

Corporate Renewable Energy Procurement Monthly

This is the third issue of Bloomberg New Energy Finance's monthly analysis of corporate renewable energy procurement. It details recent global power purchase agreement (PPA) deals, provides market updates for the US and Iceland, and provides details of two recent deals in the Netherlands and in the US. This month's issue also includes an interview on corporate renewable energy procurement with Brian Janous, director of energy strategy for Microsoft.

RECENT DEALS

Off-taker	Project name	Country	Size (MW)	Current project owners	Our take
Amazon Web Services	Amazon Central II Wind Farm	United States	189	EverPower Wind Holdings	This is Amazon's second wind PPA in Ohio, following a 100MW deal with EDP Renewables in November 2015. When the project begins producing in December 2017, Amazon Energy will assume ownership of the physical energy and settle it on the PJM wholesale power market. <i>Date: 31 October.</i>
Microsoft Corp	Capital Power Bloom Wind Farm	United States	178	Capital Power Corp	Microsoft entered an agreement with Allianz Risk Transfer (ART) to fix long-term energy costs and purchase environmental attributes, using a 10-year Proxy Revenue Swap. Microsoft is the first off-taker to participate in this mechanism. <i>Date: 14 November.</i>
MIT; Boston Medical Center; and Post Office Square Redevelopment Corporation	Dominion Summit Farms PV Plant	United States	70.6	Dominion Resources	Massachusetts Institute of Technology (MIT), Boston Medical Center and Post Office Square Redevelopment Corporation signed this joint offsite PPA for 70.6MW in North Carolina. More details of the deal can be found below. <i>Date: 19 October.</i>
Microsoft Corp	Happy Jack & Silver Sage Wind Farms	United States	59	Duke Energy Renewables	Microsoft also announced its long-term agreement for RECs from the Happy Jack and Silver Sage wind farms, close to its Cheyenne data centre. <i>Date: 14 November.</i>
HSBC Mexico	Enel Dominica Charcas Wind Farm I & II	Mexico	15	Enel Green Power	HSBC's wind PPA in Mexico is likely to be one of the final deals struck under Mexico's current power market rules. It is expected future corporate PPAs will be signed under the new energy reform rules. <i>Date: 19 October.</i>

Source: Bloomberg New Energy Finance. Note: This table represents the largest deals during the period of last issue to date.

MARKET UPDATES

AMERICAS (AMER)

US corporate PPAs: market forecast

Over a third of US clean power contracts signed in 2015 were with corporate buyers like Apple, Alphabet, Facebook and Microsoft. These non-utilities have committed to sourcing 100% of their electricity from renewable energy, contracting with developers like NextEra Energy, NRG Energy, and First Solar to do so. Luckily for developers of wind and solar farms in the US, corporate demand for PPAs has been growing at a 64% compound annual growth rate since 2010.

About 10GW of such deals have been signed in the US since 2008, enough to meet all of Northern California's commercial-sector power demand. A growing number of companies have set ambitious corporate renewable energy commitments and are shifting away from meeting those commitments with renewable energy credits (RECs). Corporates prefer PPAs, despite the additional cost, because PPAs incentivise the building of new renewable energy, providing 'additionality'.

BNEF estimates that corporates will likely sign another 17GW of wind and solar PPAs in the US by 2025 just to meet their publicly announced commitments. If companies beyond first movers become interested, the total potential market for corporate procurement could be four times greater (Figure 3).

For additional details and analysis on the future of corporate PPAs in the US, see our Research Note, *What's the growth opportunity for corporate PPAs?* (web | terminal).

Boston entities join forces to sign offsite solar PPA

MIT, Post Office Square Redevelopment Corporation and Boston Medical Center recently signed the largest aggregated renewable energy PPA in the US to date. The 71MW Dominion Summit Farms PV project will be built in North Carolina. MIT is expected to hedge 40% of its energy consumption under the fixed 25-year PPA, while the Boston Medical Center and Post Office Square Redevelopment Corporation will hedge nearly all of their consumption.

The PPAs are virtual, with associated RECs being sold on the PJM REC markets and physical energy being delivered to the PJM grid. Boston Medical Center and Post Office Redevelopment Corporation are expected to receive substitute RECs generated elsewhere in PJM, rather than RECs generated by the project. This improves the economics of the deal. Neither of these entities have sufficient electricity to sign a non-aggregated PPA. CustomerFirst Renewables negotiated and structured the deal after evaluating 40 wind and solar projects in markets across the US.

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EUROPE, MIDDLE EAST & AFRICA (EMEA)

First Dutch “consumer-to-business” PPA

On 14 October, a consortium of Akzo Nobel, DSM, Google and Philips announced an agreement to buy 95% of the output from the 102MW onshore Krammer wind farm in the Netherlands when it is operational in 2019. The wind farm is to be built close to the coast and expected to benefit from a high capacity factor of around 39%. The wind farm is also backed by the SDE+ feed-in premium scheme. Whilst examples of corporate PPAs involving more than one off-taker are not particularly unusual, this deal involves a dedicated consortium of four major business players. It was formed two years ago for the very purpose of meeting corporate sustainability targets in a “cost-effective and scalable way”. This form of grouped PPA is a first in the EMEA region. The project is owned by a community co-operative, involving more than 4,000 members from the Zeeuwind and Deltawind co-operatives. The co-operative will consume about 5% of the project output, with the rest shared equally between the four consortium members. As co-owners, members of the co-operative will receive returns on their investment, but the co-operative also aims to re-invest in other projects in neighboring municipalities. This is an interesting development in the corporate PPA space. It begins to open up the potential for corporates to club together to purchase renewable electricity from much larger projects – capacity that they would not individually have the demand for. Transacting with a group rather than an individual off-taker also leads to greater bankability for the developer of the project.

Corporate procurement in Iceland

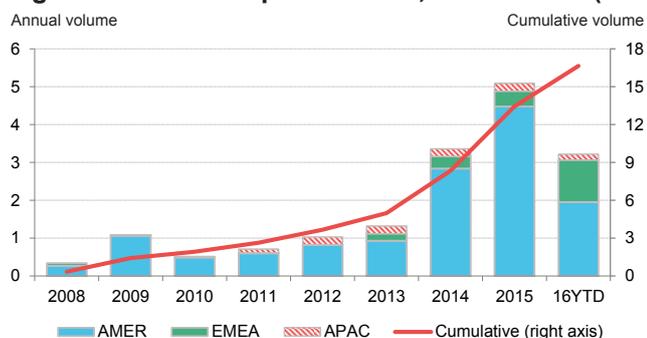
Having an isolated grid with excess renewable energy capacity, Iceland’s government is looking for opportunities to attract large corporates. The country is almost exclusively supplied by renewable energy, mainly geothermal and hydropower. Its energy market is an oligopoly, involving only three main companies, thus reducing the pool of suppliers corporates can contract with.

Iceland’s government has opened the ‘Invest in Iceland’ programme, particularly focused on the growth of data centres in the country. Offering tax incentives and highlighting the potential for low capex costs, the government has made Iceland a potential growth market for corporate PPAs. Its carbon-free power system and cool temperatures do provide it with useful characteristics to attract data centre owners with strong sustainability strategies. However, with additionality as an important consideration for many corporates, it remains unclear as to whether there will be a business case in Iceland on these grounds. The country already has substantial renewable energy generation, and signing PPAs on these existing projects would not satisfy the requirements of many corporates for additionality. If corporate PPAs were to grow, many of these deals would be pegged with the main Icelandic energy providers, rather than independents, due to Icelandic energy policies. As such, these would more likely be green tariff-type supply contracts. For more, see our Research Note on *Corporate PPA hotspots in EMEA* (web | terminal).

ASIA PACIFIC (APAC) – full analysis of developments in the APAC market will be covered in next month’s issue.

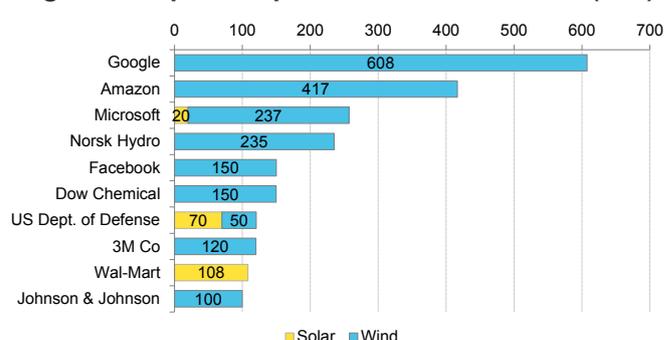
DATA

Figure 1: Global corporate PPAs, 2008-16YTD (GW)



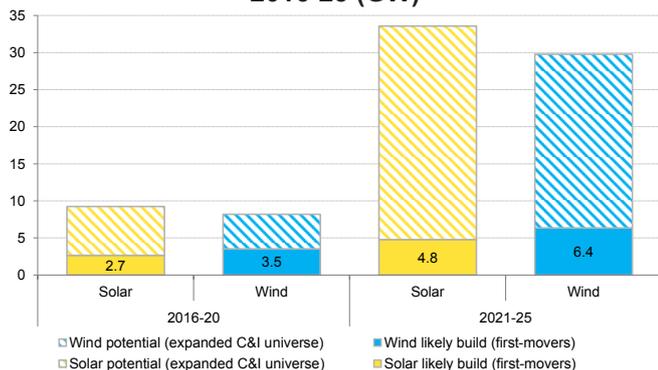
Source: Bloomberg New Energy Finance. Note: APAC capacity is estimated and will be updated on an ongoing basis.

Figure 2: Top 10 corporate off-takers in 2016 (MW)



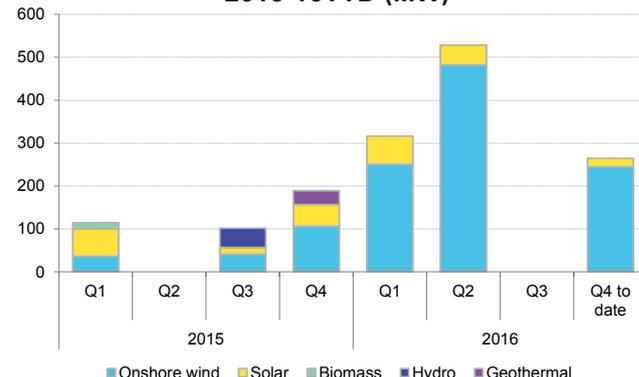
Source: Bloomberg New Energy Finance.

Figure 3: Potential US corporate PPA demand, 2016-25 (GW)



Source: Bloomberg New Energy Finance.

Figure 4: Corporate PPAs in EMEA by quarter, 2015-16YTD (MW)



Source: Bloomberg New Energy Finance.

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INTERVIEW: Microsoft aims to be directly supplied by renewable energy – 50% by 2018 and 60% by early 2020s

Brian Janous, director of energy strategy at Microsoft, spoke to Bloomberg New Energy Finance about Microsoft's renewable energy procurement strategy. He said that "energy has effectively become the raw material of our core cloud product" and highlighted Microsoft's ambition to leave a positive legacy for the grid.



Q: Why have the large tech companies been the first movers in the corporate procurement space?

A: In part, this is because the nature of the industry is to innovate, but also because energy is the new challenge for these companies. A few years ago, big cloud and web companies were not thinking about energy as a core input to their product. The transition for Microsoft to a cloud-based company has involved a shift in our thinking on

how we serve our customers. Energy has effectively become the raw material for our core cloud product. It is something that has taken a greater prominence in the way we think strategically – how we manage the costs of providing our services and products, how we think about the implications of our infrastructure investment decisions, and what our global sustainability and environmental impact is.

Q: Could you provide a breakdown of your corporate procurement strategy?

A: We have been committed to – and achieved across the company – carbon-neutrality since 2012. Today, 100% of the electricity used by our data centres is renewable based on a mixture of direct projects and renewable energy certificates. More recently, we committed to specific energy goals related to our data centres. We aim to be 50% supplied directly by wind, solar or hydro resources by the end of 2018, and 60% by the beginning of the next decade. We are working to increase the percentage of PPAs and direct purchasing so that we can hit those targets.

Q: Microsoft indicates a preference order for renewable energy procurement – direct sourcing, PPAs then RECs or offsets. Why is this your preferred order?

A: Our overarching goal is to make contributions towards greening the grid across the globe. It is important for us to ensure our actions are going to leave a positive legacy, and address not only our own footprint, but also benefit the grid as a whole. We also consider whether the activities we are undertaking can be replicated by others. We feel it is not just something that Microsoft should be concerned about for our own footprint. The bigger question is how we accelerate progress towards rapid decarbonisation.

Q: Microsoft has undertaken a number of PPAs in the US, but not globally. Why is this?

A: It is certainly not due to a lack of interest. We have been actively looking at opportunities overseas but the markets are very different. Some places, like Southeast Asia, are very challenging due to a lack of resources. In other areas, the market structures as well as the regulatory and support regimes, for example in Europe, are very different. We are looking at different approaches in these areas. We have been very active in the US, but I would

certainly expect that you'll see some more activity from us in other parts of the world in the next year. It is a big focus for us to expand our activity beyond the US.

Q: As long-term agreements, can PPAs save you money?

A: There is no denying that this has been a very challenging environment for anyone (utility or otherwise) who wants to build new generation of any sort. Today, nothing is cheaper than the grid. Certainly in the US, power prices are incredibly depressed. In Europe and Asia, prices are significantly lower than just a few years ago. As such, everyone is competing with the market, which the price signals would tell us, does not need more generation of any sort. This very low market price environment is a real challenge for companies who are trying to aggressively bring new renewable generation into the grid and a significant issue for anyone trying to do PPAs or any sort of renewable [energy] purchasing. We are committed to bringing these resources online to support long-term growth. While cost savings may be a byproduct, it is not why we are doing it. We see cloud as a fundamental technology that is going to underlie the innovations of the 21st century – data is the electricity of the 21st century! Our executives are committed to building a responsible cloud. This means renewable energy is going to supply our cloud and that is the primary driver for us.

Q: Why did you implement an internal carbon fee?

A: We wanted to promote awareness and understanding internally within the company about our commitment to carbon-neutrality. By using the internal carbon fee we could ensure the cost of complying with our carbon-neutrality mandate would filter through to the individual business units. This process has provided us with the opportunity to engage with the leaders of these business units on a regular basis and inform them about what we are doing and why. In terms of scale, last year, the total revenue generated through the carbon fee was \$20 million.

Q: How do you calculate your carbon fee?

A: The fee changes every year. In establishing the fee, we looked at a lot of different options, including the social cost of carbon and what governments are doing to set targets. We determined that the most effective approach was to let the market determine the cost of carbon. This is the cost to comply (for example Guarantees of Origin or RECs) in each of the markets we operate in. This varies dramatically across the globe. To calculate the fee, we track and analyse our emissions across all Microsoft operations and create a projection of emissions for the coming year. We then add up the total cost of the environmental initiatives and investments that it will take to get to net-zero carbon. The full cost of these environmental initiatives and investments divided by our carbon footprint provides us with our annual price on carbon.

Microsoft is a member of RE100 – a collaborative, global initiative of influential businesses committed to 100% renewable electricity.



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