.On Climate & Renewables in April

TAKING A COLD HARD LOOK

E.On Climate & Renewables CEO Anja-Isabel Dotzenrath spoke to Richard Heap about the firm's growth plans and disruptive trends

“I’m an optimist by definition. If you ever look back at what happened in the last ten years... the transition of this industry was so disruptive and I expect that this trend will go on.”

Anja-Isabel Dotzenrath, chief executive at E.On Climate & Renewables, is talking about how energy could evolve in the next decade. For example, she argues that grids should be able to “easily handle” significant growth in

electric vehicles because their charging schedules complement intermittent renewables, so can support the system when supply outstrips demand.

This optimism should come in handy given the geographical split of the utility’s 5.3GW wind and solar portfolio, of which 4.3GW is wind farms. Its core markets include the US, the UK and Germany, where companies are facing challenges in the form of President Trump, Brexit and the impact

of competitive tenders respectively. All three have an effect on the plans of E.On C&R, which has invested €10bn since it was formed in 2007.

A Word About Wind caught up with Dotzenrath to discuss the company’s strategy in these key markets and beyond. She also talked about progress on its large projects, including the 400MW offshore wind farm Rampion; her promotion to the position of chief executive of E.On C&R seven months



Brexit creates more uncertainty, and the volatility of the British pound is clearly challenging for an investor like us.



ago; and technology trends including storage and electric vehicles.

On land and sea

This year, E.On C&R is managing a €1.5bn budget for capital expenditure in renewables, and has four large wind farms on-site: two offshore in Europe and two onshore in the US.

These include Rampion off the UK's south coast, which hit a key milestone in September as installation finished on its 116 turbines, with full operations due next year. E.On owns 50.1% of it, with 25% held by Macquarie's Green Investment Group – formerly the UK Green Investment Bank – and 24.9% by Canadian investor Enbridge.

Construction also started in September on the 385MW Arkona in the German North Sea, in which E.On owns a 50% stake and Norway's Statoil owns 50%. The 60-turbine project is scheduled to be fully operational by 2019. Both Arkona and Rampion will bolster E.On's offshore portfolio, which includes assets such as a 30% stake in the 630MW London Array.

And in the US, construction is underway on its 278MW Radford's Run in Illinois and 228MW Bruening's Breeze in Texas, both due to complete this year.

E.On sees the US as a promising market, where it has 3GW of projects fully qualified under the wind production tax credit regime, and Dotzenrath says

she is not worried about the potential impact of President Trump.

“North America we still consider as very attractive in terms of wind investments because of the still-intact tax incentives regime, which we do not see is really in danger because of the political developments at the moment. We still have quite ambitious plans there,” she says.

In addition to onshore and offshore wind, E.On C&R focuses on utility-scale solar farms in its core regions of Europe and North America. Dotzenrath argues that solar will become a more significant part of the company's renewables portfolio, as the falling levelised cost of utility-scale projects mean it should play “the more dominant role in the energy transition”.

She adds that the company does not have an ideal portfolio split in terms of technology or regions, but would take a “cold hard look” at the merits of each scheme before investing: “We're always looking at the merit order of projects we have and then decide, basically, where to put the money and how to monetise our pipeline in the best possible way.”

But despite her stated optimism, Dotzenrath has concerns about some aspects of the firm's key European markets. She says E.On would not consider following utility rivals EnBW and Ørsted, formerly Dong Energy, into zero-subsidy offshore projects at

present due to the merchant price and technology risks. Instead, it will see how the market develops.

“Think about the projects which will be tendered today, reach financial investment decision in three to four years, and be commissioned in seven to eight years,” she says. “You have to already anticipate 12MW-15MW turbines otherwise you will not be successful in a tender, and those machines simply don't exist, even on paper... You need to not only go for the next generation but the generation after the next generation. Otherwise, you will not win.”

This is not her only concern in Europe. In Germany, she is reticent about bidding in the onshore wind tenders because they have been set up to favour community-led groups, which has “distorted the picture a little bit”.

Meanwhile, she says E.On C&R is still keen to invest in the UK, but highlights the uncertainty caused by Brexit and the Conservative government's ongoing hostility to onshore wind.

“We have quite a sizeable renewables exposure in the UK, and we are still very happy with our investments,” she says. “Brexit doesn't help, because it creates more uncertainty... and the volatility of the British pound is clearly challenging for an investor like us. We still have a high interest in the UK, and we would encourage the politicians and regulator



to revisit the decision to exclude onshore wind from the Contracts for Difference scheme.”

E.On C&R’s other key European markets include France, Italy, Poland and Scandinavia; and it is also looking at solar in Canada. But Dotzenrath says that its priorities keep changing, and admits that E.On C&R is relatively conservative when it comes to taking on country risk.

“Markets come and go, because a market that is attractive today can be utterly unattractive tomorrow... so you have to have a portfolio of markets, because it’s all about optionality,” she says. “It’s also clear that, talking about risk and return, we are not super-keen on taking big country risks, so we are more conservative when it comes to selection of geographies.”

Under her leadership, the company is unlikely to go gung ho into emerging markets: “In some cases we maybe have been a bit too conservative, so it’s about finding the right balance. Some of our competitors are a bit more active or even more international than we are. I lack the insight whether this has

proven to be a good or bad strategy,” she says. This interest in strategies has been key in her career thus far.

Sin of her youth

Dotzenrath joined E.On in 2011 after a career providing consultancy services for firms in the energy and chemicals sectors. She studied electrical engineering at RWTH Aachen University in Germany, and then economics as she never saw herself as a “hardcore engineer”.

After this, she started her career as a technical trainee at E.On’s fierce rival RWE, and spent two-and-a-half years in its distribution business.

Some keep reminding her of this fact: “Our CEO Johannes Teysen always says that this is a sin of my youth that I started at a competitor,” she says.

She then moved into management consultancy in her mid-20s, and worked for AT Kearney, Bain & Company and most recently Booz & Company. Her focus in this time was on energy and chemicals businesses in the US, Europe and Asia; and rose to become a partner at Booz & Company.



Our CEO Johannes Teysen always says that this is a sin of my youth that I started at a competitor.





But when E.On came calling, she took the chance to return to energy.

“I always wanted to come back,” she says. “E.On was my client and, if you don’t do things terribly wrong, then sometimes your client asks you to join. That’s what happened in my case as well.”

Her first role at E.On was managing director of its in-house consulting arm. She then became chief operating officer at E.On Climate & Renewables, in a three-person management team. She became CEO in April after Michael Lewis became CEO of E.On UK, and is now in charge of the German utility’s renewables strategy.

Renewables is still a fairly small part of the E.On business, compared to its energy networks and customer solutions divisions. The utility reported total sales from renewables of €710m in the first six months of 2017, or 3.6% of the total sales of €19.6bn. It performed better on profits, with renewables contributing €205m profits for the period, or 11.6% of the total.

Being part of a large utility clearly has its advantages, not least the financial clout. E.On C&R funds most of its schemes from its balance sheet, with the exception being the US where it uses tax equity financing. To fund its global expansion in renewables, E.On C&R looks to sell stakes in its developments to enable it to recycle capital.

And she sees no shortage of interest from strategic investors or pure

financial players: “If you can provide an investor with a new asset which is maybe a year in operation, where E.On is the O&M service provider and also has skin in the game because we’re also a co-shareholder, then I think this is very attractive. I would say there is an abundance of money and I don’t expect any problems with finding partners to monetise capabilities,” she says.

In addition to growing its portfolio organically, Dotzenrath says the business looks to make small project purchases – “little portfolio enhancements here and there” – but is not looking to make large strategic acquisitions. If anything, E.On has been looking to make sales, and sold a 46.7% stake in Uniper for €3.8bn in September ahead of a potential full sale.

Technology trends

E.On C&R has made some small strategic investments in emerging technologies, though.

The utility has been growing its storage operation for the last two years, and in June completed its first storage scheme in North America by pairing a 10MW battery facility with a solar project. It is following this with two storage projects totalling 20MW in Texas that are set to be linked to existing wind farms in Pyron and Inadale, and where work is due to complete this year.

It is also working on a 10MW battery facility close to its 30MW biomass combined heat and power plant Blackburn Meadows near Sheffield in

the UK. While storage is still a small part of the E.On empire, Dotzenrath says it is a vital market for the firm.

“I think, as a renewables player, you have to have this capability,” she says, adding that it opens up new ways to make assets more competitive and to commercialise them. E.On is learning on small projects and adjusting its strategy every six months.

This is not the only emerging tech market that has enticed the company. In April, it announced plans to invest €3m in an airborne turbine test site in County Mayo in the Republic of Ireland with Dutch firm Ampyx Power. These turbines are attached to drones and can operate up to 450 metres in the air.

She says: “It’s good to have a close eye on what’s happening in the market and to pick those potentially disruptive technologies and understand them better, because maybe they can destroy your business model. That’s why we decided to do it, but it’s early days.”

A final potentially disruptive trend that could bring huge benefits for wind is electric vehicles. This is not Dotzenrath’s area of focus in E.On, but she personally likes electric vehicles because she drives a plug-in hybrid and plans to go fully electric.

For the wind sector, she says electric vehicles are a huge opportunity to help stabilise the grid, because they can be charged at times when renewable power production exceeds demand.

Growth in electric vehicles needs to be underpinned by government support, and we have seen countries including France, India and the UK commit to phasing out sales of new petrol and diesel cars by 2040.

Dotzenrath says this could mean huge change for wind: “I do not think we have the slightest imagination about convergence between the sectors and what will happen in the next decade. I think we will all be surprised.”

Dotzenrath may be optimistic about these trends, but her and the firm’s approach on a daily basis is more considered. And there’s no harm in that. You can’t take a ‘cold hard look’ if your optimism is the blind kind. ■

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ANALYSING THE TOP 100

Wind has proven resilient to major shocks this year, and these have shaped our sixth Top 100 Power People. Research by Ilaria Valtimora

It has been a great 18 months for people who like political shocks. From the UK's Brexit vote to the election of President Trump, it has been a tumultuous time.

Despite this, the global wind industry has remained remarkably resilient – and this story of resilience is one of the biggest trends that has affected the make-up of the sixth-annual Top 100.

The US wind sector has kept growing well onshore while making progress offshore; those working in the offshore sector have delivered stunning price drops in Europe, while also firing up in new markets; and onshore tenders in nations including Germany and Spain have brought new firms to the fore.

The overall composition of the Top 100 shows a minor change from previous years, with 47 of the top 100 coming from developers and utilities (see top left graph, page 12), up from 42 last year. It is particularly worth noting that 19 of our new entrants to the Top 100 Power People come from the developer and utility world, with 15 from firms that have never featured before.

We attribute this influx of new firms to three significant trends this year.

First, six of these 15 people represent companies that are working on significant offshore wind projects in Europe and Asia (China Three Gorges, EnBW, Eolfi, Shell, Swancor and Van Oord). Some of them are building

large schemes in Europe, while others are looking at new markets or new technologies like floating wind. Their inclusion shows the market is evolving.

Second, four of these 15 are from firms that are keeping development in the US ticking along despite President Trump's well-known hostility to wind (Power Company of Wyoming, Southern Power, Tradewind and Xcel). These companies are playing a vital role in driving the market forward despite Trump's plans to reignite the US coal industry.

And third, businesses like Forestalia, Fortum and UKA Group have emerged because they won big in renewable energy auctions held in Spain, Russia and Germany respectively.

There is also a shift in the split between onshore and offshore (see top right graph, p.12). For the first time, more than half of the people (51%) on the Top 100 work in roles where they focus on offshore wind either exclusively or as part of their role. Offshore wind is still a small part of the overall market, but it is always well represented in the Top 100 due to the size of the deals.

Predictably, Europe and North America remain key for our Top 100 (see bottom left graph, p.12); and we have seen a total of 36 new entrants this year (see bottom right graph, p.12), including 21 from companies that have never had a representative on the Top 100 before. This is mainly due to the trends above, and the growing prominence of floating technology. The opening of the 30MW Hywind Scotland scheme in October is a big step for this part of the sector.



Installing Hywind: More floating wind specialists feature on this year's Top 100

Source: Statoil

Finally, 15 of the final 100 are women, compared to 11 in 2016 and seven in 2015. Three from last year's Top 100 dropped out this year due to job changes or a lack of visible deal activity, and we have seven new female entrants.

In part, this is because we are more aware of the work of the sector's top

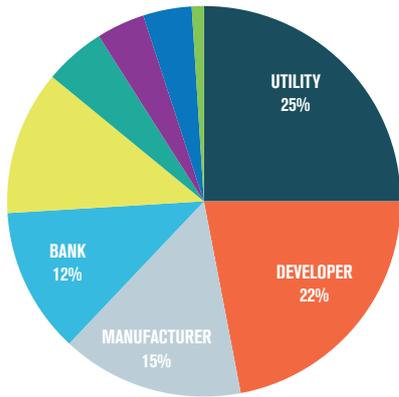
women after our Women's Power List for International Women's Day in March, and because two women – Anja-Isabel Dotzenrath and Laura Beane – have become CEOs at utilities (E.On Climate & Renewables and Avangrid Renewables respectively).



This indicates that companies involved in the wind industry are happy to promote their board-level women to the top job – but also that gender equality in these roles is a long way off. We will check back in 2018 after another busy year. ■

Breaking down the Top 100

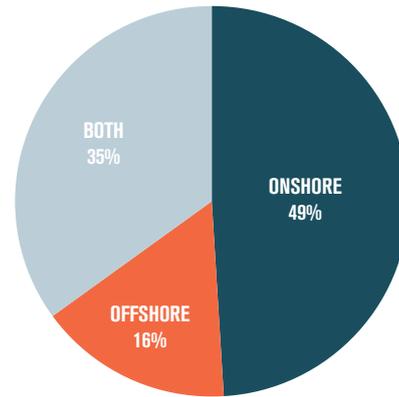
UTILITIES AND DEVELOPERS LEAD THE WAY AGAIN



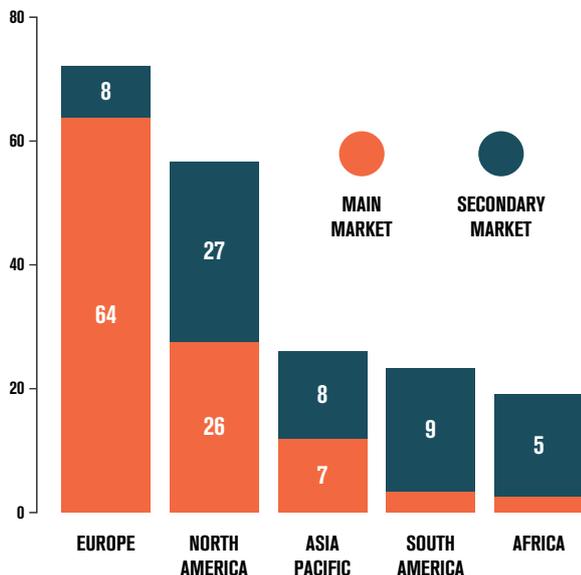
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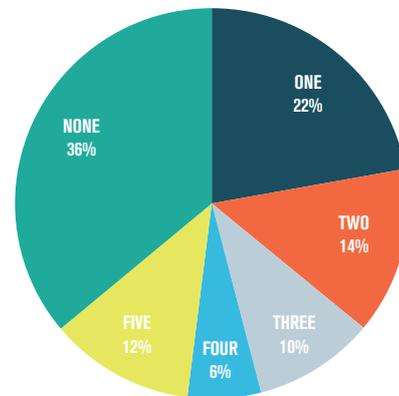
OVER HALF OF THE TOP 100 IS INVOLVED IN OFFSHORE WIND



NORTH AMERICA'S IMPORTANCE GROWS



PREVIOUS APPEARANCES IN TOP 100 POWER PEOPLE



100

NEW ENTRY


Kari Kautinen *SVP of M&A and Solar & Wind Development, Fortum*

Finnish utility Fortum has come onto our radar in the last year after making inroads into the fledgling Russian wind market, where in June it won the right to build projects totalling 1GW, and buying projects in established markets in Norway. Kautinen has been at Fortum since 1998, including a decade as senior vice president of M&A, with wind and solar development added to his role in April 2016. This means he is tasked with enabling Fortum to reach its target of 1GW installed capacity by the end of this decade.

99

NEW ENTRY


Nicolas Paul-Dauphin *CEO, Eolfi*

Floating wind technology has been rising up the sector's agenda in the last year, and it is not all about Statoil's Hywind. Paul-Dauphin is CEO of French developer Eolfi, which has worked on wind and solar projects since 2004 and has completed 670MW, with a further 6.5GW in development. Last year, the firm won a tender in France to develop a 24MW floating wind farm off the country's south coast with CGN Europe Energy, and attracted investment from Caisse des Depots and Meridiam in May. Paul-Dauphin has been at the business since 2012.

98

NEW ENTRY


Emma Tinker *Director, Asper Investment Management*

Tinker is a director at Asper Investment Management, which was spun out of HgCapital's renewables business in July 2016 to develop investment strategies and fund structures for the evolving renewables sector. She founded HgCapital's renewables arm in 2002 and was key as it grew into one of the leading private equity players in the sector in Europe. Since 2011, Tinker has focused on firms including Irish developer Invis, which agreed the sale of 60% of its €300m Irish portfolio to a Japanese group in July, and is director at companies including Good Energy.

97

NEW ENTRY


Rob Freeman *CEO & Co-Founder, Tradewind Energy*

Freeman is CEO and a founding member of US developer Tradewind, which he set up in Kansas City in 2003 with backing from local angel investors. In 2006, he led the formation of a partnership with Italian utility Enel, and they have since completed wind and solar projects worth over \$5bn in the US – with plans to double that in the next three years. Highlights of the last 12 months included the start of construction on the 300MW Red Dirt in Oklahoma in April; and the completion of the 108MW Drift Sand and 65MW Chisholm View II, also in Oklahoma.

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LAST YEAR: 97


Alexandra von Bernstorff *Managing Partner & Co-Founder, Luxcara*

Founded in 2009, Luxcara specialises in buying, structuring, financing and operating wind and solar portfolios; and manages an investment volume of around €1.2bn. Co-founder von Bernstorff has over ten years' experience in renewables investment, and was previously chief executive of investor Renewagy, where she worked with Luxcara co-founder Kathrin Oechtering. In the last year, the firm has expanded its presence in Norway, where it secured a power purchase agreement at a 111MW scheme and bought a 263MW wind portfolio in May.

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95

NEW ENTRY



Paul de la Gueriviere *CEO, Ideol*

Ideol founders Paul de la Gueriviere and Pierre Coulombe set up the company in 2010 to design floating turbine foundations that would be cheaper than rivals. Seven years on, with de la Gueriviere at the helm, its technology is set to be tested at France's first floating wind turbine, the 2MW Floatgen that is due to complete this year; and a 3MW pilot project in waters off the coast of Japan in 2018. It is also partnering with Gaelectric in the Republic of Ireland, and linked up with Atlantis in January for a 100MW project in UK waters.

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LAST YEAR: 100



Alla Weinstein *Founder, Trident Winds*

Weinstein is a well-known figure among those with ambitions to develop the floating wind sector. She left her role as CEO and founder of floating foundation developer Principle Power after eight years in 2015 to set up Trident Winds, which is planning to develop an up-to-1GW floating wind farm off the coast of California. Weinstein chose California because of a law signed in late 2015 that committed the state to produce half of its electricity from renewables by 2030, but progress has been slow as state regulations take shape.

93

LAST YEAR: 98



Laura Folsie *CEO, BP Wind Energy*

Folsie heads the wind operations of global oil and gas company BP, where she leads a team that operates 14 wind farms in the US with total headline capacity of 2.6GW. She took up the role in early 2016 but her experience at BP stretches back to 1998, and she spent the 16 years before that at US oil company Amoco. Folsie is tasked with leading BP's plans to grow in wind after it looked to exit the sector on two occasions, and is evaluating opportunities in the US. This includes a potential to re-engineer its 2,000 turbines to add capacity of 400MW.

92

LAST YEAR: 91



Fraser McLachlan *CEO, GCube Insurance Services*

McLachlan leads renewables insurer GCube, which has insured over 85GW of renewable energy projects globally in the last 25 years. With one foot on each side of the Atlantic, GCube is a major force when it comes to managing project risk. Its recent innovations have included a 'weather risk transfer' product, which enables investors to protect returns from their projects when wind speeds are low. The company is also working on 'proxy revenue swaps', which help to mitigate the risks of price volatility.

91

NEW ENTRY



Sue Milton *Senior Director (Energy, Structured Finance), Royal Bank of Scotland*

Milton is senior director in the structured finance team at Royal Bank of Scotland and, while she has a longstanding interest in the wind sector, this is her first appearance in the Top 100 Power People due to her low profile. Even so, Milton continues to exert influence over the direction of RBS's energy investments. In 2016, 49% of the bank's structured lending in UK energy went to wind projects. Its recent deals include the £2.6bn financing of the 588MW Beatrice, and supporting Macquarie on its £1.6bn buyout of half of the 573MW Race Bank.

90

NEW ENTRY



Juliet Davenport *Founder & CEO, Good Energy*

Davenport set up Good Energy in 1999 to sell 100% renewable energy and, as of June 2016, supplied more than 72,260 customers with electricity from renewables. The company also owns projects including Delabole wind farm, which was the first commercial onshore wind farm built in the UK, and is working on plans for the UK's first subsidy-free wind farm. Good added offshore wind to its energy mix in March by signing a power purchase agreement with Dong Energy (now Ørsted) to buy 12% of the output from the 210MW Westernmost Rough. The pair said this signalled the beginning of "wider cooperation" between the companies.

89

NEW ENTRY



Laszlo Varsanyi *VP of New Ventures (Power), Enbridge*

Varsanyi has spent two decades at Canada's Enbridge, and became vice president of new ventures in power last year. This means he is in charge of growing the firm's portfolio in sectors including offshore and onshore wind. Since 2002, Enbridge has committed around \$5.9bn capital to renewables and transmission projects totalling 3.8GW, of which 3.3GW are wind farms. Enbridge has this year bought 49.9% of EnBW's 497MW Hohe See the 112MW Albatros, to go with its 24.9% Rampion stake. It also bought Spectra Energy for \$28bn.

88

RE-ENTRY



Adebayo Ogunlesi *Chairman & Managing Partner, Global Infrastructure Partners*

Ogunlesi is chairman and managing partner at fund management firm Global Infrastructure Partners, which manages over \$40bn for its investors. In the energy sector, GIP owns an estimated 24% stake in Spanish investor Saeta Yield, and is due to complete a \$5bn buyout of Asia-Pacific specialist Equis Energy early next year. In August, GIP agreed to acquire a 50% stake of the 450MW Borkum Riffgrund 2 offshore project from Dong Energy (now Ørsted) for €1.2bn. This follows the acquisition by GIP of a 50% stake in Dong's Gode Wind 1 scheme in 2015. Ogunlesi was also a member of one of President Trump's short-lived business councils.

87

NEW ENTRY



Chris Brown *President of Sales & Service, Vestas Americas*

Brown joined Vestas in 2012 and, under his leadership, the business has reinforced its status as a key player in the US – and even edged out General Electric and Siemens to become the market's largest turbine supplier last year. North American sales accounted for 50% of total Vestas orders in 2016, with 4.3GW of its turbines installed in North America out of a total of 8.7GW globally. Prior to Vestas, he served as chief operating officer for the City of Detroit for two years; and was also founder and CEO of leading US offshore firm Deepwater Wind.

86

NEW ENTRY



Robert Tsai *Chairman & CEO, Swancor*

Taiwan is one of the world's hottest emerging offshore wind markets and Tsai is one of its early leaders, as a result of his position as chairman and CEO of developer Swancor. The firm is working with Ørsted and Macquarie Capital on the 128MW Formosa 1, where the two-turbine 8MW first phase completed in October 2016 and a 120MW second phase is due to be built in 2019, subject to final investment decision. We do not expect Formosa 1 to be the largest wind farm in Taiwanese waters but it is the first, and pioneers like Tsai are vital to growth in that market.

85



NEW ENTRY

Siobhan Smyth *Head of Debt, Energy (EMEA), Siemens Bank*

Smyth is head of debt for the energy sector in EMEA and Asia at Siemens Bank, where she oversees its debt exposure in renewables including wind. She joined the bank in 2012 and, before that, spent four years as director for the global renewables team at HSBC. Smyth has also spent 14 years at Royal Bank of Scotland, including as senior director in its power team. Her current team recently acted as mandated lead arranger on projects including Beatrice, Dudgeon and Race Bank; and she wields huge influence both within the bank and outside.

84



NEW ENTRY

Kay Dahlke *MD, UKA Group*

Citizens' groups were the big winners of Germany's first two onshore wind auctions totalling 1.8GW, with UKA Group hoovering up support for 42 projects with total capacity of 690MW in the 1GW second round alone – of which 37 were citizens' projects. This has helped to raise the profile of the German developer, which has been led by Dahlke for the last two years and employs 450 people. The company completed projects totalling 204MW in Germany in 2016, and this year grew into the US, where it has a 1GW wind and solar project pipeline.

83



LAST YEAR: 84

Steinar Bysveen *EVP of Wind Power, District Heating & Projects, Statkraft*

Bysveen joined this Norwegian utility in 2010 and is heavily involved with leading its wind strategy. The company is now focused on expanding onshore, with key projects including the 1GW Fosen complex in Norway, as it does not have the financial clout to compete offshore. This year it has sold its 25% stake in the 4.8GW Dogger Bank zone to Statoil and SSE; and is set to sell its stakes in the 402MW Dudgeon and 317MW Sheringham Shoal. It also exited the 860MW Triton Knoll project last month after winning Contracts for Difference support from the UK Government.

82



NEW ENTRY

Jose Luis Blanco *CEO, Nordex*

Blanco took over as CEO of German manufacturer Nordex in March after the departure of his predecessor Lars Bondo Krogsgaard, who lasted less than two years in the job. It has been a busy couple of years for Nordex, which bought Acciona's wind operations for €785m in 2016 but is now forecasting a sales drop for this year. Blanco is tasked with reviving the firm's financial fortunes. He has been deputy CEO and COO at Nordex since the Acciona deal, and previously spent four years as CEO of Acciona's wind arm.

81



NEW ENTRY

Laura Beane *CEO, Avangrid Renewables*

Beane became CEO of Avangrid Renewables in May after predecessor Frank Burkhardtmeier moved on. Beane started at US utility PacifiCorp 22 years ago and has stuck at the business through various changes of ownership, to its current status as Spanish firm Iberdrola's US arm. Avangrid owns assets worth \$10bn, including wind farms with total capacity of 6GW in 22 US states. The company's highlights of this year includes winning the rights to build the up-to-1.5GW Kitty Hawk offshore wind farm off the US coast, and buying a 50% stake in the up-to-1GW Vineyard Wind project off the coast of Massachusetts.

80



LAST YEAR: 59

Marc de Jong *CEO, LM Wind Power*

After a successful career at Dutch technology company Philips, de Jong took over as CEO of LM Wind Power in 2015. LM is the world's largest blade manufacturer and, since 1978, has produced more than 195,000 blades equating to 84GW of installed wind capacity, including the world's longest blade. In April, General Electric completed the acquisition of LM for €1.5bn, to bring blade design and manufacturing in-house. This is set to include an offshore factory in northern France that LM announced in February, which is due to open in 2018. LM also won deals with Chinese pair Envision and Goldwind in October.

79



NEW ENTRY

Jef Colruyt *CEO, Colruyt Group*

Jef Colruyt started working for Belgian retail group Colruyt, founded by his grandfather, in 1987 and took over as CEO in 1994 following the death of his father. The business took its first step in wind in 1999 as it installed a wind turbine at one of its distribution centres, and set up offshore developer Parkwind with PMV and Korys in 2012. Colruyt owns a 60% stake in Parkwind, which has developed the 216MW Northwind and 165MW Belwind; is poised to complete the 165MW Nobelwind next month; and last month became a strategic partner on the 330MW Oriel wind farm in waters off the Republic of Ireland.

78



LAST YEAR: 92

Gernot Blanke *CEO, WPD*

Blanke co-founded German developer WPD in 1996, and set up its offshore arm five years later, in 2000. Since then, the group has developed projects totalling 4.1GW, and plans to develop a further 7.5GW onshore and 5.6GW offshore. These include an 865MW scheme in the German Baltic Sea. WPD is also one of the owners of the 288MW Butendiek offshore wind farm in the German North Sea, which concluded a €950m refinancing in March; and, in September, linked up with Taiwanese province Taoyuan to develop two offshore projects totalling 523MW. Last year, the firm also moved into the US by buying part of Volkswind.

77



LAST YEAR: 76

Markus Lesser *CEO, PNE Wind*

Lesser took over as chief executive of German developer PNE Wind in 2016, after joining as chief operating officer in 2011. Under his leadership, in the last 12 months the firm has sold 80% of its 142.5MW German portfolio to Allianz Global Investors so it can re-invest in new projects; and sold its 584MW Atlantis offshore project in the German North Sea to Swedish utility Vattenfall. In the US, PNE finalised the sale of the 80MW Vivaldi Springtime project, located in the state of Montana, by subsidiary WKN to Pattern Development in July.

76



NEW ENTRY

Brandon Prater *Head of Private Infrastructure Europe, Partners Group*

Prater is head of private infrastructure for Europe at Swiss-headquartered investor Partners Group, and has been chairman of its private infrastructure investment committee since June. He took the place of Michael Barben in our Top 100 for his broader view and involvement on the firm's investments globally. Under his leadership, the firm invested in December AUD250m (\$196m) into the 270MW Sapphire wind farm in Australia. This followed its previous investment in Australia, at the 240MW Ararat scheme. The firm made its debut in the offshore sector in 2016 by investing in the 400MW Merkur project.

ROCK SOLID

BlackRock's David Giordano talks to Richard Heap about the world's largest wind and solar fund, and Trump's first year



Big money: David Giordano leads BlackRock's \$1.65bn global fund

It is a year since Donald Trump achieved his shock US presidential win – but, so far, his angry anti-wind rhetoric has not resulted in much damaging anti-wind policy.

He may even have had some positive impacts. A Word About Wind talked to David Giordano, head of renewable power in the Americas and Asia-Pacific at BlackRock, about the final close of its \$1.65bn Global Renewable Power II fund in July.

The financial giant secured investment from 67 institutions in North America, Europe and Asia; and its \$1.65bn close far exceeded the \$1bn planned.

This means Giordano is in charge of the world's largest dedicated wind and solar fund, and he argues that Trump's win might have helped the fundraising. He says uncertainty for investors caused by global shocks, including Trump's victory and the UK's vote for Brexit last June, pushed more investors to look at wind and solar because they are stable assets without the volatility of public markets.

“You've got contracted, steel-in-the-ground assets that are making power and selling that power under contract,” he says. “While we certainly addressed a lot of questions about our view of the impact of both Brexit and the US

election, from our perspective I think we were able to answer that pretty satisfactorily to investors.”

Giordano also spoke about BlackRock's strategy for investing in wind; and his views on the big challenges for the sector in the US for the rest of Trump's four-year term.

Getting a GRP

BlackRock needs little introduction. Headquartered in New York, where Giordano is based, it is one of the world's largest investment firms and has operations around the world with \$5.4tn of assets under management. The renewables investment team

sits within BlackRock Real Assets, which specialises in real estate and infrastructure investments. BlackRock Real Assets has assets under management worth \$30bn.

Of this, around \$4.2bn is in renewable energy and, since 2012, the firm has invested in over 100 wind and solar projects globally. GRP II is its second global renewables fund, and the world's largest dedicated wind and solar fund. It is three times larger than BlackRock's first GRP fund, which set the precedent for the GRP II approach.

In addition to that, BlackRock manages regional renewables funds, such as its £1.1bn Renewable Income UK fund that reached its final close in July.

Giordano says that GRP II's fundraising was boosted by the fact it achieved its first close of \$350m in November 2015: "What's great about getting that first close done is we can also start deploying capital at that point, and that really helps to build the momentum in the fundraising," he says. That takes the fund from a concept to reality.

The fund's investors are mainly institutions including insurance firms, pension funds, and a set of endowments and family offices.

To date, around \$450m of the \$1.65bn in GRP II has been invested. Giordano and his team are looking to invest the rest in the next five years, by 2022. Its

target portfolio is around 75% wind and 25% solar; and 50% in the US.

Its assets so far include the 160MW Tellenes wind farm in Norway, which has a power purchase agreement with Google; projects produced by its partnership with Italian utility Enel on solar farms in Minnesota; an operational wind farm in the US; and another project in Japan.

BlackRock is also working with Alterra on the 200MW Flat Top wind project in Texas, and has long-term partnerships in place with utility giants including EDF and E.On.

While the fund's investors are happy to take development and construction risk, this means BlackRock must be smart about picking its development partners. The company sees itself, says Giordano, as a strategic capital partner, which can work with a development partner – either a large utility like EDF or a smaller developer like Alterra – that provides on-site operational and management services for the projects.

And he says it does not always have to be big utilities: "If you look at Norway... or some of our opportunities here in the United States, we will use regional developers who are very sophisticated and aren't necessarily the big balance sheet utility players like EDF, Enel or E.On," he says, although those big utilities do give much-needed consistency and stability.

When picking these partners, it helps that Giordano has a background in project development.

Before joining BlackRock in 2011, he was chief operations officer and chief financial officer at regional utility-scale developer Community Energy Holdings. Previously, he was a founding member of Babcock & Brown's North American infrastructure team, where he advised clients including Airtricity; and worked at NextEra forerunner FPL Energy. This gives him a good appreciation of the practical challenges facing US wind.

Tackling transmission

One of the industry's most pressing challenges is improving the grid so that low-cost wind energy can be moved from the best wind sites – which tend to be in remote areas in the heart of the country – to cities where it is most needed, including on the coasts.

Giordano says it is tough to build the transmission lines required because the developments need support from affected states and landowners, but adds that funding is not a problem.

"It is a classic partnership between government and private investment. There is certainly a lot of capital that is interested in transmission investments but, to facilitate the opportunity, it is going to require government working with the developers to make sure that those assets can be built and de-risked," he says.

Whether there is appetite for these projects from US federal government remains to be seen. And the challenge of building transmission lines onshore is also an argument in favour of developing wind farms offshore. This is a way to build new capacity near cities but without many of the arguments over land ownership that hamper progress onshore.

He says BlackRock is paying attention to investment opportunities in North American offshore wind, particularly off the east coast, but only expects to see "material growth" in this part of the sector if there is more investment in building the supply chain.

"You're going to see development along the east coast," he says. "Given the density of population, the demand



Starting blocks: The 30MW Block Island has made investors look at US offshore wind

Source: AWEA



Clinton's administration would not have been as positive as some people might have thought, and the Trump administration is not as negative.



All bark: President Trump has not hit wind in his first year

Source: Gage Skidmore via Flickr

for power and the constraints on capacity for bringing power to those regions, those are the places where offshore wind power can make a lot of sense. That being said, we don't have the infrastructure they do in Europe."

Until that happens, the vast majority of opportunities for investors in US wind are still onshore.

Giordano points to the fact that around 30% of all infrastructure spend in the US now is on renewables, and there is "more capital focused on investing in projects in the US than there were five years ago and certainly ten years ago".

This competition is good for developers because it enables them cut their cost of capital for construction, and reduces their levelised cost of energy.

But Giordano warns developers not to fixate on trying to secure the absolute lowest cost of capital: "These assets, you can't put them on the shelf and continue to shop for the cheapest capital. They have deadlines associated with them at the project level, and so you need reliable capital as much as you need efficient capital," he says.

Even so, this cost-cutting helps make wind more attractive when owners seek to secure off-take deals with utilities and corporates; and allows wind to compete with cheap natural gas.

Last year, US gas prices hit their lowest levels since 1999, and Giordano says this will keep putting pressure on other sources to generate electricity cheaply.

"If gas is largely the marginal fuel for power production in the US, we're going to be in this low power price environment for an extended period of time," he says. This means BlackRock must continue to focus on projects that are "fundamentally sound".

Market volatility

Fierce competition for assets means that investors must be careful to not overpay. But while there is competition, the investment market for renewables is steadier than it was two years ago, when publicly-listed renewable energy yieldcos were spending big and driving up asset prices.

The problem with these vehicles is that their growth depended on buying more assets, which meant major competition for projects and high prices being paid. When disasters hit, notably the high-profile collapse of SunEdison from mid-2015, investors took fright and the whole of the green yieldco market suffered as a result.

Giordano says investors should be wary about relying for returns on vehicles that are listed on the public markets, with all of the volatility that brings, as there is "nothing [a yieldco] can do at

the asset level to change course" when sentiment turns negative.

Of course, one of the biggest sources of potential volatility for US wind comes from the man in the White House. Wind sceptic President Trump may have an interest in backing wind because it now supports over 100,000 US jobs, many of which are in the manufacturing sector in Republican heartlands, but he is still introducing new financial support for the coal industry.

Despite this, he appears to have little appetite for a faster reduction in the production tax credit, which is coming to an end in 2019: "That is the indication we're getting consistently from Washington," agrees Giordano.

Most activity in the US wind sector is driven by supportive states and city policies, as well as support from corporates who have committed to use renewables, and Giordano adds: "The Clinton administration wouldn't have been as positive as some people might have thought, and the Trump administration is not as negative."

The investment case for US wind is still fundamentally sound, and there is little evidence that Trump is seeking to harm wind farms. From North Korea to Puerto Rico, from home-grown terrorism to Obamacare, the president has bigger things to worry about. ■

75



LAST YEAR: 56

Nick Gardiner *MD & Head of Offshore Wind, Green Investment Group*

The transition of the UK Green Investment Bank from the UK Government into the hands of Australian bank Macquarie in a £2.3bn deal has been made that bit easier with the expertise of wise heads such as Gardiner. He joined GIB in 2014 from BNP Paribas and has played a key role in the last three years as its head of offshore wind. In total, the bank has invested £1.6bn in nine offshore projects with total capacity of 3.2GW since it was founded in 2012 and, now it is part of Macquarie, Gardiner can shift focus from the UK to the whole world.

74



NEW ENTRY

Lorna Shearin *MD, RBC Capital Markets*

Shearin is managing director and head of infrastructure fund coverage at the Royal Bank of Canada, with responsibility for renewables. During more than 20 years in the banking sector, Shearin has worked on a host of leading M&A and debt financing transactions. In recent years, she and her team have advised on major deals including Macquarie's acquisition of the UK Green Investment Bank; the sale of the Infinis onshore wind portfolio by Terra Firma to JP Morgan Asset Management; Dong Energy's IPO in 2016; the sale of Bord Gais Energy to Centrica for €1.1bn; and multiple deals for Greencoat UK Wind, as well as its recent fundraising.

73



LAST YEAR: 71

Anette Eberhard *CEO, EKF*

Eberhard leads Denmark's export credit agency EKF, which provides financing, credit and guarantees that help Danish wind firms to grow overseas. It concluded deals worth around €2bn in all sectors last year and wind amounts to about 60% of the company's total exposure. EKF is backing huge developments including EnBW's 1GW Wind Bundle project in Turkey; the 588MW Beatrice in UK waters; and the 310MW Lake Turkana in Africa. It is also involved in the re-financing of the 600MW Gemini offshore wind farm; and, in August, took part in the \$600m financing for Zuma Energia's 424MW Reynosa wind farm in Mexico.

72



NEW ENTRY

Lu Chun *Chairman, China Three Gorges Corporation*

As chairman of China Three Gorges Corporation since 2014, Lu has helped this state-owned hydro group increase its presence in the wind sector. CTG has a long-standing relationship with Portuguese group EDP Renovaveis, with which it entered a €2bn partnership in 2011, and its most recent deal with EDPR was buying a 49% stake in a 422MW wind portfolio for €242m. Three Gorges also owns a 30% stake in the 1.1GW Moray Firth offshore project off the Scottish coast, and bought a majority stake in Meerwind developer WindMW in 2016.

71



NEW ENTRY

Mark Gainsborough *EVP of New Energies, Shell*

Gainsborough joined oil and gas giant Royal Dutch Shell in 1980, and was appointed to lead Shell's newly-created New Energies division in June 2016. The utility plans to invest up to \$1bn a year in low-carbon projects by the end of the decade, and has a particular focus on offshore wind farms. In December 2016, a group led by Shell won the right to build the 700MW Borssele 3 and 4 projects in Dutch waters with a subsidy of €54.50/MWh, and Gainsborough has also argued that governments should back offshore wind projects of up to 10GW each.

70



LAST YEAR: 61

Dana Younger *Chief Renewable Energy Specialist, International Finance Corporation*

Younger has spent a quarter of a century at the International Finance Corporation, including 19 years as senior specialist on renewables. The IFC is the private lending arm of World Bank Group and, under Younger's guidance, its lending packages are important for developers expanding in new markets. In April, the IFC partnered with European investment manager Amundi and set up a \$2bn fund to buy green bonds issued by banks in emerging markets; and, in July, launched a \$6bn programme to invest in renewables in India over the next five years.

69



LAST YEAR: 87

Declan Flanagan *CEO, Lincoln Clean Energy*

Flanagan set up Chicago-based developer Lincoln Clean Energy in 2009, and led it as it first raised \$250m from investor I Squared and was then acquired by the firm in late 2015. The firm has already developed a renewables portfolio of over 1.5GW involving over \$2bn in capital investment, and currently has 500MW of wind and solar projects under construction. In the last 18 months, Lincoln has secured \$350m in project finance for the 250MW Willow Springs project and \$350m for the 253MW Amazon Wind Farm, both of which are in Texas. It commissioned the latter project in October.

68



LAST YEAR: 75

Ted Brandt *Co-Founder & CEO, Marathon Capital*

Brandt co-founded Marathon Capital in 1999 to provide independent investment banking and financial advisory services in the North American wind industry. In those 18 years it has advised on more than 100 projects, with highlights of the last 12 months including advising Fiera Infrastructure on the purchase of equity interests in 11 wind and solar farms totalling 921MW; advising PRC on the disposal of its 470MW wind development portfolio to Tenaska; and acting for Lincoln Clean Energy on a sale of two projects totalling 460MW to Starwood.

67



NEW ENTRY

Pieter Van Oord *CEO, Van Oord*

Pieter Van Oord is the fourth generation to work at this fifth-generation marine engineering firm, which celebrates its 150th anniversary next year. He joined in 1994, and became CEO in 2008, in which time the firm has established itself in the offshore wind sector. He enters the Top 100 this year for Van Oord's work on Northland Power's 600MW Gemini, which became operational in May; and its involvement in the Shell-led consortium that won the 680MW Borssele 3 and 4 tender in December and stunned the industry with its low cost of energy. Van Oord will provide key technical insights as the industry adapts to low and no subsidies.

66



NEW ENTRY

Jonathan Taylor *VP, European Investment Bank*

Taylor is VP at the European Investment Bank, the world's largest international public lending institution. In 2016, the EIB awarded more than €8.6bn of financing to renewables and energy efficiency projects. Highlights in wind over the last year include a €300m financing agreement to support construction of the 309MW Rentel wind farm in December; a €115m loan agreement for a 200MW wind farm in Egypt in March; and the approval of €4.3bn of financing for new energy projects, including wind, across Europe and in India in July. The EIB is also contributing with a £525m loan to the construction of the 588MW Beatrice wind farm.

65

LAST YEAR: 69



Mortimer Menzel *Partner, Augusta & Co.*

Menzel has over 25 years' experience in the banking and legal sectors, and has spent the last 11 years placing equity finance in renewables deals. At Augusta, Menzel has originated and executed important transactions including sales of turbine manufacturers, and carried out M&A on over 20 offshore wind projects and a host of onshore schemes. His highlights of the last 12 months include the sale of Velocita's 500MW onshore wind pipeline in France to Envision and the sale of Velocita's 46.5MW onshore portfolio in Scotland to an NTR fund.

64

LAST YEAR: 74



Sumant Sinha *Chairman & CEO, ReNew Power*

Sinha set up this Indian wind and solar developer in 2011 with \$250m from Goldman Sachs, and previously worked for turbine maker Suzlon. He has continued to accrue funds this year, with a \$390m debt package from the Asian Development Bank in January for 700MW of projects, including 311MW of wind farms; and, in February, he raised \$200m by selling a 10% stake to Japan's JERA. Since then, Sinha has raised \$100m to grow his stake in ReNew ahead of its planned IPO, which is set to be worth around \$600m.

63

NEW ENTRY



Buzz Miller *President & CEO, Southern Power*

Miller has worked for US utility Southern Company for 30 years, and became president and CEO of its subsidiary Southern Power in February 2016. Under his leadership, Southern has stepped up its activity in the wind sector: the company currently has nine wind farms with total capacity of 1.6GW, and in January signed a pact with RES to develop ten more totalling 3GW by 2020. Southern has also this year bought the 174MW Salt Fork and 126MW Tyler Bluff projects from EDF Renewable Energy, and the 148MW Cactus Flats from RES Americas.

62

NEW ENTRY



Marshal Salant *MD & Global Head of Alternative Energy Finance, Citi*

Salant is managing director at US-headquartered banking group Citi and global head of its alternative energy finance group in the capital markets origination division. In this role, he has focused on the development of financial solutions for industries including wind, such as construction financing, project equity and tax equity. For example, in the last year he has helped Goldwind to reach financial close on its 160MW Rattlesnake scheme in Texas, and also backed the first US offshore wind farm, the 30MW Block Island.

61

LAST YEAR: 82



Tristan Grimbert *President & CEO, EDF Renewable Energy*

Grimbert leads EDF Energies Nouvelles in North America, which includes EDF Renewable Energy, EDF EN Canada and EDF EN Mexico. His tenure at the firm started in 2004, and he was elevated to chief executive in 2008. EDF is now one of the largest developers in North America with 9GW of renewables projects in the US, Canada and Mexico. Of this, 7.5GW of wind projects have already been commissioned, with over 1GW in construction. In May, Grimbert was named chairman of the American Wind Energy Association.

60

LAST YEAR: 94



Ward Thomas *President & CEO, Sentient Science*

Thomas set up Sentient Science in 2001 and has pioneered the use of its systems in the wind sector. He launched the firm with US Government backing to use materials science to predict machinery failure rates, and its systems took ten years to develop. It went commercial in 2014, and now works with the likes of Acciona, Duke Energy, EDF, Longyuan and NextEra. To date, its systems are used on 18,000 turbines in 200 wind farms totalling 25GW. In July, it raised \$22.5m from Georgian Partners; and, in October, linked up with Duke Energy to cut maintenance costs in its 4GW portfolio. *Read our interview with Ward Thomas on page 22.*

59

NEW ENTRY



Peter Damgaard Jensen *CEO, PKA*

Jensen has led Danish pension fund manager Pensionskassernes Administration since 2001, and was an early mover in offshore wind in 2011. PKA is Denmark's fourth-largest pension fund with over €30bn of assets, and has invested around €1.5bn so far in five offshore wind projects. Its first was in a 20% stake in the 200MW Anholt, and since then has invested in the Burbo Bank Extension, Butendiek, Gemini and Gode Wind 2 schemes – though it sold its 22.5% stake in Butendiek last year to a consortium led by Japanese investor Itochu.

58

NEW ENTRY



Patrick Lemaire *CEO & President, Boralex*

Under Lemaire's leadership, Canadian developer Boralex has had a busy 12 months as it has completed its 230MW Niagara Region wind farm, and pushed other schemes forward. It also sold a 17.3% stake in the business to La Caisse de depot et placement du Quebec in July for \$230m. Boralex is a leader in the Canadian market and has a major presence in France; and formed a 325MW onshore wind joint venture in the UK with Infinergy in October. Lemaire joined the business in 2006 having previously worked at packaging firm Norampac, where he managed eight mills in Canada, France and the US.

57

LAST YEAR: 66



Michael van der Heijden *Founder & Co-Owner, Amsterdam Capital Partners*

Two years ago, van der Heijden led the team that raised €2.8bn for the financial close of the 600MW Gemini offshore wind farm in the Dutch North Sea, which completed this May. He then led the 396MW Merkur project in the German North Sea to its financial close last year. This involved structuring, negotiating and putting in place a €1.8bn debt and equity package in under a year. This deal has brought new investors to offshore wind sector, as the equity consortium includes Partners Group (50%) and InfraRed Capital Partners (25%).

56

RE-ENTRY



Keith Anderson *CEO, Scottish Power Renewables*

Anderson is chief corporate officer at Scottish Power, part of Spanish group Iberdrola, and CEO of Scottish Power Renewables. In this capacity he is in charge of the utility's activities in the UK, including its £15bn investment plan in 2020, and has this year committed to building more schemes in Scotland. The company is also involved in the 1.5GW Kitty Hawk and 1GW Vineyard offshore wind projects in US waters with Iberdrola's US subsidiary Avangrid; and Anderson has been a vocal critic of the UK Government's hostility to onshore wind farms, which has contributed to his re-entry to the Top 100 this year.

55



LAST YEAR: 81

Mike Garland *President & CEO, Pattern Energy*

Garland is president and CEO of Pattern Energy, and also CEO of group company Pattern Development. This year, Pattern has raised \$724m from institutions for a \$1bn plan that aims to double the size of its renewable energy portfolio to 5GW by 2020. As part of this plan, Pattern Development acquired the 103MW Willow Creek wind project in South Dakota and the 80MW Vivaldi Springtime wind scheme in Montana. The firm is also looking to grow its presence in Japan, where it this year unveiled plans for a 126MW scheme in Amori prefecture.

54



NEW ENTRY

Yann Dumont *CEO of Wind & Solar, Forestalia*

Former Abengoa director Dumont joined Spanish developer Forestalia in March 2016, and has helped the company to make a big impact in the wind sector over the last 12 months. Forestalia won backing from the Spanish government in a 3GW renewable energy auction in May to develop a 1.2GW wind farm with General Electric in Aragon in northeast Spain. This follows the 408MW backing that Forestalia won in the government's 2016 tender. Forestalia was only established six years ago, but Dumont is helping it to punch above its weight.

53



LAST YEAR: 53

Adil Rahmathulla *Partner & Co-Founder, I Squared Capital*

Rahmathulla worked at Morgan Stanley before co-founding US-headquartered private equity investor I Squared Capital in 2012. I Squared focuses on infrastructure, including renewables, in North America, Europe and key emerging markets, with an energy portfolio of 4.3GW in 15 countries. In 2015, it invested in Lincoln Clean Energy, and last year paid €1bn for Irish utility Viridian, which has a 1GW wind portfolio. I Squared was reportedly among bidders for Equis's renewables business, though Global Infrastructure Partners is set to conclude a \$5bn takeover in early 2018.

52



LAST YEAR: 54

Dominik Thumfart *Head of Infrastructure & Energy, Deutsche Bank*

Thumfart is head of infrastructure and energy in the debt capital markets and treasury solutions EMEA division of this German bank's corporate and investment side. Thumfart leads on the origination of infrastructure and energy-related project and structured finance opportunities. He has been involved in the financings of the 600MW Gemini and 402MW Veja Mate offshore schemes, which have been both commissioned this year. In 2016, his team arranged €3.9bn in project finance transactions for renewable developments of over 3.5GW.

51



LAST YEAR: 50

Lucy Heintz *Partner & Head of Renewables, Actis Investments*

Heintz is a partner and head of renewable energy at private equity firm Actis, which gets involved exclusively in the emerging markets of Africa, Asia and Latin America. Two years ago, her team linked up with Mainstream Renewable Power to form pan-African investor Lekela Power with the aim of securing a 900MW wind and solar development pipeline by 2018, but it has already reached 1.3GW. Actis also teamed up with Mainstream on Chile's Aela Energia, and with Mesoamerica Investments on Mexico's Zuma Energia. Six months ago it set up a second vehicle in Brazil, called Echoenergia, for which it bought two wind farms totalling 346MW.

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Burning need: Predicting failures helps cut costs and avoid disasters

Source: Dominique Leppin

MATERIAL CHANGE

Richard Heap spoke to Ward Thomas, CEO at Sentient Science, about how materials science could help make wind 13% cheaper

What does Sentient Science do?

We began developing technology to decode the material genome, similar to what was done with the human genome, 16 years ago and use that to predict failure rates of machines.

We founded the firm in 2001 and have had more than \$70m of investment: \$30m came from the US Government's Defense Advanced Research Projects Agency (DARPA). We took ten years to invent the technology and NASA validated it in early 2011. Then we raised \$17m in venture funding from TOBA Capital in 2016, and \$22.5m from Georgian Partners this July. Now we're sprinting to an initial public offering.

What were you doing before?

In the dotcom era, I helped to build a business that digitalised stock-keeping units. That was Aspect Development

and we sold it in 2000 to i2 for \$9.8bn on \$100m revenue. It's still the highest multiple in the history of software.

Is Sentient a data science firm?

Our models are based on a materials science approach. We combine our prognostic models with data science to provide our customers with the most accurate prediction of when and where failures will occur in their fleet.

Data science alone will not lower the cost of energy, because when a sensor goes off, it's too late. It's telling you it's already failed. We know that deep down in the material, years before the sensor went off, that damage has initiated.

There are many big data solutions on the market. The deep understanding of materials and how materials fail is what sets us apart. Our value is predicting

that in five years a failure will happen, enabling the owner to manage the technology so it runs for 30 years.

How does wind fit into this?

We entered wind in 2014. This is the first sector where we have used the technology commercially. We think operators can make savings equal to 13% of revenue – or \$10/MWh on an \$80/MWh power purchase agreement – and we are now delivering 2%-3% savings by focusing on gearboxes, so we're about one-fifth of the way there. We've just added main bearings, and early next year we're adding generators, so we're going across the turbine.

Currently, 25,000 wind turbines use our technology. By successfully delivering to our current customers, and without adding any additional customers, we'll be at nearly 100,000 wind turbines.



Material difference: Ward Thomas took Sentient Science into wind in 2014



I met Donald Trump in 1991 in New York City at Trump Tower. I remember him saying: ‘Think big.’



Who are your key customers?

We’re a trusted third party to wind operators, but it’s important that suppliers and operators work closely in order to drive down the cost of energy.

We are working with some of the largest wind operators in the world, including Acciona Energia, Duke Energy, Dong, Longyuan in China, NextEra and EDF. We help them extend the life of their wind turbines and make purchasing decisions on billions of dollars of aftermarket products and when they buy new wind turbines.

Our operator customers are building a moat by requiring their suppliers to use DigitalClone to understand how their products will perform in the field. With the insanely low PPAs we’re seeing, it is tough to make money without the visibility that we provide about the next 30 years of cost.

We are also working with suppliers – Vestas, GE, Siemens Gamesa, Moventas – who we help substantiate new product designs to the operator community.

But why target wind first?

Our technology is transferable to any industrial equipment. We could have initially commercialized in aerospace, after all of the work we completed with the U.S. Department of Defense. It was there where we were validated against physical testing. However, in 2012, Clipper Windpower machines were failing at an unprecedented rate, and we saw a huge opportunity to validate

our approach against live machines.

Once we got into wind, we fell in love with it. To lower the cost of energy so our children can breathe clean air, and to make it equal to fossil fuels. We’re very proud to be doing our bit.

At IPO, we’ll continue our work in aerospace, rail and wind energy, then expand to other industries. We want to make sure that the electrification of transportation happens.

Are you growing outside the US?

We’re in China, northern Europe and the US. China accounts for about 20% of our revenue, and the rest is split pretty evenly between the US and Europe.

We recently hired Alfonso Faubel from Alstom GE to be president of Europe, and we love working with this guy. He’s got a ton of energy. In Europe, we set up in Spain first because there are more big operators there than in any other country, and we will open a Hamburg office for the suppliers in Germany.

Our head office is in Buffalo, New York. It’s an hour and a half outside Toronto, and I’m Canadian, so that allows me to be close to my family and our markets.

How big is the team now?

We have about 60 and are growing to 130. We had \$4m revenue in 2016. In 2017, we’ll do \$10m, and then \$20m next year. I personally interview every person in the company, and I want to make sure these people are excited

as I am to work for an extraordinary company, making renewable energy efficient for all of us.

How is Trump affecting this sector?

It’s all positive. I met Donald Trump in 1991 in New York City at the Trump Tower as part of my schooling. I was able to spend a couple of minutes with him – a very smart man – and I remember him saying: “Think big.” That was always his saying back then.

Like most people, I have been horrified by some of the things he says. But, when it comes to wind, to me what he’s really saying is: “Make wind turbines equal to the cost of fossil fuels and this is a no-brainer for me.” He knows we need to produce a whole bunch of electricity for manufacturing to come back to the United States.

We’ve always had Congressmen telling us: ‘Drive down the cost of energy. You do that and it’s going to be an easy choice for companies to make to go to renewable sources versus coal.’ We’re fine with that.

Did you expect Trump to win?

I had no idea. I went to bed that night expecting Hillary and Bill Clinton to be in the White House. My wife woke me at 3am and said: ‘You’re not going to believe this but Trump’s the president.’

I wasn’t expecting that, but I think everyone overreacted as to what that means for wind energy. I see it as a positive not a negative. ■

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professionals
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countries covered
across 5 continents

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wind power
financed

100+
clients
advised in 2016/17

4,857
green giraffes
given away

2017

Top 100 Power People
represented in the top
third for 6 years running

FT/Statista Top 1000
ranked in first third amongst
EU growth companies

Women's Power List
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EUR 15 bn
debt raised

EUR 4 bn
equity raised

EUR 4.2 bn
value of transactions closed in 2017



50

NEW ENTRY



Sacha Kamp *Head of Renewable Energy, Sumitomo Mitsui Banking Corporation*

Kamp may not enjoy the same profile as other investors in the sector, but has played a vital role as the Japanese bank has built its presence in Europe, the Middle East and Africa in the last three years. He is highly active on both the lending and advisory side of both offshore and onshore wind. His highlights of the last two years include his involvement with financing the 396MW Merkur offshore project; backing the 89MW Al Fujeij scheme onshore wind farm in Jordan; and Gulf of Suez in Egypt. He was previously at BNP Paribas and BayernLB.

49

LAST YEAR: 40



Torben Möger Pedersen *CEO, PensionDanmark*

Pedersen remains an influential advocate for wind in the global pension fund sector. In March, PensionDanmark committed DKK4bn (€540m) to the fourth fund of Copenhagen Infrastructure Partners. PensionDanmark has made a total investment commitment of DKK18bn (€2.4bn) to CIP's funds, with the aim of increasing investments in green energy-related infrastructure in the US and Western Europe. Through its Danish Climate Investment Fund, Pedersen's team also invested in the 310MW Lake Turkana wind project in Kenya.

48

LAST YEAR: 44



Justin DeAngelis *MD, Denham Capital*

DeAngelis joined Denham Capital in 2007 and leads the private equity firm's power team. Denham's investee companies include South Africa's BioTherm Energy, which has a 437MW wind and solar portfolio, and a 1.5GW project pipeline; Jenner Renewables, which Denham linked up with in 2015 to invest in renewables in new markets; Nexif Energy, which is set to develop 326MW of wind and hydro projects in southeast Asia, where it has a 1.5GW project pipeline; and Brazilian wind power platform Rio Energy.

47

LAST YEAR: 67



Richard Nourse *Managing Partner, Greencoat Capital*

Nourse leads the investment strategy at Greencoat Capital, whose Greencoat UK Wind was the first listed wind fund when it launched in 2013. Its portfolio is made up of 24 wind farms, with total capacity of 617MW and gross asset value of £1.3bn. In March, Greencoat entered the Republic of Ireland by buying two wind farms totalling 138MW for its new subsidiary Greencoat Renewables, which raised €270m in July through a listing on the London Stock Exchange's AIM market and the Irish Stock Exchange. Now Greencoat UK Wind is looking to issue 500million new shares in the next year to pursue further investment opportunities.

46

NEW ENTRY



Steve Lockard *President, CEO & Director, TPI Composites*

TPI Composites became the world's largest independent blade manufacturer in April as General Electric concluded its €1.5bn buyout of LM Wind Power. Lockard joined TPI in 1999 from GPS supplier Satloc, and became its president and CEO in 2004. TPI is headquartered in US state Arizona and has secured key overseas transactions in the last year including long-term deals with Siemens Gamesa in Turkey; with Vestas in Latin America; and with Senvion in Asia-Pacific and Latin America. It has forecast billings of up to \$950m in 2017.

45

LAST YEAR: 52



Sachin Shah *CEO, Brookfield Renewable*

Shah joined Canadian investment group Brookfield Asset Management in 2002 and is now senior managing partner at the company, as well as CEO of its renewables investment arm. This year, the company has bought a 20.3% stake in Brazilian developer Renova and is now looking to become majority shareholder; and also plans to buy SunEdison yieldco TerraForm Global for \$787m. In October, it grew its stake in fellow former SunEdison yieldco TerraForm Power to 51% for \$622m. Brookfield has also sold two projects totalling 137MW in the Republic of Ireland to Greencoat Renewables.

44

NEW ENTRY



Jérôme Deflesselles *Head of Renewable Energy (Europe), Société Générale*

Deflesselles joined Société Générale in 1995, and worked in real estate structured finance and corporate finance for his first ten years at the French bank. He then came back to the structured finance department in 2004 to set up SocGen's renewable energy team. The bank has a strong reputation in the wind sector, and has continued to be very active offshore: it was involved in all completed project financings in European offshore wind in 2016, including at the 588MW Beatrice, 402MW Dudgeon and 396MW Merkur.

43

LAST YEAR: 57



Hans Bünting *COO of Renewables, Innogy*

Bünting is chief operating officer of renewables at Innogy, which was spun out of German utility RWE as a standalone company in April 2016. It was previously subsidiary RWE Innogy. The new firm was valued at €20bn as it listed 25% on the Frankfurt stock exchange in September 2016, raising €5bn. It already has 3.7GW of renewables capacity in operation, including 107 onshore wind farms and offshore schemes such as the 336MW Galloper and 332MW Nordsee 1. RWE is now reportedly considering selling a 26% stake in Innogy.

42

LAST YEAR: 64



Juergen Geissinger *CEO, Senvion*

Geissinger joined German manufacturer Senvion as chief executive in 2015, and this year led a restructuring plan that is set to involve hundreds of redundancies and two factory closures. Geissinger said this was necessary to secure the firm's financial future, and follows its €1bn buyout by Centerbridge Partners in 2015. This year, Senvion has grown its presence in Australia with orders totaling over 700MW; and has signed a cooperation agreement with German utility EnBW for projects totalling several hundred megawatts in Germany.

41

NEW ENTRY



Dirk Gusewell *Head of Renewable Energies, EnBW*

EnBW made headlines in Germany's first offshore wind auction in April as it won the right to build its 900MW He Dreiht project with no government subsidy, and was the largest winning project to do so. Gusewell is head of renewable energies at the German utility, and said that its bid was based on factors including electricity prices, new technology and capital costs. The utility also this year committed to build the 112MW Albatros offshore project by 2019 and sold a 49.9% stake of the scheme to Enbridge. This deal followed the purchase by Enbridge of 49.9% of EnBW's 497MW Hohe See in February.



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LAST YEAR: 29



Dan Revers *Co-Founder & Managing Partner, ArcLight Capital Partners*

Revers co-founded US private equity firm ArcLight in 2000 and has 28 years' experience of investing in energy. While not a specialist renewables investor, ArcLight has gained the wind industry's attention over the last three years as its start-up portfolio firm Leeward Renewable Energy has concluded deals in the sector. In 2015, it bought the US wind assets of Australian firm Infigen for \$273m; and last year took full control of the 301MW Cedar Creek 1 wind farm in Colorado as it bought BP's one-third stake. ArcLight closed its latest energy-focused private equity fund in 2015 with commitments of \$5.6bn.

39

LAST YEAR: 41

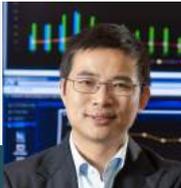


Tulsi Tanti *Chairman & MD, Suzlon*

Tanti has spent the last five years rebuilding this Indian manufacturer after running up big debts on growth plans outside its home market. He is also hoping to get the company up from a 26% share of the Indian wind turbine market in 2016 to the 50% it once enjoyed; and is focusing overseas expansion on the US. The firm this year announced the liquidation of its Brazilian subsidiary, established in 2006, to exit that market. In total, Suzlon has achieved 17GW of turbine installations globally launching in 1995, with 10GW in its home country.

38

LAST YEAR: 28



Lei Zhang *Founder & CEO, Envision*

Lei founded Envision in 2007 and over the last decade this Chinese firm has established itself as one of the largest manufacturers in its home market. Envision now operates on four continents and installed over 1.9GW of its turbines last year, mostly in China. To boost its presence in Europe, Lei plans to invest about \$1.1bn on acquisitions and partnerships between 2016 and 2020; and so, in 2016, it acquired Velocita's French onshore wind business, including its 500MW project pipeline. In July, Envision partnered with firms including Microsoft and Accenture to create a global digital network for renewables, utilities and customers.

37

NEW ENTRY



Antonio Cammisecra *CEO, Enel Green Power*

For the last three years, this Italian utility has been represented in the Top 100 by Francesco Venturini, who was ranked number three last year. However, Venturini was appointed head of Global E-Solutions at Enel in May, and has been succeeded in the renewable energy role by Cammisecra, who joined Enel in 2003 and was head of global business development from 2013 to 2017. His worldwide experience will be invaluable as Enel owns 8GW of wind farms globally, of which 2GW were completed in 2016. These include the 400MW Cimarron Bend in US state Kansas, which completed in March and is Enel's largest wind farm.

36

LAST YEAR: 42



Carol Gould *Head of Power & Renewables (EMEA), MUFG*

Gould joined Bank of Tokyo-Mitsubishi, part of Mitsubishi UFJ Financial Group, in 2000 when a six-strong team moved over from NatWest. Under her leadership, the renewables team at MUFG has participated in a wide range of schemes including the project finance consortium for the 573MW Race Bank, where Macquarie bought 50% of the project from Dong Energy (now Ørsted) for £1.6bn in December; the financing group for the 370MW Norther; and provided construction financing for the 253MW Amazon Wind Farm Texas. In August, MUFG led a Japanese consortium to acquire a 60% of a 223MW wind portfolio in the Republic of Ireland.

35

LAST YEAR: 34



Wolfgang Bischoff *Head of Equity, Energy Finance, Siemens Financial Services*

Bischoff has worked for the banking arm of Siemens for over 15 years, and is involved in many of the largest project financed offshore wind farms out there, investing between €100m and €1bn in each. This year, it has seen its investee projects including the 600MW Gemini and 402MW Veja Mate reach completion; and the 336MW Galloper scheme is due to be operational next year. Siemens Financial Services is also part of the group behind the 600MW Kriegers Flak scheme; and was involved in the €950m refinancing of the 288MW Butendiek.

34

LAST YEAR: 58



Jeffrey Grybowski *CEO, Deepwater Wind*

Grybowski is a leading figure in the nascent US offshore sector having completed the first project in US waters, the 30MW Block Island, in January. This year, the firm has sought to prove it is not a 'one-hit wonder' and, in January, won backing from New York Governor Andrew Cuomo for its 90MW South Fork scheme off Long Island. It was not all plain sailing, though, as the Long Island Power Authority turned down a plan for a 210MW scheme in July, but Grybowski is still looking to develop 1GW of offshore wind for New York and New England.

33

LAST YEAR: 62



Isabelle Kocher *CEO, Engie*

Kocher took over as chief executive of French utility Engie in May 2016 and is leading its three-year transition to low-carbon energy sources. Engie currently owns wind farms with total headline capacity of around 4.5GW, of which around 1.7GW is in France. To bolster its presence in France, in last year the business bought 51% of developer Maia Eolis, to take its stake in the company to 100%; and in April it agreed to acquire the 41% of French wind developer La Compagnie du Vent that it did not own. In July, it bought a 23% stake in the 950MW Moray East offshore wind farm in UK waters, which won government backing in September.

32

LAST YEAR: 38



Irene Rummelhoff *EVP for New Energy Solutions, Statoil*

Rummelhoff has been at this Norwegian utility since 1991. She took over as head of its new energy solutions business area in 2015 which, in wind, is focused on offshore. In September 2016, Statoil agreed to double the size of its stake in the 4.8GW Dogger Bank zone and 317MW Sheringham Shoal wind farm in UK waters to 50% and 80% respectively by buying stakes from Statkraft. Meanwhile, in December, Statoil won a \$42m bid for the right to build an up-to-800MW wind farm off the coast of New York; and it has recently completed the €200m Hywind floating offshore project in waters off Scotland.

31

NEW ENTRY



David Giordano *Head of Renewables (North America, APAC & LatAm), BlackRock*

Giordano has two decades' experience in energy and joined BlackRock, where he is head of renewables for the Americas and Asia-Pacific, in 2011. Giordano made headlines in July as BlackRock Real Assets completed a final close for its Global Renewable Power II fund, after gaining financial commitments of \$1.65bn from 67 institutions. Giordano is portfolio manager of GRP II, of which 20% is invested in five wind and solar farms in the US, Norway and Japan. BlackRock has invested in 100 wind and solar projects globally since 2012. *Read our interview with David Giordano on page 16.*



Big deals: Jens Tommerup joined Vestas in 2009 to head its Chinese operation

SIZE MATTERS

MHI Vestas CEO Jens Tommerup meets Richard Heap to discuss larger turbines, zero-subsidy projects and new markets

“Eventually there will come bigger turbines and, from a technology point of view, it is not impossible. We can make bigger turbines. The question is whether there is a business case.”

This might seem like a strange concern from Jens Tommerup, chief executive of MHI Vestas. The firm he runs has made a business out of building ever-larger machines, from the record-breaking 8MW turbines installed at the 258MW Burbo Bank extension that was completed in May, to the 9.5MW platform launched in June. It has since won orders for the 9.5MW at

the 860MW Triton Knoll and 950MW Moray East. Bigger has been better.

On a recent trip to London, Tommerup met up with A Word About Wind to discuss whether MHI Vestas’s approach to building ever-larger turbines might change. He says it only makes sense to build a turbine of larger than 9.5MW if businesses in the supply chain can cope. A 13MW-15MW turbine could even be taller than London’s tallest building, the Shard, and moving them would be a huge technical challenge.

He says: “Is the industry ready to lift 500-700 tonnes 120metres up in

the air? Are there ships? Are there harbours? Is the industry ready, and is there a compelling case for having bigger turbines coming into the offshore market? We are questioning this a little bit.”

Tommerup argues that there might be other technological innovations to boost the energy yield of offshore turbines without having to keep making them larger. He also discusses the emergence of low- and no-subsidy offshore wind projects in the UK and Germany over the last six months; the firm’s plans for emerging offshore markets; and his background in wind.

Talking turbines

The development of larger and more efficient turbines is one of the most important factors that companies have taken into account when bidding in competitive auctions for subsidies.

In April, the German government gave support for EnBW's 900MW He Dreiht and Dong Energy (now Ørsted) duo Borkum Riffgrund West 2 and OWP West, each 240MW. All three are due to complete by 2024.

The UK Government followed this in September as it gave support under its Contracts for Difference regime for the 1.4GW Hornsea 2 and 950MW Moray East at strike prices of £57.50/MWh. The developments are due to be commissioned by 2023.

At the time of the German auction, Ørsted's head of wind Samuel Leupold said the firm had based its zero-subsidy bids on the notion that 13MW-15MW turbines would be around by 2024.

Tommerup is more circumspect and says the industry has aligned around the idea that these low- and zero-subsidy developments are viable with 10MW turbines.

But he adds that there could be better ways to produce more powerful turbines rather than simply make existing ones larger: "As an industry we have to question ourselves whether there is a different or smarter business model to do this, and that is what we are looking into a lot now. Is it just scaling up and scaling up?" he says.

Tommerup says he has not yet reached any conclusions, but suggests that larger turbines could look different than those around now.

He says: "You have to look at the operational turbine over 20 years or longer, and then you also have to question how could they be designed? Maybe they will not look exactly like the ones we have today. We don't have any more specific information. We are just questioning ourselves because building a bigger turbine, if it's just a question of money, we could do."

MHI Vestas was set up in April 2014 as a joint venture between two industrial giants: Danish turbine manufacturer Vestas and Japanese conglomerate Mitsubishi Heavy Industries. Over 2.5GW of its turbines have been installed in 21 projects, both in its MHI

Vestas years and as Vestas before that. It makes its turbines in-house at factories in the Isle of Wight and Belfast, as well as in Denmark, and does so separate from the onshore supply chain.

Tommerup says this latter point is crucial as it means MHI Vestas can be more flexible when it comes to future designs. He adds its commitment to the UK has not changed with Brexit.

"We are looking at what is actually going to happen with Brexit, but we have decided not to make that a major discussion," he says. "We believe in the UK market and we support the UK market, and we are also exporting main components out of the UK, so the UK facility is now the lead facility from a technology point of view."

He says the result of the Contracts for Difference auction in September was a big plus too. In total, three projects totalling 3.2GW won support, and MHI Vestas has picked up orders at two of them: Innogy and Statkraft's 860MW Triton Knoll, and EDP Renovaveis and Engie's 950MW Moray East.

Tommerup also welcomed the UK's announcement last month it would make £557m of support available for its next set of Contracts for Difference auctions, where the first is due in spring 2019, and the government's pledge to develop offshore wind farms of 10GW or more in UK waters in the 2020s in its Clean Growth Strategy. This has given the market certainty over capacity.

He says: "We want to be part of bringing offshore wind to be a mature industry like automotive or other industries, and to do that we need certainty and pipeline. Then we, as an industry, believe that we can even further reduce the levelised cost of energy."

Industrial experience

Tommerup worked in a range of industries before entering wind eight years ago. He started his career in the merchant navy and then worked as a naval architect before joining Danish coatings firm Hempel in 1985. It was here he gained his first experience with wind turbines.

"I went into the chemicals industry and I was a supplier for some of the first turbines, and I always found it very



Heavy load: A crane lifts a blade into place for an MHI Vestas turbine



Offshore wind in the future will be a much more important part of the energy mix... We have plenty of room to grow.



interesting,” he says. He rose through the ranks to become managing director of the Hempel’s Japanese operations, before moving to the firm’s Chinese arm and spending ten years as its chief executive. During this time, he says the company worked on coatings for 80% of wind turbine towers used in China, and he knew all the main suppliers.

In 2009, Tommerup joined the Chinese operation of Vestas and ran it for three years before merging it with the Danish manufacturer’s Asia-Pacific arm. In October 2013, he took over as head of the company’s offshore arm, which has now become the CEO role at MHI Vestas. He adds that his 15 years’ experience of working in joint ventures has also proved useful.

Tommerup’s work in the chemicals industry put him in contact with many sectors, but he says he has never seen any develop as fast as offshore wind has in the last four years. How far does he expect the offshore wind industry to grow in the next five years?

“Offshore wind in the future will be a much more important part of the energy mix... Today, in Europe, offshore wind is 3% of the electricity production, and if you increase that to 10% then it’s tripling wind. If you even get to 30%, which I believe for sure is possible.... we still have plenty of room to grow,” he says.

Tommerup adds that connecting European energy markets with more interconnectors would help to support expansion of offshore wind.

He says the sector should also look at building larger offshore wind schemes, with headline capacity of up to 5GW each. This could help to drive faster industrialisation, and it does not mean that all of that 5GW would need to be delivered by one developer. This could include clusters of offshore developments that are pursued jointly by neighbouring countries.

And growth is not reliant on areas that need floating turbines. He says there are still plenty of opportunities in areas that can use fixed foundations.

“I believe in floating and, from a technology point of view, we have already had floating turbines for more than three or four years... but floating has to mature,” he says. “We have to have joint technical standards how to build foundations, and then we really will be able to drive down the cost.”

New markets

Outside Europe, MHI Vestas is priming itself for expansion in North America and Asia, and Tommerup says it is “more optimistic about the US than we were just six months ago”.

One of the main reasons for this is that the US Government axed plans in May to tighten up its Jones Act. The act sets the conditions by which services in its waters would need to be delivered by US-built and US-flagged vessels. The government was planning to revoke past rulings that allowed non-US vessels to carry out some services, which would have restricted firms operating in the offshore wind sector.

However, the US Government has axed the planned revisions. Tommerup says there are questions about how to work within local content rules and build a local supply chain, but adds that MHI Vestas is working with several clients on US projects, and so the market is a “tick in the box”. The company is set to open a first US office in 2018.

Taiwan faces similar infrastructure challenges, predominantly ports, but Tommerup says firms are getting “more and more clarity”. The company is also looking at Japan, which is no surprise given that the ‘MHI’ part of MHI Vestas is a Japanese giant. The growth of these markets depends in part on how firms can export knowledge from Europe.

For manufacturers, this means ensuring they work closely with developers. This is becoming more important in Europe with the move to competitive auctions, where manufacturers have to work closely with developers to bring down the cost of energy. Tommerup explains: “This is one of the things I learned many years ago which I have, I think, been able to bring in to this, and why the collaborative model has been quite successful in the last CfD round.”

There will be bigger turbines, but only if they are cost-effective. That is more important than size for the sake of it.

“It’s very important that we link to the customer’s business case. It is not only that it’s bigger or a more beautiful machine,” says Tommerup. “It has to create value for the customer and society. That’s really the goal.” ■

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LAST YEAR: 26

Hans-Dieter Kettwig *MD, Enercon*

There has been change at the top of this German manufacturer in the last year as Hans-Dieter Kettwig became sole managing director in January after the departure of Nicole Fritsch-Nehring. Despite this, Enercon installed 3.8GW of turbines globally in 2016, up 23% year-on-year, and Kettwig has forecast 4GW of installations this year. The introduction of competitive auctions in Germany could curtail opportunities for Enercon at home and force it to expand globally: it is reportedly plotting a return to India but ruled out expansion in the US or offshore.

29



LAST YEAR: 30

Eddie O'Connor *Executive Chairman & Co-Founder, Mainstream Renewable Power*

Under O'Connor's guidance, Mainstream has continued to secure major deals in emerging markets this year. The company has almost 10GW of renewables capacity in development or construction, and 524MW in operation. In June, Mainstream finalised the deal with GE Renewable Energy to work on the 800 MW Phu Cuong Wind Farm in Vietnam. It is also working with Taiwan's Pacific Corporation on schemes totalling 138MW. Meanwhile, in Europe, it won a court battle over its 450MW Neart na Gaoithe offshore project and has been mulling a plan to sell it.

28



LAST YEAR: 33

William Fehrman *President & CEO, MidAmerican Energy Company*

Fehrman joined Warren Buffett's Berkshire Hathaway Energy in 2006 to lead the integration of PacifiCorp into the firm after a \$5.1bn buyout; and is now president and chief executive of its subsidiaries MidAmerican Energy and BHE Renewables. The firm has installed 4GW of wind capacity to date and this year started work on the 170MW Beaver Creek and 168MW Prairie projects, which are the first phases of its \$3.6bn 2GW Wind XI scheme in Iowa that is due to complete in 2019. MidAmerican aims to get 65% of its energy from wind in 2017.

27



LAST YEAR: 25

Jérôme Guillet *MD, Green Giraffe*

Guillet is a highly respected name in wind energy finance, with a team that has worked on notable offshore fundraisings including €2.8bn for the 600MW Gemini and €1.9bn for the 402MW Veja Mate. Both were commissioned this year. Under his leadership, Green Giraffe has this year worked with Elicio, Eneco and Diamond Generating Europe to raise €1.2bn for the 370MW Norther; on a €591m debt financing for Trianel Windpark Borkum II; and helped Northland Power to reach a €1.3bn financial close for its newly-acquired 252MW Deutsche Bucht. The firm has also worked in large onshore projects, including the 309MW Hornsdale in Australia.

26



LAST YEAR: 32

Antoine Cahuzac *CEO, EDF Energies Nouvelles*

Cahuzac took over as chief executive of EDF Energies Nouvelles in 2012 after holding senior roles at corporates including HSBC. EDF EN has a renewables portfolio of 10.4GW, of which wind farms represent 9.1GW, and it carries out operations and maintenance on a portfolio of 13.3GW. EDF has new renewables projects underway in nations including Brazil, Chile, China and India; and has also bolstered its operations in the last year with corporate M&A deals, including its acquisition of developer Futuren and O&M firm Offshore Wind Solutions.

25



NEW ENTRY

Ivor Catto *CEO, RES Group*

Catto stepped into big shoes as CEO of RES Group in October 2016 after wind sector legend Ian Mays retired from day-to-day operations after 36 years to sit on the supervisory board, which oversees RES and other McAlpine family businesses. Catto joined RES last year after seven years at design and engineering firm Hyder Consulting, most recently as CEO, which worked on Dubai's Burj Khalifa skyscraper. RES has a 12GW renewables portfolio globally, including onshore and offshore wind farms, and 2GW of asset management projects. He has also been named chairman of WindEurope.

24



LAST YEAR: 35

John Brace *CEO, Northland Power*

Brace joined this Canadian developer in 1988, and has served as chief executive since 2005. Northland currently owns stakes of 1GW in operational wind projects and a further 584MW under construction. This includes 60% of the 600MW Gemini offshore wind farm, which was commissioned in May. Northland has also this year formed a joint venture with Singapore's Yushan Energy to develop two offshore wind farms totalling up to 1.2GW in Taiwan; and it has reached a €1.3bn financial close on the 252MW Deutsche Bucht, after buying it from Highland Group. In August, it concluded a year-long strategic review by deciding against a sale of the business.

23



LAST YEAR: 51

Rafael Mateo *CEO, Acciona Energia*

Mateo became chief executive of Acciona Energia seven years ago after 28 years at Endesa, and the business continues to focus on development after Acciona sold its turbine-making arm to Nordex in 2016. Acciona operates around 7GW of wind energy capacity in more than 20 countries on five continents, and has developed almost 1.5GW of wind projects for third parties – but chose not to participate in Spain's recent renewables auctions. He has risen up the Top 100 as Acciona is taking a lead on developing systems to enable wind farms to provide grid balancing services.

22



LAST YEAR: 27

Gunnar Groebler *SVP for Wind, Vattenfall*

Groebler heads the wind operations of Swedish utility Vattenfall, which has more than 1,000 turbines spinning across Europe. Last year, he announced that the utility plans to more than triple the size of its 2.2GW offshore wind portfolio by 2025, and this year split its wind division into separate units for different technologies. Vattenfall's biggest offshore projects include the 600MW Kriegers Flak off Denmark, the 584MW Atlantis 1 that it bought from PNE Wind in January, and the 288MW Sandbank scheme that it commissioned in July. The firm is also active onshore and in September it fully commissioned its 228MW Pen y Cymoedd in Wales.

21



LAST YEAR: 23

Mark Dooley *Head of Infrastructure, Utilities & Renewables (Europe), Macquarie Capital*

Dooley joined Macquarie Capital, an investment arm of Australian bank Macquarie, in 2005 and now leads on its renewable energy deals in Europe. This has been a very important year for Macquarie, which in April finalised its controversial acquisition of the UK Green Investment Bank from the UK Government for £2.3bn. Macquarie has pledged to protect the GIB's environmentally-led mission, while also enabling the green bank to expand overseas. Meanwhile, Macquarie has been active in emerging offshore wind markets, acquiring a 50% stake in the Formosa 1 project in Taiwan's waters from Swancor in January.

20

NEW ENTRY


Ben Fowke *Chairman, President & CEO, Xcel Energy*

Xcel Energy chairman, president and CEO Ben Fowke was paid a reported \$18.5m last year as he led the US utility's expansion in wind. For the last 12 years, Xcel has been the largest utility wind energy provider in the US, with a portfolio of 6.7GW of which most is procured through power purchase agreements. It also owns five wind farms totalling 850MW. Xcel announced two big deals in March, under which it would add 2.7GW to its portfolio: it is planning to develop six wind farms totalling 1.7GW and sign power purchase agreements of 1GW with four more.

19

LAST YEAR: 14


Rory O'Connor *MD, BlackRock & BlackRock Renewable Power (Head of Europe)*

O'Connor is managing director at BlackRock, the world's largest asset manager, and heads renewable energy investments in Europe. This year the company completed a close for its latest renewable power fund, the Global Renewable Power II fund, which raised more than \$1.6bn; and brought in a further £475m for its £1.1bn Renewable Income UK fund, which O'Connor manages. BlackRock has a total invested portfolio of approximately 2.6GW of wind and solar generating capacity across North America, Europe and Asia.

18

LAST YEAR: 22


João Manso Neto *CEO, EDP Renovaveis*

Neto became CEO of EDP Renovaveis in 2014, and runs a wind and solar portfolio of 10.4GW in Europe and the Americas. This year, the company finalised the sale of a 49% stake in a 422MW portfolio of wind assets to a subsidiary of China Three Gorges for €242m, which will enable it to recycle new capital to invest in new projects. In March, parent company EDP, which owned 77.5% of EDPR, made an offer to buy the stake in EDPR that it did not already own. EDP ended up growing its stake to 82.6%, falling short of its target of owning at least 90%. EDPR also won UK support in September for its 950MW Moray East offshore project with Engie.

17

LAST YEAR: 13


Sandy Reisky *Chairman & Chief Strategy Officer, Apex Clean Energy*

Reisky has founded companies that have developed wind and solar facilities worth over \$4bn across the US. He sold his previous wind company Greenlight Energy to BP in 2006, and in 2009 founded Apex Clean Energy. The company has brought nearly 1.7GW of wind capacity online in the past two years and has built a 13GW portfolio of projects. This year the company completed the Fort Hood hybrid complex, which serves the US army, and acquired the up-to-200MW Great Pathfinder project in Iowa.

16

LAST YEAR: 20


Jens Tommerup *CEO, MHI Vestas*

Tommerup is CEO of MHI Vestas and has led the manufacturer to a series of successes this year. The company has continued to pick up large orders, including Dong Energy's 450MW Borkum Riffgrund 2 project in the German North Sea; and the Borssele 3 and 4 projects in the Netherlands, totalling 700MW, which will be developed by a consortium led by Shell. In June, the manufacturer unveiled its plans for a 9.5MW turbine, which is an upgraded version of its 8MW turbine, and has secured the first orders for it at the 860MW Triton Knoll and 950MW Moray East. *Read our interview with Jens Tommerup on page 28.*

15

LAST YEAR: 15


Ray Wood *MD & Global Head of Power & Renewables, Bank of America Merrill Lynch*

Wood has built a reputation as a big dealmaker in US wind thanks to his 27 years of working in investment banking, including over 20 years focused on energy. He spent 22 years at Credit Suisse before joining Bank of America Merrill Lynch in 2012, where he heads global renewables and is now focused on deals including project financings and corporate M&A. This year, his team participated in transactions including a \$365m tax equity deal for the 300MW Rock Creek wind farm. Bank of America Merrill Lynch has a sustainability investment goal of \$125bn by 2025.

14

LAST YEAR: 8


Wu Gang *Founder & Chairman, Goldwind*

Wu is a leading figure in Chinese wind as founder and chairman of the country's largest turbine manufacturer. In 2016, Goldwind installed 6.4GW of turbines, making it the third-largest turbine manufacturer globally by new installations – down from first place in 2015. This fall shows that Goldwind has suffered from the slowdown of the Chinese wind market, where Goldwind gets the vast majority of its orders: its sales in China fell from a record 29GW in 2015 to 22.8GW in 2016. The company has also been working on schemes overseas, and agreed to buy the 530MW Stockyard Hill project in Australia from Origin Energy in May.

13

LAST YEAR: 31


Jim Robo *Chairman & CEO, NextEra Energy*

Robo became president and chief executive of US utility NextEra Energy in 2012, and was elevated to chairman in late 2013. The company is a major player in North America and a key voice lobbying for the wind industry. Robo heads a 13.9GW wind portfolio, owned via subsidiaries NextEra Energy Resources and NextEra Energy Partners. Under his leadership, NextEra is looking to commission up to 5.4GW of wind and solar capacity in North America in 2017 and 2018; and recently agreed to develop 750MW of wind farms for Xcel Energy. In August, NextEra was reportedly among potential buyers of NRG Energy's renewable assets.

12

LAST YEAR: 9


Jakob Baruel Poulsen *Managing Partner, Copenhagen Infrastructure Partners*

Five former Dong Energy employees run this Danish infrastructure investor, which they set up in 2012 with €200m from PensionDanmark and a mandate to invest in renewables in Europe and North America. Led by Poulsen, the team has achieved some high-profile deals over the last year, including the acquisition of three offshore wind sites in Taiwan with potential for wind farms of up to 1.5GW. It also invested in the 197MW Bearkat 1 onshore project in Texas; sold a 50% stake in its Vineyard Wind offshore project in US waters to Avangrid; and raised €1.9bn in a third close for its Copenhagen Infrastructure III fund, launched in March.

11

LAST YEAR: 4


Li Enyi *President & Executive Director, China Longyuan Power*

Li became president of China Longyuan Power in 2013, one of the biggest jobs in wind. Longyuan is the renewables arm of state-run power firm China Guodian Corporation, which makes it the largest wind farm operator in the world's largest market. In 2016, China Longyuan Power built 28 new wind power projects totalling over 1.6GW, to grow its total portfolio to around 17.4GW at the end of March 2017. In May, the company issued €258m of green bonds to fund future project investment and construction projects. However, its share price has suffered as the China has sought to stifle wind's growth due to fears of oversupply and curtailment.

10

NEW ENTRY



Anja-Isabel Dotzenrath *CEO, E.On Climate & Renewables*

Dotzenrath took over as chief executive of E.On Climate & Renewables in April, as Michael Lewis became CEO of E.On UK. E.On Climate & Renewables operates projects totalling 5.3GW globally, including 4.3GW of onshore wind farms in Europe and the US. The firm either owns or is partner in nine offshore wind farms across European waters including the 302MW Amrumbank West in Germany and the 630MW London Array in the UK; and is working on the 400MW Rampion and 385MW Arkona. It is also building two large onshore projects in the US: its 278MW Radford's Run and 228MW Bruenning's Breeze. *Read our interview on page 6.*

9

LAST YEAR: 10



Xabier Viteri Solaun *Director of Renewable Energy Business, Iberdrola*

Spanish utility Iberdrola has spent the last few years growing outside of its home market overseen by Solaun, who has been at Iberdrola for more than 25 years, including 15 years as head of its renewables division. This year, Iberdrola bought a 50% stake in the 1GW Vineyard Wind offshore project in US waters through its US subsidiary Avangrid, which was also given the right to develop an up-to-1.5GW offshore project in the Kitty Hawk zone. Meanwhile, in the UK, where it operates as Scottish Power Renewables, Iberdrola has 30 operational wind farms with capacity of over 1.6GW. It also issued a €750m green bond in September.

8

LAST YEAR: 37



Michael Polsky *President & CEO, Invenergy*

Polsky set up Invenergy in 2001 and has grown it into North America's largest independent wind farm operator. The company has developed more than 16GW of renewables projects, including 77 totalling 10GW in the wind sector. This year, it has unveiled plans to develop the 2GW Wind Catcher wind farm in Oklahoma with General Electric, and closed a \$4.5bn project finance deal with American Electric Power in June. This key deal helped propel Polsky up the Top 100 this year. Invenergy also set up a venture capital fund in June to back digital start-ups; and secured construction financing for its 300MW Santa Rita.

7

LAST YEAR: 1



Jérôme Péresse *President & CEO, GE Renewable Energy*

Péresse joined French manufacturer Alstom in 2010 and headed its renewables operations until late 2015, when General Electric completed its acquisition of Alstom's energy assets for €12.4bn. He has overall control of GE Renewable Energy's onshore and offshore wind operations. In 2016, the firm installed 6.5GW of turbines around the world and increased its global presence to 21 countries from 14 in 2015. In April, GE completed the acquisition of Danish rotor blades supplier LM Wind Power for €1.5bn, which is a key piece of consolidation in the supply chain.

6

LAST YEAR: 2



Anders Runevad *President & CEO, Vestas*

Runevad took over at Vestas in 2013, after the Danish firm issued a series of profit warnings, and has led a turnaround strategy that established the company as the world's largest turbine manufacturer. This secured him first place on the Top 100 Power People two years ago. In 2016, Vestas installed 8.7GW of turbines with projects completed in 35 countries, and picked up orders of 10.5GW. A key factor in last year's growth was a larger number of sales in the US, which accounted for 50% of the firm's total orders. Meanwhile, the value of its service order backlog grew sixfold from €1.8bn to €10.7bn following its acquisition-driven growth drive in recent years.

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5



LAST YEAR: 6

David Jones *Head of Renewable Energy, Allianz Capital Partners*

Jones joined Allianz Capital Partners in 2004 before the firm, which is the alternative asset investment arm of German insurer Allianz, made its first commitment to investing in clean energy schemes. In the last 13 years, Jones has played a key role in helping to establish wind and solar farms as an attractive and low-risk asset class for risk-averse institutional investors.

The company's first funds, Allianz Renewable Energy Partners I and II, invested in Germany, France and Italy, but the company has broadened both its investment locations and investor base through three funds in the intervening years, to include Austria, Finland, Sweden and the US. Its

portfolio of 82 renewables assets is split between 75 wind farms and seven solar parks, and is valued at more than €4.5bn. Jones recently told A World About Wind the firm is now looking at expansion outside the European Union and US, as well as in the offshore sector.

The company's highlights of the last 12 months included a tax equity investment in Pattern Energy's 324MW Broadview complex in the US on the border between New Mexico and Texas in May; its investment of tax equity in EDF's 225MW Great Western scheme in the US in February; and its acquisition of an 80% stake in a 142.5MW portfolio of PNE Wind assets.

4



LAST YEAR: 12

John Eber *MD of Energy Investments, JP Morgan*

It has been a time for cool and experienced heads in the US wind industry over the last 12 months following the election of Donald Trump, the world's highest-profile wind critic, as US president. And, when it comes to US wind finance, there are few that match John Eber.

Eber has been with JP Morgan since 1988, and manages the investment giant's tax equity investments in the energy sector. He manages a 20-strong team and, since 2003, has been responsible for around \$12.8bn of renewable energy tax equity, including financings for more than 14GW of wind power in 122 projects in 22 US states; and is also active in solar and geothermal.

In addition, Eber has been a member of the American Wind Energy Association's board of directors since 2007, and is a key commentator on the financial side of US wind.

He was a wise counsel at the start of 2017 when he forecast that he did not expect any reforms to the phased reduction in the wind production tax credit; and predicted a "healthy active market" for the next few years. Both have come to pass, and his expertise will continue to be in great demand as the Trump administration runs its course.

Read more about the influence of Trump on this Top 100 Power People in our analysis on page 11.

3



LAST YEAR: 7

Markus Tacke *CEO, Siemens Gamesa Renewable Energy*

The takeover of Spanish developer Gamesa by the wind division of German manufacturing giant Siemens concluded in April, and brought to an end the most discussed wind takeover transaction of 2016. Tacke became CEO of the merged Siemens Gamesa Renewable Energy in May after a brief handover from interim CEO Ignacio Martin, who came 11th on the Top 100 Power People but has since exited the merged company – and the wind sector as well.

Tacke now heads a company with annual turnover of around €1.1bn; 70GW of operational onshore and offshore wind capacity around the world; orders worth an estimated €21bn; and around 22,000 employees. Siemens owns 59% of the new company,

Iberdrola 8%, and other investors the remaining 33%. The intention was to merge the experience of Siemens in offshore with Gamesa's nous in emerging markets. This seems to be paying off.

Under Tacke's leadership, the company has recently announced a host of deals including a 752MW turbine order for the Borssele 1 and 2 offshore schemes in July; led a consortium that won support from the Turkish government for a 1GW development; and has secured transactions in countries as diverse as India, Indonesia, Mexico, Norway, Thailand and the US.

It also decided to close former Areva-Gamesa joint venture Adwen in September.

2



LAST YEAR: 5

Samuel Leupold *EVP & CEO of Wind Power, Ørsted*

Leupold has been with Danish utility Ørsted, which was until recently called Dong Energy, since 2013 and heads its wind division. The company re-branded in October to reflect its focus on renewables after selling its oil and gas operations to Ineos for around £1bn – and the business has always been close to the offshore action in 2017.

In April, it won the right to build two projects in Germany's first offshore wind auction with no subsidies on top of the wholesale electricity price: the 240MW OWP West and 240MW Borkum Riffgrund West 2, both of which are due to be commissioned in 2024. This helped totally re-frame the discussion over the costs of offshore wind.

It followed this in September when its 1.4GW Hornsea 2 scheme in UK waters won support from the government at a strike price of £57.50/MWh, which is half the level achieved two years ago. This has put offshore wind at the heart of the UK Government's energy plans.

And this is on top of successes including the 258MW Burbo Bank extension in April, where it plans to install battery storage in an offshore first; selling a 50% stake in Borkum Riffgrund 2 to Global Infrastructure Partners for €1.2bn; and helping open up the offshore wind market in the US and Taiwan. It has been a very busy 2017 for this leading offshore developer, with more to come in 2018.



1

Philip Anschutz *Owner, Power Company of Wyoming*

The worldwide media may have been focused on the exploits of one septuagenarian American billionaire this year, but there is another outside the White House who is really shaking up the wind industry. That is Philip Anschutz, who some have branded the 'anti-Trump' for his low-key manner – and whose backing for wind is vital with President Trump in office.

Anschutz is one of the richest people in the US, with an estimated net worth of \$12bn, and sprawling business interests in which wind plays only a small part. Anschutz owes his fortune to fossil fuels since he took over his father's oil drilling company in the early 1960s, and he has built up an empire over five decades in sectors including entertainment, property, railroads and telecoms. He owns one-third of basketball megabrand the Los Angeles Lakers, for example.

However, as owner of the Power Company of Wyoming, this quiet tycoon has also become an influential supporter of the wind sector, and started construction in April on the up-to-3GW Chokecherry and Sierra Madre wind project on 300,000 acres of land he owns in the state of Wyoming.

This is a high-profile development as it would be the largest onshore wind farm in North America if completed as planned. It is technically ambitious too, as Anschutz's idea is to use it to provide electricity to utilities in California, which is 700 miles away. This is no small feat.

And this is why we see it as so significant. Arguably, the most important story in wind in the last 12 months is the continued strong performance of the industry in the US despite the fact that President Trump derides renewables, particularly wind; seeks to derail the global fight against climate change; and justifies these criticisms with endless talk about his business credentials. US growth is testament to the hard work of over 100,000 people who work in US wind – and high-profile support from magnates like Anschutz acts as a powerful rebuttal to Trump's words.

In the 100th anniversary issue of Forbes magazine, Anschutz forecast that the energy sector is "about to undergo transformational change... driven in part by the rise of renewable clean energy". With individuals like Anschutz going big in wind, other utilities that have traditionally focused on fossil fuels will surely take note.

NEW
ENTRY

Top 100 list

2017 position	2016 position	Name	Company	Title
1	-	Philip Anschutz	Power Company of Wyoming	Owner
2	5	Samuel Leupold	Ørsted	EVP & CEO of Wind Power
3	7	Markus Tacke	Siemens Gamesa Renewable Energy	CEO
4	12	John Eber	JP Morgan	MD of Energy Investments
5	6	David Jones	Allianz Capital Partners	Head of Renewable Energy
6	2	Anders Runevad	Vestas	President & CEO
7	1	Jerome Pecresse	GE Renewable Energy	President & CEO
8	37	Michael Polsky	Invenergy	President & CEO
9	10	Xabier Viteri Solaun	Iberdrola	Director of Renewable Energy Business
10	-	Anja-Isabel Dotzenrath	E.On Climate & Renewables	CEO
11	4	Li Enyi	China Longyuan Power	President & Executive Director
12	9	Jakob Baruel Poulsen	Copenhagen Infrastructure Partners	Managing Partner
13	31	Jim Robo	NextEra Energy	Chairman & CEO
14	8	Wu Gang	Goldwind	Founder & Chairman
15	15	Ray Wood	Bank of America Merrill Lynch	MD & Global Head of Global Power & Renewables
16	20	Jens Tommerup	MHI Vestas	CEO
17	13	Sandy Reisky	Apex Clean Energy	Chairman & Chief Strategy Officer
18	22	João Manso Neto	EDP Renovaveis	CEO
19	14	Rory O'Connor	BlackRock	MD, BlackRock & BlackRock Renewable Power (Head of Europe)
20	-	Ben Fowke	Xcel Energy	Chairman, President & CEO
21	23	Mark Dooley	Macquarie Capital	Head of Infrastructure, Utilities & Renewables (Europe)
22	27	Gunnar Groebler	Vattenfall	SVP for Wind
23	51	Rafael Mateo	Acciona Energia	CEO
24	35	John Brace	Northland Power	CEO
25	-	Ivor Catto	RES Group	CEO
26	32	Antoine Cahuzac	EDF Energies Nouvelles	CEO
27	25	Jérôme Guillet	Green Giraffe	MD
28	33	William Fehrman	MidAmerican Energy	President & CEO
29	30	Eddie O'Connor	Mainstream Renewable Power	Executive Chairman & Co-Founder
30	26	Hans-Dieter Kettwig	Enercon	MD
31	-	David Giordano	BlackRock	Head of Renewable Power (North America, APAC & Latin America)
32	38	Irene Rummelhoff	Statoil	EVP for New Energy Solutions
33	62	Isabelle Kocher	Engie	CEO
34	58	Jeffrey Grybowski	Deepwater Wind	CEO
35	34	Wolfgang Bischoff	Siemens Financial Services	Head of Equity, Energy Finance
36	42	Carol Gould	MUFG	Head of Power & Renewables (EMEA)
37	-	Antonio Cammisecra	Enel Green Power	CEO
38	28	Lei Zhang	Envision	Founder & CEO
39	41	Tulsi Tanti	Suzlon	Chairman & MD
40	29	Dan Revers	Arclight Capital Partners	Co-Founder & Managing Partner
41	-	Dirk Gusewell	EnBW	Head of Renewable Energies
42	64	Juergen Geissinger	Senvion	CEO
43	57	Hans Bünting	Innogy	COO of Renewables
44	-	Jérôme Deflesselles	Société Générale	Head of Renewable Energy (Europe)
45	52	Sachin Shah	Brookfield Renewable	CEO
46	-	Steve Lockard	TPI Composites	President, CEO & Director
47	67	Richard Nourse	Greencoat Capital	Managing Partner
48	44	Justin DeAngelis	Denham Capital	MD
49	40	Torben Möger Pedersen	PensionDanmark	CEO
50	-	Sacha Kamp	Sumitomo Mitsui Banking Corp.	Head of Renewable Energy

Top 100 list

2017 position	2016 position	Name	Company	Title
51	50	Lucy Heintz	Actis Investments	Partner & Head of Renewables
52	54	Dominik Thumfart	Deutsche Bank	Head of Infrastructure & Energy
53	53	Adil Rahmathulla	I Squared Capital	Partner & Co-Founder
54	-	Yann Dumont	Forestalia	CEO of Wind & Solar
55	81	Mike Garland	Pattern Energy	President & CEO
56	-	Keith Anderson	Scottish Power Renewables	CEO
57	66	Michael van der Heijden	Amsterdam Capital Partners	Founder & Co-Owner
58	-	Patrick Lemaire	Boralex	CEO & President
59	-	Peter Damgaard Jensen	PKA	CEO
60	94	Ward Thomas	Sentient Science	President & CEO
61	82	Tristan Grimbert	EDF Renewable Energy	President & CEO
62	-	Marshal Salant	Citi	MD & Global Head of Alternative Energy Finance
63	-	Buzz Miller	Southern Power	President & CEO
64	74	Sumant Sinha	ReNew Power	Chairman & CEO
65	69	Mortimer Menzel	Augusta & Co.	Partner
66	-	Jonathan Taylor	European Investment Bank	VP
67	-	Pieter van Oord	Van Oord	CEO
68	75	Ted Brandt	Marathon Capital	Co-Founder & CEO
69	87	Declan Flanagan	Lincoln Clean Energy	CEO
70	61	Dana Younger	International Finance Corporation	Chief Renewable Energy Specialist
71	-	Mark Gainsborough	Shell	EVP of New Energies
72	-	Lu Chun	China Three Gorges Corporation	Chairman
73	71	Anette Eberhard	EKF	CEO
74	-	Lorna Shearin	RBC Capital Markets	MD
75	56	Nick Gardiner	Green Investment Group	MD & Head of Offshore Wind
76	-	Brandon Prater	Partners Group	Head of Private Infrastructure Europe
77	76	Markus Lesser	PNE Wind	CEO
78	92	Gernot Blanke	WPD	CEO
79	-	Jef Colruyt	Colruyt Group	CEO
80	59	Marc de Jong	LM Wind Power	CEO
81	-	Laura Beane	Avangrid Renewables	CEO
82	-	Jose Luis Blanco	Nordex	CEO
83	84	Steinar Bysveen	Statkraft	EVP for Wind Power, District Heating & Projects
84	-	Kay Dahlke	UKA Group	MD
85	-	Siobhan Smyth	Siemens Bank	Head of Debt, Energy (EMEA)
86	-	Robert Tsai	Swancor	Chairman & CEO
87	-	Chris Brown	Vestas Americas	President, Sales & Service
88	-	Adebayo Ogunlesi	Global Infrastructure Partners	Chairman & Managing Partner
89	-	Laszlo Varsanyi	Enbridge	VP of New Ventures (Power)
90	-	Juliet Davenport	Good Energy	Founder & CEO
91	-	Sue Milton	Royal Bank of Scotland	Senior Director (Energy, Structured Finance)
92	91	Fraser McLachlan	GCube Insurance Services	CEO
93	98	Laura Folse	BP Wind Energy	CEO
94	100	Alla Weinstein	Trident Winds	Founder
95	-	Paul de la Gueriviere	Ideol	CEO
96	97	Alexandra von Bernstorff	Luxcara	Managing Partner & Co-Founder
97	-	Rob Freeman	Tradewind Energy	CEO & Co-Founder
98	-	Emma Tinker	Asper Investment Management	Director
99	-	Nicolas Paul-Dauphin	Eolfi	CEO
100	-	Kari Kautinen	Fortum	SVP for M&A and Solar & Wind Development

NEW FOR 2018

The Top 100 Power People is our final special report of 2017, but we are already well underway with our planning for 2018. This is set to include some exciting new launches.

For the first time, we are due to launch a weekly briefing for the North American

market, a North American Power List, a Financing Wind conference in the US, and Quarterly Drinks in New York. This is on top of the services and events you know and love: three global intelligence briefings each week, reports, Quarterly Drinks, and our annual Financing Wind conference in London.

These will all be accessible for the 2,500 senior executives in the A Word About Wind community. And, if you have not yet signed up, we would love to talk to you about the benefits of membership.

To register for a free 30-day newsletter trial visit: www.awordaboutwind.com

EVENTS

1st March
Quarterly Drinks Q1

May / June
New York Conference

7th June
Quarterly Drinks Q2

6th September
Quarterly Drinks Q3

13th September
US Quarterly Drinks Q3

October / November
London Conference

15th November
US Quarterly Drinks Q4

29th November
Quarterly Drinks Q4

REPORTS

9th January
Finance Quarterly Q1

10th April
Finance Quarterly Q2

29th May
North American Power List

10th July
Finance Quarterly Q3

9th October
Finance Quarterly Q4

13th November
Top 100 Power People

“
The newsletters and analysis are excellent. Concise, easy to read and the best way of staying on top of the market.

”
Henrik Stamer, CEO, K2 Management



Market expertise: High-level discussion at the launch of our Women's Power List in March



Join us for a free introductory
media and messaging workshop.

Email advice@tamarindocomms.com to arrange a meeting.

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A WORD ABOUT WIND

