

A WORD ABOUT WIND

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PPA PARTNERSHIPS

How sub-50MW deals can work for you

In association with



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Networking at A Word About Wind's Women's Power List launch

EDITORIAL



by Richard Heap,
editor at A Word About Wind

“Anyone looking at these kinds of deals has to get to grips with a host of structures. This can be daunting even for those who work in wind every day.”

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Big names. Big numbers. There is no ignoring the fact that we journalists focus on stories with both of them.

That means that when a host of global firms sign contracts to buy electricity from wind farms, we take notice. In the last few years we have seen tech giants Amazon, Apple, Google and Microsoft sign them, as well as General Motors, Ikea, Mars and Walmart. There are benefits of these deals across sectors.

This gives an impression that it is only large companies that can benefit, but that is not the case. Smaller firms are starting to realise the benefits of power purchase agreements (PPAs) with wind farm operators too.

In this report, we have teamed up with renewable energy company Apex Clean Energy to look at some of the ways that firms can go about concluding PPAs of 50MW or less; and how project owners can help secure the deals, which also help their bottom line.

Key benefits include achieving corporate sustainability goals, stabilising electricity costs, and improving the security of energy supply. Some firms have long recognised these benefits, and the business case for buying wind power keeps getting stronger. Onshore wind is now the cheapest source of new power in many parts of the world – and could fall by a further 26% by 2025.

There is no reason why a smaller firm should miss out just because they do not have the same financial clout as Apple. In fact, it is vital that they don't.

The 2015 Paris Agreement on climate change was signed by 196 countries. This showed that every country and company, no matter what their size, can play a role in helping the world move away from fossil fuels and towards renewables. President Trump may want to wreck the deal, but he cannot destroy the financial case for wind power.

However, as Apex's Steve Vavrik and Melissa Peterson say here, there are big challenges for businesses who want to sign PPAs of less than 50MW each.

One common obstacle is the complexity of these deals. There is no single type of PPA, which means that anyone looking at these kinds of deals has to get to grips with a host of structures. The terminology can be daunting even for those who work in wind every day.

That is where wind farm owners need to help – and Apex is already doing so. In the last two years, it has worked with firms including Steelcase and Avery Dennison. We have included case studies on those deals in this report.

And it is not just the electricity buyers that can benefit. Sub-50MW PPAs can help investors, and make the difference between a project being built and not. We cannot afford to ignore them.

All the best,

Rich

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HOW TO WIN WITH WIND PPAS

Energy buyers, developers, and investors can all benefit from sub-50MW power purchase agreements. Richard Heap reports

“It’s starting to snowball. Amazon, Microsoft, Apple, Google — they’re all doing these, and now their peers and suppliers are looking into this too.”

Over the past four years, there have been a host of new entrants into the US clean energy marketplace.

Blue-chip companies in the United States have signed wind energy power purchase agreements (PPAs) totalling almost 5GW. They are the fastest-growing segment of clean energy buyers in the country.

The American Wind Energy Association (AWEA) released data in December showing that many companies, including numerous Fortune 500s, are increasingly embracing renewables such as wind. Global giants, including Amazon, Google, and Walmart, are among those buying wind power to help reduce and stabilize their electricity costs, boost energy security, and ‘go green’.

This interest from the corporate and industrial (C&I) sector shows there is great support for US wind power despite the Trump administration’s lack of support for renewable energy. But the focus on Fortune 500 companies does not tell the whole story, according to Steve Vavrik, chief commercial officer at Apex Clean Energy.

Vavrik says the market is changing, and he is seeing more interest from smaller companies who want to sign PPAs with wind farms: “It’s starting to snowball,” he says. “Amazon, Microsoft, Apple, Google — they’re all doing these, and now their peers and suppliers are looking into this too.”

That means larger numbers of small C&I customers are starting to sign PPAs with wind developers, at the 50MW level and below. They are seeking the same benefits as the larger firms, including fixing their electricity costs, stabilizing price volatility, and meeting their sustainability goals.

In this report, we will look at how C&I customers, wind developers, and investors can all benefit from the rise of smaller wind PPAs; and ways the sectors could work together to achieve their individual goals.

RISE OF CORPORATE PPAS

Set up in 2009, US renewable energy company Apex Clean Energy operates ten wind farms totalling 1.7GW; completed over 1GW of projects annually in 2015 and 2016; and maintains the largest pipeline of projects in the country, totalling over 12GW. It is now one of the largest privately-owned wind companies in the United States. It also offers solar and storage solutions.

Its expansion mirrors the growth of corporate PPAs. In 2012, there were only 16MW



Corporate buyers: Apex sold its 165MW Cameron wind farm in Texas to Ikea



Source: Apex Clean Energy

of corporate wind PPAs signed in the United States, according to AWEA. This rose to 593MW in 2013, tapered off to 531MW in 2014, and then surged to 2.5GW in 2015. AWEA said 1.6GW of corporate wind PPAs were signed in the United States in 2016 – which is 39% of the country’s wind PPAs last year.

The rise of corporate PPAs offers a major opportunity for developers, as it has given them an alternative to conventional PPAs with utilities. So how do they work?

A corporate PPA enables the developer to sell its power directly to a firm for a fixed price and a set term, typically between ten and 15 years. This structure protects the wind farm owner from the volatility of

selling its power on the merchant market, where prices fluctuate, and gives it certainty about the long-term project revenues needed to construct and finance the facility.

In addition to the electricity, the corporate buyer receives the facility’s renewable energy certificates, which are used to show that the company is purchasing clean energy and which can be ‘retired’ to meet corporate sustainability goals.

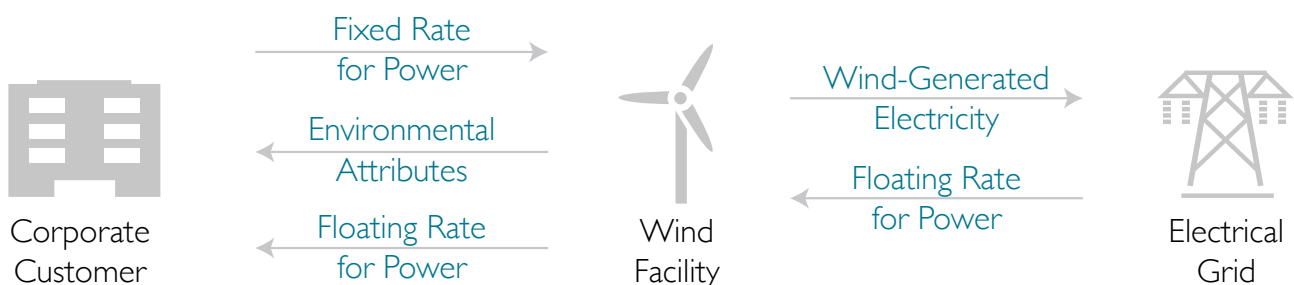
CORPORATE PPA TYPES

From the standpoint of the corporate customer, there are two main types of PPAs: physical PPAs and virtual PPAs.

The physical PPA structure includes the

AWEA said 1.6GW of corporate wind PPAs were signed in the United States in 2016 – which is 39% of the country’s wind PPAs last year.

How they work: Structured Power Purchase Agreements



tangible delivery of energy, meaning that a corporate customer who has agreed to buy power from a specific project receives the energy directly from that wind project to its load. This PPA works best when the customer's facility or load is located close to the wind farm.

The virtual PPA, also known as a structured PPA (see box, p.5), is a bit more complex. Under this structure, the corporate customer enters into a contract to buy power from a specific project at a 'fixed' price for a set period, typically one-hour increments.

The project then sells its power into the merchant market. This is called the 'floating price'. If the 'floating' price is higher than the 'fixed' price agreed to in the PPA, then the project pays the difference to the corporate customer. Likewise, if the merchant market price is lower than the price agreed to in the PPA, then the corporate customer pays the difference for that period.

Alongside the virtual PPA structure, the corporate customer continues 'business as usual' and buys its electricity in real time from the local or regional utility. The virtual PPA structure then acts as a hedge against rising electricity prices over time, because the "fixed" rate stays constant over the ten-to-15-year term of the contract and the "floating" price increases with inflation and rising energy costs.

For example, in February 2016, Apex signed a 12-year, 25 MW PPA with office furniture maker Steelcase for power from the 147 MW Grant Plains Wind facility in Oklahoma (see box, right).

Steelcase pays a fixed price for each unit of electricity from Grant Plains and settles each floating hour on the merchant market. It continues to pay its utility for regular electricity service. If open-market power prices rise, then the virtual PPA acts as a hedge against those rising prices; if those prices fall, Steelcase pays the difference.

COMPLEXITY FOR CUSTOMERS

Confused? You are not alone. The complexity of these structures is often a hurdle for prospective buyers as, for many, energy is not their core business. One of the main constraints for smaller C&I customers signing a wind PPA is the complexity and time involved in executing a contract.

Apex has been an industry leader in helping smaller corporates tackle these issues;

Case study: Steelcase's 25MW PPA



Office furniture maker Steelcase last year signed a 12-year PPA with Apex for 25MW of the output from the 147MW Grant Plains wind farm in Grant County, Oklahoma. This deal is a great example of how PPAs can benefit both electricity users and wind farm developers.

In this virtual PPA, Steelcase pays a fixed price for each unit of electricity it receives from Grant Plains and settles each floating hour on the merchant market. Steelcase also continues to pay its utility for regular electricity service.

If open-market power prices rise, then the virtual PPA acts as a hedge against those rising prices; if those prices fall, Steelcase pays the difference.

As well as the immediate financial benefit, the deal enables Steelcase to continue to deliver on its long-term corporate commitment to renewable energy. The company has supported renewable energy developers since 2001, and the Environmental Protection Agency has

rated it as one of the top 50 green power users in the US.

Since 2014, Steelcase has also invested in renewable energy credits equivalent to 100% of its global electricity consumption, including at its headquarters in Grand Rapids, Michigan (see above). The Grant Plains deal is equivalent to almost half of Steelcase's renewable energy purchases, and helped to diversify its portfolio.

Jim Keane, Steelcase president and CEO, called the deal an important step in its strategy to reduce its energy use and invest in "economically-beneficial projects".

The deal helped to support construction of Grant Plains, which means Steelcase is able to show that it has helped add more renewable energy capacity to the grid, and enabled Apex to bolster the business case for the scheme. This PPA was signed in February 2016, and Apex sold Grant Plains to Southern Company arm Southern Power in August 2016. The facility began operating late last year.

the Steelcase PPA was the first of this smaller deal type that Apex executed after several deals with larger corporates such as Ikea and Google.

It followed the Steelcase transaction with a 20MW virtual PPA in December 2016 with labelling and packaging materials manufacturer Avery Dennison, for power from the 300 MW Perryton Wind farm that Apex plans to build in Texas (see Q&A, p.7). The agreement enables Avery Dennison to offset 50% of the greenhouse gas emissions from its US electricity use, and is key to its goal of cutting emissions by 26% from 2015 levels by 2025.

These smaller deals are still relatively rare, and Vavrik says this is because power-buying in smaller companies is typically

Q&A: Dan Wiedl, Senior Director, Avery Dennison



Labelling and packaging materials firm Avery Dennison signed a 20MW virtual PPA with Apex in December 2016. We spoke to its senior director Dan Wiedl to find out more about the process.

Why is wind a good fit for your firm?

In our corporate sustainability goals for 2025, we set an ambitious greenhouse gas emissions reduction target of 3% absolute per year, or 26% in total over ten years.

Historically, improving energy efficiency had been central to our greenhouse gas reduction effort. However, to reach our more aggressive commitments, it was clear that we needed to augment our approach with renewable energy.

Wind power was a perfect fit for our US-based manufacturing footprint, offering clean, renewable energy at a large scale: the Perryton Wind PPA we signed with Apex Clean Energy will provide power equal to around 50% of our US sites' electricity consumption.

Would you say the process was more of a partnership or a transaction?

I would definitely characterize the process as a partnership as opposed to simply a transaction. From the onset of con-

tract negotiations, it was clear that Apex was committed to developing a PPA that provided value for both parties. Throughout the process, their team was quite flexible in accommodating our needs and requests, but also very transparent about their position where they could not.

I think it's also worth noting that this was Avery Dennison's first foray into a large-scale, long-term PPA, and Apex's team was extremely patient and collaborative as we moved through the learning curve.

“This was our first foray into a large-scale, long-term PPA, and Apex’s team was extremely patient.”

Why did you do the deal with Apex?

A successful track record of delivering projects was a 'must' in our screening of potential developers. The PPA we signed with Apex will be a substantial component of our long-term greenhouse gas reduction strategy, so in the vetting process it was critical that we limited the field to developers that we were confident could bring the project to fruition.

There's a significant time investment in the contract negotiation process, and a substantial lead time from PPA signature to commercial operation. At the end of that path, we want new turbines to be spinning and generating clean power.

What reservations did you have — if any — about signing a wind PPA?

I think the knowledge gap was the biggest hurdle to clear in committing to the PPA.

As newcomers to the PPA arena, we had to invest a great deal of time in educating ourselves about the renewable energy landscape, PPA deal structures, and energy market dynamics to make sure it was the right fit. We engaged a third party with extensive experience in the field to support us through the request for proposals (RFP) process, developer selection, and contract negotiation; and Apex was also quite helpful in the education process.

We embarked on the project as relative neophytes in the field, but reached the finish line feeling well-informed and confident in a PPA that fit with our strategy.

What would you advise organizations who are considering doing likewise?

A wind PPA is extremely compelling for organizations searching for large-scale renewable energy opportunities.

There's a great deal to learn if you're starting from ground zero, so it's essential to find the right external partners to help you navigate the path, encompassing consultants and external legal counsel with experience in the field, as well as a good, collaborative developer.

The right team will help you to construct a PPA that fits your organization's needs, and arm you with the tools to communicate that within your organization.

“Usually the hardest thing is the distraction. These companies are doing other things.”

handled by people who are not power experts and who have taken on this role alongside their 'day job'. "Usually the hardest thing is the distraction. These companies are doing other things," says Vavrik.

Often, though, smaller firms have the same concerns as larger, multinational corporations. "It's typically driven by a desire to do something about sustainability and carbon. They want to do something more than they have been doing. Ikea articulates this the best. They take responsibility for their products and the impacts they have on the planet. It's a very personal mission for their founder," says Vavrik.

The deals are usually instigated by those at the top of the company, and support at the board level is crucial.

"Avery Dennison has this really strong sustainability mission and they just decided at

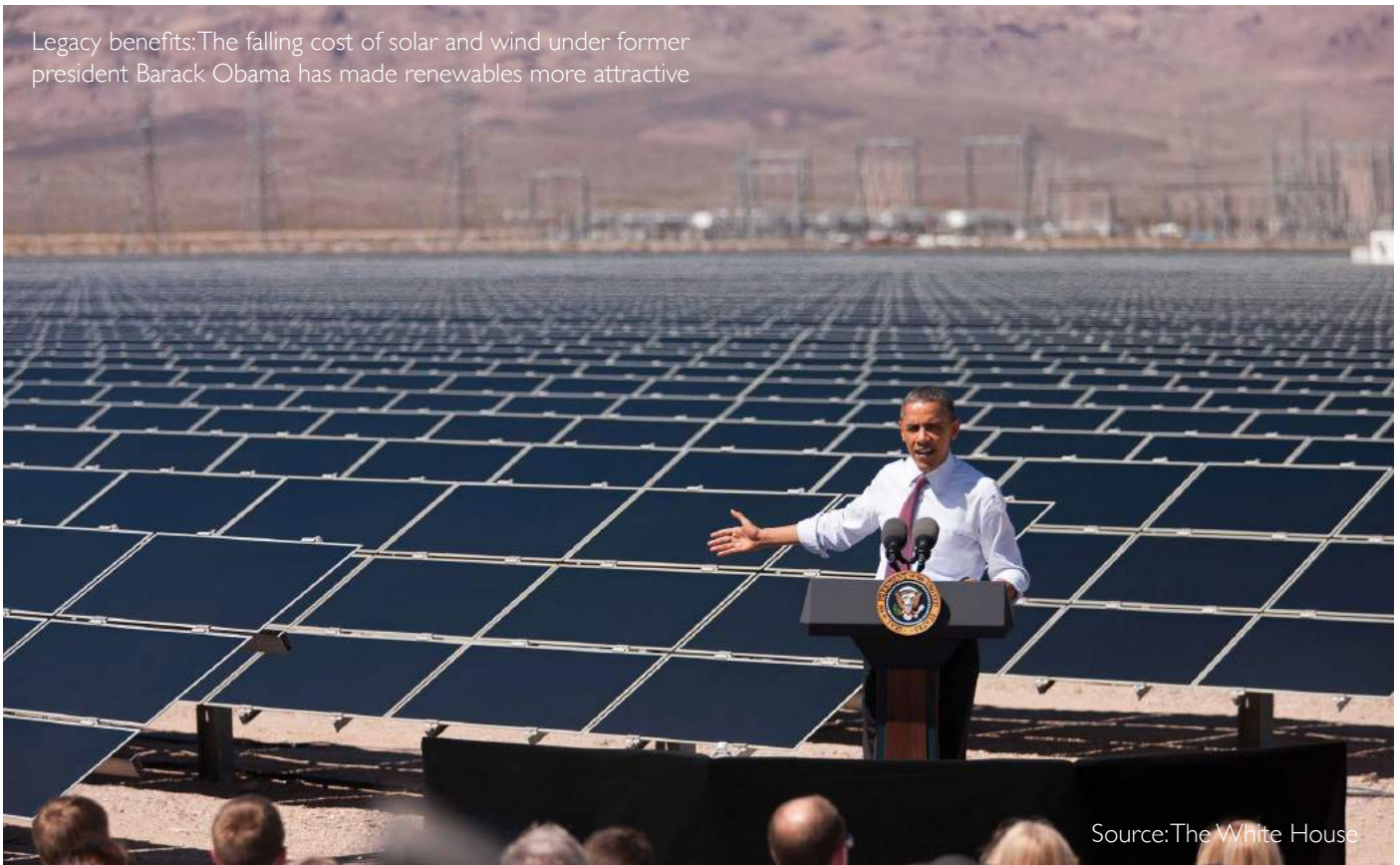
the top level: 'We are going to do this,'" says Melissa Peterson, director of business development at Apex Clean Energy.

She continues: "It was delegated to the head of their production and engineering group, and though it isn't really his job, he had to get it done. It's important to have buy-in from that top level."

If that buy-in does not exist, it means someone lower down in the firm must educate management on the details of something about which he or she is not an expert.

To help smaller corporations navigate the PPA process, in November, Apex partnered with the American Council on Renewable Energy (ACORE) to create the 24-page *Renewable Energy PPA Guidebook for Corporate & Industrial Purchasers*, which goes into depth about the structures, risks, and rewards of such deals.

Legacy benefits: The falling cost of solar and wind under former president Barack Obama has made renewables more attractive



Source: The White House

One potential solution to help marshal disparate buyers is aggregated PPAs, in which a group of companies team up to buy power collectively.

It is also crucial that project owners and corporate customers work closely to get a deal executed. A PPA establishes a long-term relationship that spans many years, so transparency and communication are key.

Dan Wiedl, senior director at Avery Dennison, identified the relationship this way (see opposite for full Q&A): “I would definitely characterise the process as a partnership as opposed to a transaction.”

One challenge for developers seeking to secure these deals is that buyers can have very different priorities. Peterson says some companies are interested in the benefits of stabilising their energy prices while others aren’t; some simply want to demonstrate that the deal is low risk; others want to demonstrate “additionality”—essentially, that their PPA has enabled a developer to put additional clean energy onto the grid.

Regardless of the goal, developers are under pressure to find deals that work for their customers, whether the PPA is for 5MW or 50MW. The key for customers, therefore, is to partner with a developer who will be flexible and understand the needs of corporations and investors.

STRENGTH IN NUMBERS

One potential solution to help marshal disparate buyers is aggregated PPAs, in

which a group of companies team up to buy power collectively, to give them all greater purchasing power and the chance to gain economies of scale. The idea is still new, and Peterson says that working with a trusted partner could help ease them through the process.

There is a lot of hesitancy from companies that find PPAs too complex, Peterson continues, so these power-buying groups would benefit from a group purchasing approach with advisors who help support them through the process.

This partner could be a non-profit organisation such as ACORE, Rocky Mountain Institute, or the World Wildlife Fund; an investment partner; or one of the potential corporate buyers, who can then bring others on board. The organiser would need to coordinate the firms’ differing priorities and timetables.

Peterson adds that renewable energy companies, such as Apex, can be flexible enough that aggregated PPAs would not fall apart if one of the potential electricity buyers was unable to commit in the end: “If we had ten people looking at 5MW each and we went through the process but, at the end, only half of them signed, that would be fine for us. It isn’t as though we need them all to commit or else nobody can do it. It isn’t all or nothing,” she explains.

Starting work: PPAs can give developers the certainty they need to start building projects



“The evolution of new PPAs is one way to make job growth happen, by stabilising electricity costs into the future.”

The aggregated PPA model could help open up the wind market to more customers, making wind projects more available to any buyers who are interested.

IMPACT ON INVESTORS

Apex sees a broader variety of PPAs as important for the expansion and evolution of the wind industry.

More creative and bespoke PPAs provide developers the certainty they need in terms of the revenue they are set to receive from their projects, thus helping them attract financial backers and investors for their projects.

Fixed-price PPAs cannot answer all investor concerns, however. Typically, a wind farm has a lifespan of 25 years, but, for example, a PPA might only last 12 years. That leaves a period after the PPA expires when the electricity from the project may need to be sold on the merchant market, bringing price uncertainty.

It is possible to mitigate this risk with the fixed price of the electricity agreed to in a PPA: the power price would tend to be higher in a shorter-term PPA, because the investors want to recoup more of their investment in the contracted period. This price also reflects the fact that they are taking on uncertain revenue risk after the PPA term ends.

The length of the PPA and the strength of the

contract are just two more risks for investors to consider.

Although a typical corporate PPA lasts between ten and 20 years, there are exceptions. For example, in January 2016, Apex executed a 28-year, 66MW wind and solar PPA with the US Army for electricity for the Fort Hood garrison in Texas. Most corporate customers would find it almost impossible to give that level of certainty to investors.

But it is not only electricity buyers, developers, and investors that can benefit from this type of deal. Vavrik says that enabling more businesses to buy clean energy, and deliver their corporate strategies, would benefit the United States as a whole.

If corporate, industrial, and manufacturing companies can fix their long-term electricity costs and avoid paying annual increases, they can plan for future cash flows and open the market to more hiring and job growth, which is important for the entire US economy. Vavrik says: “The evolution of new PPA types is one way to make job growth happen—by stabilising electricity costs into the future—and helping smaller businesses follow the example of their larger counterparts is something Apex is proud to do.”

Ultimately, if buyers want to sign PPAs for clean, renewable energy, then firms like Apex will make sure they have the opportunity. ■

ABOUT THE AUTHORS



STEVE VAVRIK, CHIEF COMMERCIAL OFFICER, APEX CLEAN ENERGY

Steve brings 20 years of power development experience to Apex, having worked at GE Capital, Enron, Dynegey, First Wind, and SunPower.

During his career, Steve has worked directly on the development of over \$3bn of wind and solar projects that are now operating. Steve earned a JD from Yale Law School, an MPA from Princeton, and MS and BS degrees in mechanical engineering from the University of Illinois.



Apex Clean Energy builds, owns, and operates utility-scale wind and solar power facilities. Apex was the US market leader in 2015 and has brought nearly 1,700MW online over the past two years.

With a team of over 200 professionals and the nation's largest wind energy project pipeline, Apex is a leader in the transition to a clean energy future.

For more information, visit www.apexcleanenergy.com.



MELISSA PETERSON, DIRECTOR OF BUSINESS DEVELOPMENT, APEX CLEAN ENERGY

Melissa supports power marketing efforts and acquisitions of projects at Apex. Her power marketing efforts led to the execution of the largest hybrid (wind and solar) renewable energy project with the U.S. Department

of Defense. Previously, she worked for EDF Renewable Energy, where she developed over 750 MW of operating wind energy projects. Melissa has an MS in conservation biology from the State University of New York at Albany and a BS in biology from the University of Wisconsin.



Sign up today

A Word About Wind members can read more on Apex Clean Energy's strategy in our special report Finance 2017, in which we spoke to its founder Sandy Reisky.

To find out about our membership plans, visit: www.awordaboutwind.com



RICHARD HEAP, EDITOR, A WORD ABOUT WIND

Richard Heap joined A Word About Wind as editor in 2014. He is responsible for writing the news and analysis in the newsletters three times a week; developing the programme of special reports; and shaping events.

A graduate of the University of Southampton and London's City University, Richard started his career in business journalism in 2005 as a trainee at global publishing firm United Business Media, writing about a wide range of business sectors.

After this he joined industry-leading commercial property magazine PropertyWeek in 2006, where he was nominated for a series of awards. He spent five years at the publication, including three years heading its professional and legal coverage.

In 2011, Richard became research manager at the Sunday Times Fast Track, where he managed the Profit Track 100 and Tech Track 100 reports in The Sunday Times; and then spent one year working for the New York-headquartered Future Cities.



A Word About Wind started life in 2011 as a news and analysis service for time-poor wind industry professionals, and is now read by over 2,500 people each week.

In addition to the newsletters, A Word About Wind subscribers and members benefit from an extensive and growing programme of focused industry reports. These include the flagship Top 100 Power People, which shows where the real influence sits in this global market; and our Women's Power List, which we published in March to tie in with International Women's Day.

These reports contain insight from big-hitting interviewees, with recent profiles of Samuel Leupold, head of wind at Dong Energy; Francesco Venturini, CEO of Enel Green Power; David Jones, head of renewables at Allianz Capital Partners; Ian Mays, former CEO at RES Group; MUFG's Carol Gould; and more.

And that is not all. A Word About Wind also runs networking events throughout the year including the annual Financing Wind conference, which is happening this October. To find out more, and sign up for a free 30-day trial visit www.awordaboutwind.com

A WORD ABOUT WIND

