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In this issue

PPA trends: Still short-term?

New markets in Eastern
Europe

Developers on revenue
strategy

Merchant Risk

How PPAs are
being shaped by a
changing world





Reframing the key issues

Insight, connections and communications for the global energy transition.



Editorial

BY CRISTINA BROOKS, ANALYST AND JOURNALIST

European power prices cooling off this quarter has forced the PPA market to start settling down. But it has been a roaring 20s so far — and a sign of rollercoaster years to come.

In Europe, experts warn of continued power price changes in the coming decade, with consulting firm McKinsey & Company noting that in the wake of the Ukraine war and the COVID-19 pandemic, the energy landscape has become increasingly “circular, complex, and volatile.”

Corporates scrambled to buy European PPAs amid record power prices linked to the war last summer, and developers and advisory firms were able to use these to counterbalance some higher capital costs.

On 5 June, the European Commission finally said it would discontinue the revenue price cap measures required by the energy crisis. It said that EU electricity market prices had climbed down from record highs last year, so that the emergency price cap was not necessary – for now. EU countries had helped ease the power market crunch by cumulatively cutting consumption by 5 per cent during peak hours.

In Greece and Poland, price caps were seen to impact PPA negotiations. We heard that in Poland price caps made project revenue assessments difficult and in Romania they discouraged PPAs by removing the reference price, also impacting financing discussions.

Kristian Ruby, secretary general of the EU power sector association Eurelectric said in June that power price volatility is destined to become common in a renewable-dominated market. He urged investors not to be discouraged, even if it means adjusting to a lack of the long-term price signals traditionally needed to take FID on offshore wind, nuclear and network projects.

The sharpness of these power price spikes has also made developers more cautious about adopting fully-merchant revenue models, and they say they need greater government CfD auction support to cover their costs.

Developers, advisory firms and legal experts have all started seeing “dynamic” changes in structure for PPAs, with increasing capped indexation. Shaping needs are encouraging players to adopt new ways of combining offtakers and different projects under deals. And, as the cost of baseload goes up, more players are looking into future opportunities to structure baseload contracts using different types of assets.

In Eastern Europe, countries are making progress towards energy transition. Romania is preparing for its first-ever CfD auctions, set to spur the build-out of wind and solar. Bulgaria, as part of its bid to join the Eurozone, must decrease its power price-driven budget deficit, and wind power might be one solution.

We welcome the contributions in this issue from developer, investor and legal minds with insider views as we explore merchant risk trends and emerging markets.

Contents

- 05** Making lasting PPA deals in uncertain times
- 14** PNE's Nils Kompe
- 16** PPA activity and price trends
- 22** Investing in wind for a strong Eastern Europe
- 29** Allianz Capital Partners' Stefan Henge
- 31** Quarterly wind disputes
- 33** Corio CEO Jonathan Cole
- 36** SkySpecs CEO Danny Ellis

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Making lasting PPA deals in uncertain times

Price volatility in energy markets over the past year has been a sword that cuts both ways. Fears of soaring costs are driving corporates in droves to sign PPAs. European PPA volumes bought in the first quarter – led by solar – were on track to break records. This surge of demand led to high PPA prices seen, over €100/MWh. Despite a slowdown in demand over the second quarter, appetite for PPAs remains high.

All of this should be good news for the wind project developers and investors who sell PPAs. But commodity price surges have hurt PPA sellers and buyers alike, with high construction costs quashing developers' new wind farms and throttling buyers' options for new projects. High supply chain costs are creating a "seller's market," according to enterprise software and advisory company Pexapark's COO Luca Pedretti.

The past year saw PPA renegotiations in which buyers were asked to accept higher prices to help shoulder sellers' soaring capex costs. In the US, the growing gap between the PPA price agreed and global supply chain costs meant US offshore wind project Commonwealth Wind was unable to reach its FID, and offshore project SouthCoast Wind will seek to cancel its PPAs. Both projects aim to rebid in the next Massachusetts PPA auction. Meanwhile, last year in Europe "not

a single offshore wind farm reached FID" due to regulatory interventions trying to tame power price volatility, says trade body WindEurope.

Some dealmakers in the wind industry described last year as hard. In some cases, a fully merchant structure has been restructured to allow a PPA to be able to adapt and survive "a very bad year." Not only have we just been through a bad year, but they are certain to occur in the future. For example, when offtakers see power prices falling below €10 in the morning, they may begin to request flexibility from parties to their existing PPAs.

Corporate offtakers in Europe are becoming "increasingly nervous" about signing long-term PPAs because of the EU's promise to de-couple electricity prices from soaring gas prices as part of electricity market reform, which might lead to lower power prices as years pass. "As a result, new sophisticated pricing structures have started to emerge that allow for the re-opening of pricing mechanics if there are significant market movements," wrote partners at law firm Norton Rose Fulbright in May.

Europe had low availability of wind project PPAs in the past year, not only due to supply chain constraints and capex

increases, but also to permitting challenges, according to clean energy platform provider LevelTen Energy. "These are issues that will take time to resolve, however some initiatives have already started in Europe led by the European Commission and some other specific regional authorities," says LevelTen Energy customer success manager Gabriel Umaña Gómez.

The usefulness of PPAs as a way to reach greening targets is destined to widen their appeal for corporates, utilities and entities of all sizes. PPAs are currently the gold standard compared with most other forms of corporate energy greening, for example renewable energy certificates. This fact alone should drive PPA markets through the current challenges to emerge stronger than ever in the 2030s.

With energy crisis investors sought short-term PPAs

Headquartered in the UK, RES is active in the PPA market, both as a wind and solar developer and as an asset manager. The company regularly negotiates PPAs with utilities, traders and corporates.

Stuart Lunn, commercial director for EMEA at RES, has seen recent interest from investors in shorter-term PPAs, allowing more power price exposure together with balance sheet financing of projects. "The level of volatility we've seen in wholesale pricing has been really significant. Everyone's aware of the electricity pricing increases we've seen since 2020, and that has obviously had a very big impact," he says.

"One thing we have seen is that a lot of asset owners are now seeking a greater degree of merchant exposure across their portfolios," says Lunn, adding that owners sometimes prefer to initially balance-sheet finance renewable projects, putting in place a 1- to 2-year PPA to take

tional 10-year (and occasionally 8-15 year) "fixed price" PPA contract is sometimes preceded by a short-term PPA. Those opting to enter into a short-term PPA won't necessarily see it as the long-term strategy for the relevant wind project. In some cases, owners will seek to aggregate several operational projects together for a higher volume long-term PPA tender, or bid them jointly into a corporate PPA (CPPA) auction. "There is a benefit to marketing larger volumes in one go," says Lunn.

"Whereas a long-term PPA might have been an absolute requirement for asset owners in the past, we see a number of them looking across their portfolio as a whole and saying, 'I've got a certain

last year. He predicts certain EU regulations, like additional price caps, could also dampen recent seller interest in shorter-term PPAs.

Also, Lunn adds, volatility itself will drive the buyer argument for the 10-year PPA, and lower power prices expected in Europe, forecasted by certain industry sources, may also mean demand for 10-year utility PPAs and CPPAs rises.

With its origins in 1990s Germany, PNE AG is a wind power owner, developer and operator active in Europe, North America, Asia and Africa. Head of energy supply services and PPA management Nils Kompe agrees, "In markets without feed-in tariffs, longer-term PPAs of 10-plus years are still the standard for the realisation of renewable energy projects."

Only in European post-subsidy markets has Kompe seen the short-term trend. "However, in markets such as Germany for example, where the subsidy mechanism includes a step-out option and an increasing number of post-subsidy projects enter the market, we observe a broader range of different PPA – terms ranging from 3-5 years," he adds.

In Spain where PPA markets are booming but long-term PPA prices are lower, a similar trend is observed with sellers targeting shorter PPAs, but there it may be more of a chance for developers to escape expected price cannibalisation in the long term.

Director, renewable energy project finance at Dutch bank Rabobank Stefan Hogewoning says he is seeing short-term, 3- and 5-year PPAs agreed for



advantage of the relatively high wholesale price and try to refinance with banks under a long-term PPA after a couple of years of operations.

This aligns with what Pexapark found in its European PPA Market Outlook 2023 report. Due to higher PPA pricing, IPPs have started prefinancing renewables on an equity basis, and later refinancing them on the basis of portfolios of assets with long-term revenues to gain positive portfolio effects.

The owner appetite for greater power price exposure means that the tradi-

number of projects with fixed pricing in place already, so now I can start adding more merchant exposure across my portfolio. I can have a balance of fixed versus merchant revenue exposure, and I get the benefit on some of those projects from higher pricing.' That's really been the feature for the last two years," Lunn says.

But Lunn observes that, while some owners and developers are still looking to strategically add merchant exposure across their portfolios, long-term PPAs will likely regain prominence as power prices have come down from their highs

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Stuart Lunn, RES



solar PV projects with the obligation to either refinance or repay the financing at years four or five from construction completion. This lets projects decrease their cost of funds and possibly negotiate a better PPA price. “We still see reports of PPAs for longer tenors, but we also see, for example in Spain, where the expectation is that the capture rates for solar are decreasing, that parties are structuring PPAs on a shorter tenor to refinance or re-leverage based on new PPAs being signed, and in order to avoid the big price reductions in the later years, so in years seven to nine,” he says.

For example in Spain, the PPA price for a 10-year PPA is significantly lower than for a 4- or 5-year PPA, so the developer could expect that the PPA discount when a short-term tenor expires will be much less than what is currently predicted.

Banks also look favourably on the re-financing of projects in Europe initially financed with short-term PPAs. “If you have a shorter-term tenor, it could be that the debt-sizing itself could be impacted, it may potentially even be slightly higher. It is sort of easier for the bank in case the refinancing doesn’t work. Banks will generally look at how fast after that refinancing moment they could be out of the deal, subject to reasonable electricity prices,” says Hogewoning. “They would take the risk on a shorter-term (initial) PPA, and then sort of roll it over for the

“It is sort of easier for the bank in case the refinancing doesn’t work. Banks will generally look at how fast after that refinancing moment they could be out of the deal, subject to reasonable electricity prices.”

Stefan Hogewoning, Rabobank

next period. From a lender’s perspective, that means that the structures that we’re offering are also different.”

LevelTen’s Gómez noted in Europe there had been a slight decrease in average tenor over the past year, from “developers who have seen that banks financing short-term projects may prefer this because it gives them more flexibility with the different routes to market [such as] merchant, CPPA, auction” and turning away from cheaper long-term PPAs when energy prices increased. In the

first quarter of 2023, average wind PPA tenor length (Q1) fell year-on-year to 10.6 years, down from 12.3 years. Solar PPA tenor length dropped slightly less, according to LevelTen.

Pexapark calls the short-term PPA “the risk management play of the decade” in its 2023 Industry Survey, noting that the market is evolving towards a mix of sales strategies that do not involve just one asset, gaining a focus on minimising hedging and liquidity costs through a mix of long- and short-term hedges.

“The ability to be alert, and have the tools to assess dynamic opportunities as they appear, mirrors sales strategies of the incumbent energy players, who have operated on a merchant basis for decades. Adoption of such a practice from renewables is a testament of the sector’s maturity and evolution,” writes the company’s senior insights analyst and content manager Maritina Kanellakopoulou.

The utility of short-term hedging

Developers and investors in Europe are not the only ones who are seeing the advantage of a short and sweet PPA in today’s dynamic price environment.

Utilities and traders appreciate shorter-term PPAs to help avoid rising hedg-

ing costs. “The challenge is usually the cost of hedging,” Lunn explains, adding, “Because there’s so much price volatility in the markets, as you go further out on your PPA term and you’re fixing for longer and longer, the cost of collateral and the cost of hedging becomes very significant and that has an impact on the pricing of PPA contracts.”

Lunn estimates that short-term PPAs won’t remain utilities’ default choice and says in some European markets more have been choosing 10-year fixed price PPAs lately. “As volatility decreases, we’re hoping that fixed-price contracts from utilities and traders will become longer and more prevalent in the market, and then that can only be a good thing in terms of wider competition versus government auctions versus corporate PPAs,” he concludes.

Norway-headquartered assurance and risk management company DNV advises buyers, offering utility PPA and CPPA contract due diligence across Europe, the Middle East and the US, in addition to helping developers find a route to market through PPA tendering.

Jakub Pilc, DNV principal consultant, PPAs, for EMEA sees three main differences in buyers’ approaches to tenors. “With the rising popularity of PPAs, many corporate buyers are now thinking in terms of the wider tenor of up to 10–12 years, and they commonly accept this as one of the requirements for corporate PPAs.

“Many corporates would like to consider shorter tenors when available. Shorter contracting is driven by shorter time periods for budgeting requirements, as well as the commitment to sustainability programs with a horizon up to 2030,” he adds.

In a final trend on tenors, Pilc sees corporate buyers who are rather risk-averse looking at the 5-year PPA as the first step on the rung of the ladder to a PPA covering the entire demand portfolio.

“Many corporates would like to consider shorter tenors when available. Shorter contracting is driven by shorter time periods for budgeting requirements, as well as the commitment to sustainability programs with a horizon up to 2030.”

Jakub Pilc, DNV

In terms of utility PPAs, the 10-year tenor is common, but DNV also sees a 3- or 4-year PPA used by utilities seeking price hedging contracts. “When it comes to periods shorter than five years, we’re asked what the advantage of PPAs over trading on the exchange is, Pilc explains, continuing, “I think it’s easier to mitigate risk on short-period utility PPAs thanks to more price transparency over the tenor of the contract, so the termination amount can be marked to market.

“When we are talking about utility PPAs, pricing mechanisms have become more sophisticated than before. Part of the generation, for example, 70–80 per cent could be hedged at a fixed price, while the remaining volume would be linked to the spot price. Pricing formulas are becoming [more] complex to achieve the capture price as planned,” Pilc says.

Global professional services firm EY offers PPA services for both PPA buyers and sellers, including M&A support and offtaker renewables strategy advice, as well as PPA procurement and accounting treatment expertise. It releases a PPA index twice per year highlighting the world’s best countries in which to sign CPPAs.

Phil Dominy, director, energy and infrastructure at EY in EMEA says when wholesale power prices shot up during last year’s crisis, he did see “a bit more” appetite for two-year PPAs from utilities to cover the gap in hedging of power





costs before the start of a long-term PPA with a newbuild wind farm. EY sees some utility buyers continue to fill this gap with competitively priced PPAs, so-called “bridging PPAs” from operational assets, sometimes with the same developer that is going to offer them a new-build wind farm.

But he notes a more recent move away from shorter tenor PPAs amid a relaxation in power prices. Corporate buyers are back to hedging using monthly or seasonal forward power purchases without a short-term PPA during that two-year period. Dominy explains, “For corporates, they’d rather just hedge short-term as they used to do.”

Despite these tenor trends, EY sees that most newbuild wind farms in Europe are still in need of minimum 10-year PPAs. “Roughly, ten years ago almost all PPAs were 15 years or more. Now, they’re almost all ten years, so that trend has come down for newbuild projects. If [PPA buyers] are happy to take an existing asset, I’ve done 5- to 7-year PPAs, but it’s very rare to see a developer able to raise debt finance on a new-build project if the PPA tenor is less than ten years and because most corporates want that

additionality, they also don’t want less than a 10-year PPA tenor,” says Dominy.

Who owns the commodity price risk?

While buyers and sellers share the goal of the keeping the PPA in place for the construction of a wind farm, some PPA parties are re-examining the way wind supply chain commodity price risk is allocated between seller and buyer in the PPA agreement.

Tom Buttgenbach, CEO of 8minute Solar Energy, speaking in a Norton Rose Fulbright panel in August on the US market, shared the view that “the commodity price risk needs to be taken by the offtaker” because the developer is specialised in construction while some offtakers, utilities for example, already take a long-term view on commodity prices. “I have found more sympathy for that argument for future projects, which is easy today in a seller’s market with available projects in short supply,” said Buttgenbach

Michael Rucker, CEO of Scout Clean Energy, also speaking in the Norton Rose

Fulbright panel, said he had seen PPA contracts with “reopeners” providing the parties with a chance to meet to discuss how to cover commodity price inflation risk.

Reopeners are not the only way that parties can show more caution. Force majeure clauses related to regulatory changes have been seen since last year’s price caps in Europe. DNV’s Pilc says, “The three most pronounced risks I see are credit risk considering the changing creditworthiness of contracting parties, force majeure risk given the rising risk of pandemics as well as the risks associated with a changing legal framework in the context of the energy transition. These three elements are important to acknowledge to mitigate the risk of defaults,” Pilc says.

Pilc says that buyers often insist on rigid early termination conditions to protect themselves in case of delays in project commissioning by developers. They want to be able to exit a PPA when a de-

Force majeure clauses related to regulatory changes have been seen since last year’s price caps in Europe.

layed wind project, for example, is not complete or is partially complete.

Hogewoning also points to PPAs covering commodity price risk with CPI indexing links. “That started maybe a half-a-year ago and they’re becoming more common. I think that probably has to do with the fact that inflation has become such a big topic. And actually, manufacturers do the same in their supply contracts now.”

Dominy observes that indexation has been through “a few cycles.” He says last year, when commodity price inflation was really taking off, a lot of developers started to refuse any non-indexed, flat-priced PPAs because they were worried about their supply chain and O&M costs

going up relative to their revenue while CPI indexation in Europe “went crazy”.

“As inflation is already coming down here, there are some developers now who are willing to take a ‘flat nominal’, so non-indexation pricing. As well as ‘flat nominal’ prices and PPAs indexed against CPI, some corporates prefer a fixed escalation of prices per year,” he says.

Now, non-indexed pricing is poised to make a comeback. “I think we’re seeing most developers willing now to accept non-indexation pricing, but obviously, the corporate will pay a premium price for that. But when the corporates are willing to accept indexation, then there may be an agreement for an annual indexation price cap,” says Dominy, explaining that uncapped CPI indexation makes corporates nervous about their budgeting.

To baseload or not to baseload?

In Europe, sponsors are facing more issues now with baseload contracts in an environment where they have very high prices and intermittent generation from wind and solar, but baseload contracts have not ceased entirely. Pay-as-produced PPAs are rising in popularity.

Speaking at Tamarindo’s Financing Wind conference in May, German bank NORD/LB’s head of origination energy Europe Niels Jakeman said there could be a way to structure a baseload contract for

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Phil Dominy, EY

wind by using different types of assets. “You’d look at it, perhaps in portfolios with a few other assets of different asset types — so solar, wind, storage — and get greater confidence that you would be able to secure that level of baseload price. I think, as a portfolio maybe with some other types of offtakes and on a relatively modest level, it probably could still work, but I’m not aware of any active in the market right now,” said Jakeman.

Law firm DLA Piper head of sustainability and ESG Natasha Luther-Jones, speaking at the same event, said that some sponsors and had successfully renegotiated PPAs taken out right before the war in Ukraine. Some virtual or physical PPAs were able to increase the price, or in the case of a baseload PPA, reduce output to less than 50 per cent of project outputs. She says her firm has seen a lot of renegotiations of signed PPAs, although none of them had contractual rights to

renegotiate. Offtakers were generally willing to negotiate because of the need to preserve the project.

Rabobank wrote in a report last year that developers of wind and solar farms were becoming more cautious on hourly baseload PPAs and were taking a step back from fully merchant models. It predicted “an increasing price discount for pay as produced—versus baseload PPAs.”

“Next to price cannibalisation, asset owners will likely apply a higher price tag for owning the shape risk. Thus, as more and more wind and solar PV assets are deployed, we will see an increasing price discount for pay-as-produced PPAs compared to baseload PPAs,” it said.

EY’s Dominy says the pay-as-produced PPA is the most popular structure in Europe, as last year shaping costs went up “hugely” and baseload PPAs cost a lot more. Corporates in Europe’s deregulated power markets now rely mostly on pay-as-produced and virtual PPAs. Dominy explains, “Pay-as-produced and virtual PPAs are probably the vanilla now, in most of Europe anyway.” He says shaping costs are already coming back down, however, as volatility and power prices decline.

Even so, EY in EMEA has seen major corporate clients like UK telco giant BT Group opt to combine wind virtual PPAs and a solar virtual PPA to obtain the best profile. Assisted by EY, BT has signed PPAs with three UK wind farms in the past two years, targeting net-zero.

EY recommends that large corporates combine solar and wind PPAs to avoid the buyer relying on a utility baseload and incurring a significant aggregator margin. It suggests this as a ‘gold standard:’ a pseudo 24/7 baseload contract to lower exposure to profile risk as well as being greener, due to reducing the reliance on fossil fuel power to fill the gaps, says Dominy.

But for most major corporates, investing in several PPAs to create a pure 24/7 shape that matches generation perfectly to demand is still hard to justify. This is because it requires a huge load, the kind more likely to be needed by a major tech company. “The 1% of corporates — the Metas, the Amazons, the Mi-



crossfits – those that are massive and have so much load – could do multiple different PPAs and have deep enough pockets to manage a ‘platinum type’ PPA from multiple technologies and assets. It’s less relevant for most corporates as they just can’t achieve that sort of scale. So when we do a simpler combination of wind and solar, we’re not trying to match exactly hour-by-hour 24/7 – we’re going for gold rather than platinum,” says Dominy.

Speaking from the bank perspective, Høgewoning says, “Where we’re doing more financial PPAs instead of more physical PPAs, it might be easier to structure, but that would mean that the developer of that project still needs to arrange the physical sale of the electricity.”

Rabobank has seen the emergence of “solar-shaped baseload” PPAs to combat the PPA-price reduction of the expected profile effect due to cannibalisation in Spain for offtakers in pay-as-produced PPAs. “It’s also definitely an issue which, at the moment, is less of an issue because prices are relatively high, higher than what we’ve seen in the past and that mitigates it, but the risk is definitely very much on the radar and for fixes seen in ‘solar shaped baseload’ PPAs, but are based on the hourly expected production, which remains a challenge for banks.”

RES in Europe finds that shape risk allocation is a rising discussion topic for

corporate offtakers. “We do have more and more conversations during CPPA negotiations around allocation of shape and availability risk, much more than we did in the past, but unless [you as the developer are] an owner of a very large portfolio of assets, and have access to a trading partner who can help you shape that risk, it’s more likely in our view that

“The 1% of corporates – the Metas, the Amazons, the Microsofts – those that are massive and have so much load – could do multiple different PPAs and have deep enough pockets to manage a ‘platinum type’ PPA from multiple technologies and assets.”

Phil Dominy, EY

shape and availability risk is better borne on the buyer side of the contract,” says Lunn.

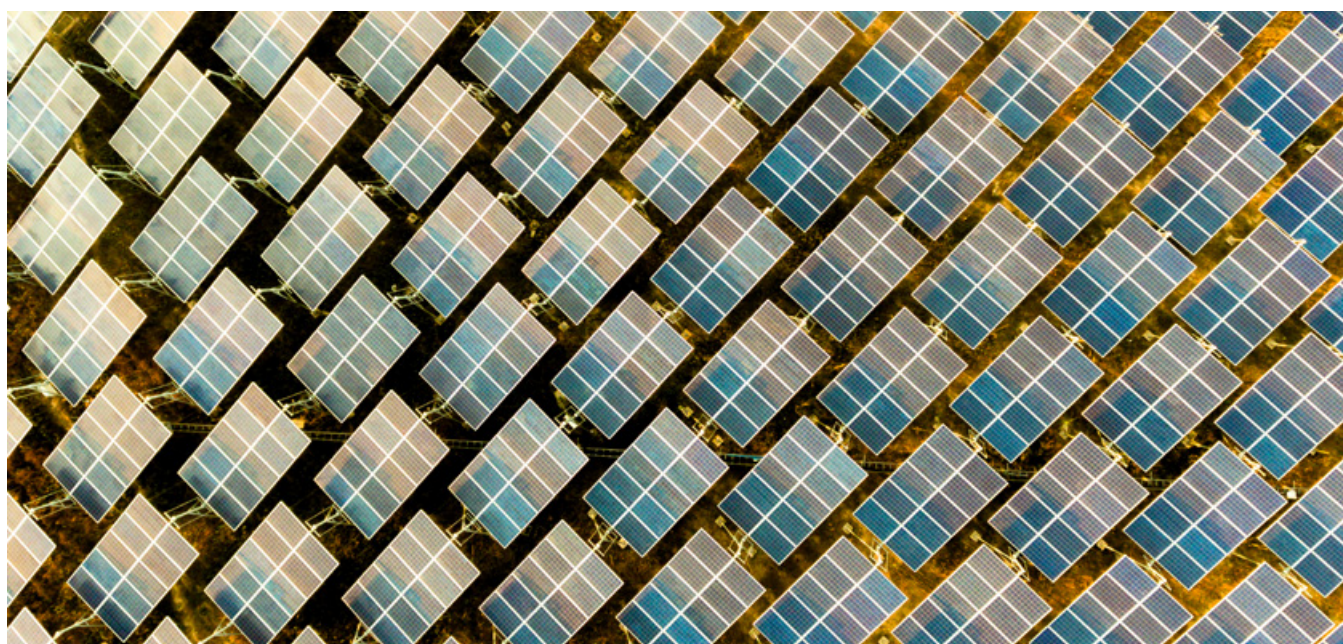
This is because the utility or corporate offtaker can more efficiently trade volume imbalances.

Cannibalisation and market future

Despite the many emerging risks for parties, demand for PPAs will stay strong amid rising renewable targets over the next decade, players predict, but markets will still face volatility. Last year Rabobank predicted that as renewable penetration rises, “[power] prices are expected to decrease on average while simultaneously becoming more volatile.”

Lunn points out that the certainty of electrification in Europe gives reason to hope that price cannibalisation is a temporary market distortion. “I think the market will, to some extent, correct for it. If you imagine that you’re going to have large amounts of wind generating at a given time and the pricing is coming down, given the amount of electrification for the heating industry and use of green hydrogen, those elements will ramp up significantly in response to those lower prices, and it will mitigate the impact of that cannibalisation,” he says.

In the medium-term, wind and solar price cannibalisation means the need





for PPA parties to negotiate is far from over. “If the market continues to come down and become cannibalised, the PPA prices will need to come down as well. Otherwise, there will be no economic traction for a corporate entering one. So, I think that there will be a challenge for developers coming out with new projects – they’ll need to see how they can trim their supply chain costs to keep the PPA price competitive against falling wholesale markets,” says Dominy.

Another fundamental change for PPA pricing on the horizon is EU electricity market reform. EU reforms foresee the decoupling of renewable and fossil fuel power markets as well as a move towards sub-national, or nodal, power pricing. Dominy predicts, “[Nodal pricing] will certainly change PPA economics because the market will change once you go regional. So rather than country-wide pricing, we’ll begin to see more nodal or regional price pricing that will incentivise generation closer to where it’s consumed.”

Commenting on a leaked draft of the proposed EU electricity market reform in March, LevelTen’s senior manager in analytics Plácido Ostosi said it supports fixed-price PPAs as a way of bringing down energy prices, for example by allowing developers to bid into CfD auctions for projects that already have a PPA. Ostosi called this “an exciting step, as it provides additional flexibility and routes to market for developers.” But he added PPA players were pleased that the

EU apparently scrapped a proposal by Spain requiring developers to gain CfDs for all new wind and solar farms, noting that it would discourage CPPAs.

Overall, Ostosi recommended the EU do four things to help avoid price cannibalisation: enact financial instruments that reduce the risks to PPA offtakers, provide financial support, remove limits on cross-border and cross-zonal trans-

“If the market continues to come down and become cannibalised, the PPA prices will need to come down as well.”

Phil Dominy, EY

mission and increase the use of PPAs for SMEs, for example through preferred treatment in auctions.

Hogewoning believes that EU electricity market reform will be positive for PPA project development, with CfDs supporting revenues and with governments potentially being able to guarantee the credit risk of the smaller offtakers. That added liquidity from smaller offtakers would help to get more wind and solar projects linked to PPAs moving. Gómez


at LevelTen Energy also noted in Europe smaller offtakers were interested in all types of PPAs, but he did not say he had seen aggregated PPA transactions being carried forward.

To spur the popularity of PPA contracts, Pilc also believes the EU must fast-track permitting process to increase renewable projects in the pipeline, build flexibility markets to bring more variety to PPA contracts and add more PPA pricing resources to better manage pricing and market risk. Pilc also strongly supports the development of PPA indices to build better contracting standards and help the market advance, noting PPA contracts traded on exchanges would help players make better investment decisions.

On flexibility, Pilc cautions, “Until we have widely implemented battery storage or hydrogen infrastructure to store sufficient renewable energy, there is a good chance we will see cannibalisation progressing and impacting investment decisions.”

Pexapark’s COO Pedretti, speaking in a March interview with S&P Global, agreed with the concept that batteries were an answer to increase capture rates, predicting the rise of so-called “hybrid PPAs.”

European PPA market observers are mostly rooting for the reforms ahead, watching and waiting to see what comes to the fore in shaping PPA markets over the next couple of years. ■



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DEVELOPER Q&A

PNE's Nils Kompe

German IPP PNE's global development pipeline of wind and solar reached over 9GW last year, and it considers PPAs for projects not just in Europe but also in markets such as South Africa and Canada.

With its 30-plus-year track record in wind development, PNE supplies companies with PPAs mostly using its onshore wind project pipeline, for which it increasingly owns and operates, in Germany, counting 23 owned wind farms with a total capacity of 320MW. It is looking to grow its owned portfolio this year.

This enables the developer to deliver "relevant PPA volumes" while also remaining focussed on PPA potential and O&M for its non-owned European pipeline of over 2.5GW, says head of energy supply services and PPA management Nils Kompe.

FQ: Are large corporations still the main buyers for wind PPAs in all of your regional areas?

NK: It is true that large companies besides the major suppliers and energy traders play an important role in the PPA business, but more and more small and medium-sized enterprises are entering the PPA market. They increasingly rely on wind PPAs to diversify their energy mix and meet their sustainability goals. This development is very encouraging as it shows that the renewable energy market is maturing.

FQ: How and where are power price rises and price caps impacting or changing contracting practices with wind CPPA offtakers?

NK: Power price increases and price caps can have a significant impact on contracting practices with CPPA offtakers. The current high market price volatility creates uncertainties that complicate negotiations around PPAs. In particular, finding a fair price in the face of constantly changing market conditions is a challenge. PPA negotiations are already time-consuming, and this added uncertainty can make the process even more complex.

Price caps can additionally add to the uncertainty at the regulatory level. They can create hesitation among stakeholders and lead to delays in decision-making processes.

We have observed greater diversity in the pricing structure of PPAs.



Long-term planning certainty is crucial for wind power operators, and unexpected changes in legislation, such as the introduction of price caps, can have a major impact on the economic viability of projects. In such volatile times, it is crucial that we work closely with our partners and find flexible solutions to overcome the challenges and still realise sustainable and profitable projects.

FQ: Have you seen any new contracting practices emerging in the past year?

NK: Indeed, we were able to see some notable changes in contractual practices for PPAs the last year. In Europe in particular, we have observed two main trends.

First, the demand for financial PPAs has increased significantly. Such contracts are particularly attractive to multinational corporations that want to reduce their carbon emissions while hedging the risk of price volatility in the energy market. Financial PPAs allow them to do this by fixing the price of the energy produced over a fixed period of time.

Second, we have observed greater diversity in the pricing structure of PPAs. This ranges from collar structures, where a minimum and maximum price is set, to specific price profiles based on the individual needs and risk tolerances of buyers. This type of flexibility in pricing can help increase the attractiveness of wind PPAs and allows parties to tailor solutions that meet their specific needs and objectives.



FQ: Are you seeing price cannibalisation impact wind PPA prices and do you expect any solutions to the price cannibalisation to come around?

NK: In terms of solutions to price cannibalisation, there are several approaches that are currently being developed or implemented.

Joint development of solar and wind projects, which leads to higher efficiency and full load hours via the development of energy storage, can take in surplus energy when supply exceeds demand. As well, flexible power tariffs and demand-side management allow supply and demand to be balanced in real-time. This can help to smooth peaks ... Power-to-X solutions, which convert surplus renewable energy into other forms of energy such as hydrogen or heat. PNE is active in all these areas.

These technologies are particularly promising as they can not only help stabilise power prices, but also open up new markets for renewable energy. All these solutions are developing rapidly and we expect them to play an increasingly important role in addressing the challenges of price cannibalisation in the coming years.

FQ: Can you comment on any regulatory developments, for example the proposed revisions to EU electricity market design, with possible new rules for CfD auctions and PPAs?

NK: Regulatory developments, especially at EU level, can have a significant impact on the market for PPAs and CfD auctions. There are several proposed changes currently under discussion, and although the final outcomes are still unclear, there are some points I want to highlight positively.

There are proposals to introduce [state-funded] PPA measures as credit support for CPPAs. This could help to mitigate the risk for companies and at the same time increase the attractiveness of PPAs as a financing instrument for renewable energies.

It is essential that a future tariff system must ensure that PPAs can be imple-



mented in a meaningful way so that the supply of green power to the market [through PPAs] can continue to take place at volumes needed, as well as in an efficient manner.

It is important to keep an eye on the progress of these regulatory developments as they may have a significant impact on the renewable energy market. At PNE,

we are closely monitoring these developments and adjusting our strategy accordingly to ensure that we can continue to offer the best solutions to our customers. ■



Decreased volumes are not the key takeaway

The year's first quarter saw a total of 5.5GW of disclosed contracted volumes, spanning 68 deals, setting a vastly unprecedented record in Europe's PPA Market. Could Q2 2023 top this record? The short answer is no. But there's more than meets the eye. Pexapark explores.

Q2 started with an early indication of a slight slowdown of activity in comparison to February and March, which were particularly generous in deal closures and announcements. **April saw 17 deals of at least 962MW new volumes added on our PPA Tracker.** Disclosed volumes reached their lowest levels since September 2022. The largest deal came from Portugal – a relatively small PPA market overall – after Norwegian utility Statkraft agreed to offtake the entire output (341GWh per annum) of NextEnergy Capital's currently under construction 210MW solar portfolio for an unknown tenor.

May saw an uptick in deal count with 19 fresh announcements of 980MW. A highlight – even though it didn't contribute to aggregated volumes – was a conditional PPA between Statkraft and hydrogen project developer Fortescue Future Industries in Norway. The technology and the associated volumes of the PPA were not disclosed, but still marked one of the first PPA deals of its kind, where the offtaker is a project developer. The agreement is set to feed FFI's potential 300MW Hemnes green hydrogen and ammonia facility, which is under evaluation due to the high industrial potential in the area.

In June [2023], even though the quarter ended with a total of 24 deals – the highest monthly deal count of Q2 – disclosed volumes took a drop to end at 673MW – the lowest monthly volumes of the quarter. This is highly attributed to the fact that more than seven deals revealed limited volume details. Our highlight pick for the month was an EU-first Hybrid PPA for a solar-plus-storage PPA in Great Britain. DIF Capital Partners and offtaker Engie signed a 10-year PPA for a 55MW subsidy-free solar farm, and a 10-year optimisation contract for a

40MW/80MWh co-located battery storage asset. Pexapark was proud to support this first-of-its-kind deal, opening a precedent for further innovation in the renewables-plus-storage PPA sphere.

PPA activity: The big picture

All in all, aggregated contracted volumes in Q2 halved in comparison to Q1, amounting to approximately 2.6GW. Deal count remained vastly on similar wavelengths, with a total of 64 PPAs announced – a 5.8% quarter-on-quarter decrease. Despite the minor decline, the deal count size remains exceptionally high. Such numbers bring H1 2023 to 8.1GW and 131 deals. To put these numbers in context, the volumes seen in H1 2022 amounted to 4.3GW across 68 deals. Overall, 2022 saw 11GW across 162 announcements, which means that, so far, Europe has achieved at least 73% of last year's overall volumes, and 80% of deal count. Therefore, it's statistically certain that our prediction that 2023 would mark an unparalleled achievement for the European PPA market will materialise.

PPA activity: Technologies

Solar dominated activity for a second quarter in a row, with 30 deals amounting to at least 1.1GW of volumes. Onshore wind comes second, with 11 deals of roughly 500MW – three of which Finland, with two chemicals and one Information Technology (IT) corporate offtakers. Offshore wind kept attracting significant attention, with a total of six PPA announcements of 437MW volumes.

PPA Price Trends

On the PPA pricing front, Q2 2023 kept being defined by a downward trajectory as energy-related commodities continue their recovery from last year's hikes.

Overall, though, the decline seems to be stabilising as the quarter-on-quarter aggregated decrease in Q2 appears lower than the one witnessed in Q1.

Specifically, our signature PEXA EURO Composite dropped 14.5% quarter-on-quarter. All technology indices saw similar range drops, with PEXA Solar closing the quarter at -14.8%, PEXA Offshore wind at -16.5% and PEXA Onshore Wind at 13.2%.

On a country level, the Netherlands experienced the steepest decline with an overall 26%. Following second is Germany with a quarterly decrease of 17.4%, with Italy right after at -15.2%. On the other hand, Nordics (-5.8%) and Poland (-7%) experienced the lightest percentage rate change.

Qualitative Highlights:

- 1. Corporate competition increases:** In some recent sale tenders Pexapark managed, we witnessed some notable oversubscriptions of up to 4x from offtakers, indicating exceptional interest from the corporate market.
- 2. Decreasing market-based prices conflict with high development/construction and financing costs:** Inflated Capex due to high supply chain costs and spikes in interest rates are challenging project owners as market-based pricing follows a downward trajectory.
- 3. New technologies are further penetrating Europe's PPA Market:** PPAs set to feed upcoming green hydrogen and associated derivatives like green ammonia, as well as PPAs leveraging the power of flexibility through storage assets, are making small but heavily impactful steps towards the mainstream. ■

Pexapark, a renewables portfolio enterprise software and advisory company, acts as a reference for buying, selling and managing renewable energy, having assisted in more than 25GW of renewable PPA transactions.

EU PPA activity and price trends



PPA % price change

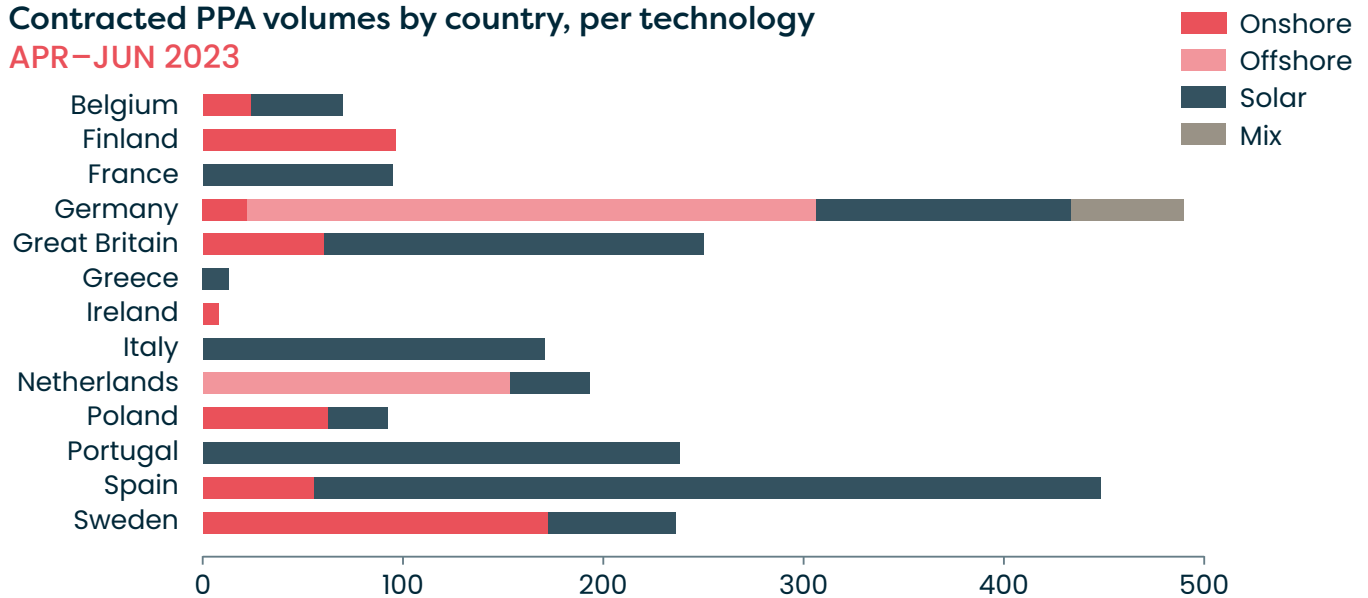
Mar 2023	Apr 2023	May 2023
-6.2%	8.1%	-10.70%

Pexapark's PPA Trends Methodology

Data have been provided by Pexapark's [Price Reference Platform](#). The PEXA Trends family, in the form of percentage rate changes, provides an aggregated glimpse of the evolution of 10-year Pay as Produced (PAP) prices, based on a rolling average of the front- and second-year starting contracts. PEXA EURO Composite is the weighted average of all technologies and countries. Country indices represent a weighted average of all technologies in the jurisdiction. The indices – where percentage changes derive from – are recalculated daily using Pexapark's valuation models based on the forward curve, and transacted pricing evidence when available. If you're interested in accessing frequent PPA pricing and deal making commentary, register for a free account.

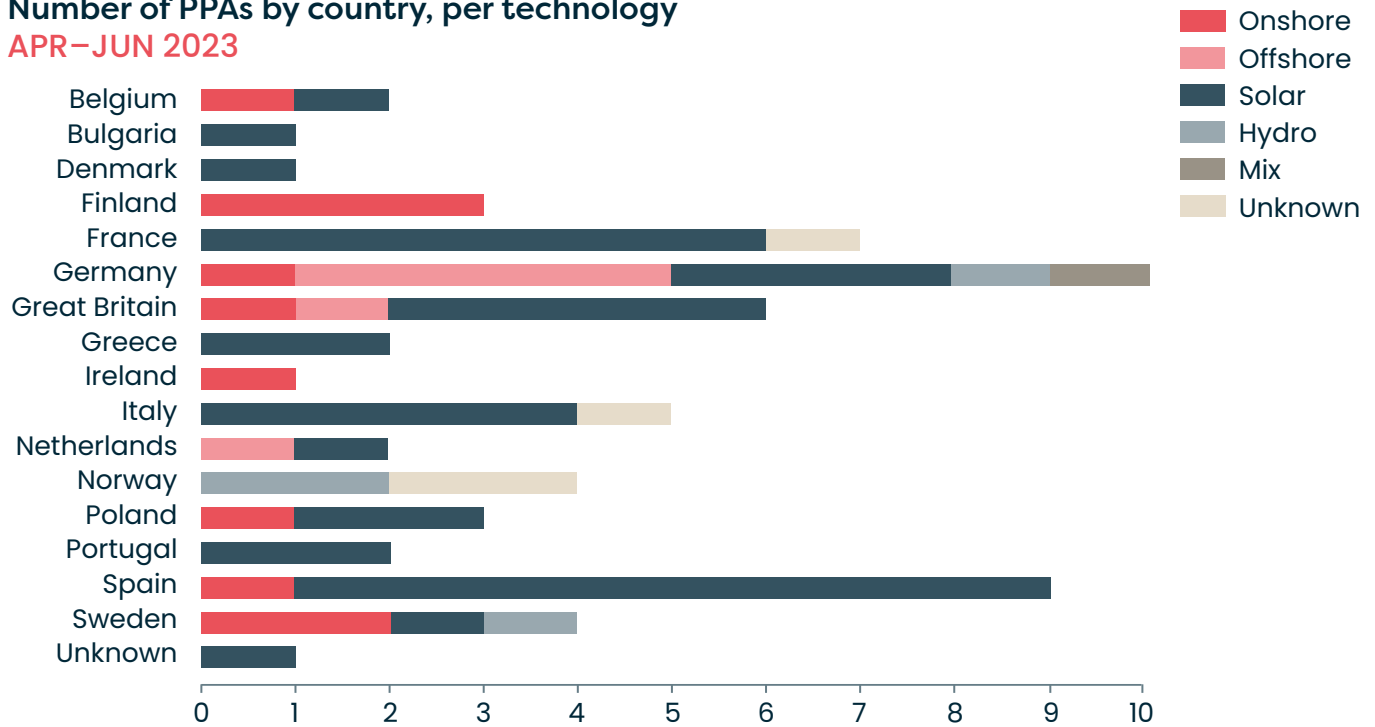
Contracted PPA volumes by country, per technology

APR-JUN 2023



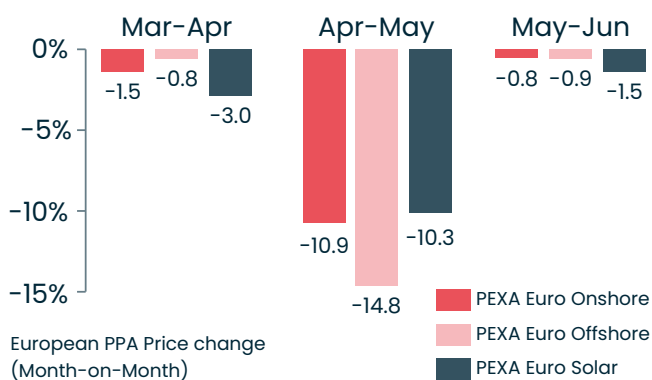
Number of PPAs by country, per technology

APR-JUN 2023



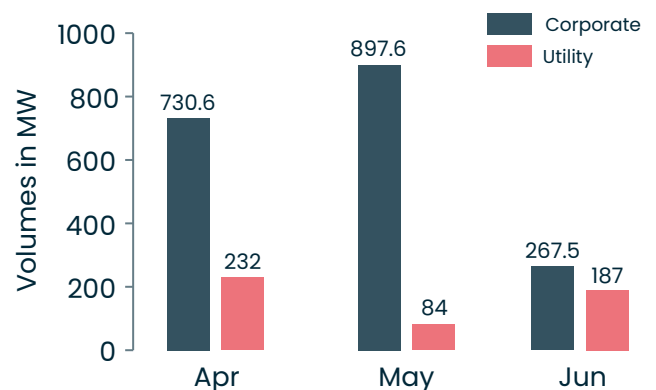
PPA price trends, by technology

APR-JUN 2023



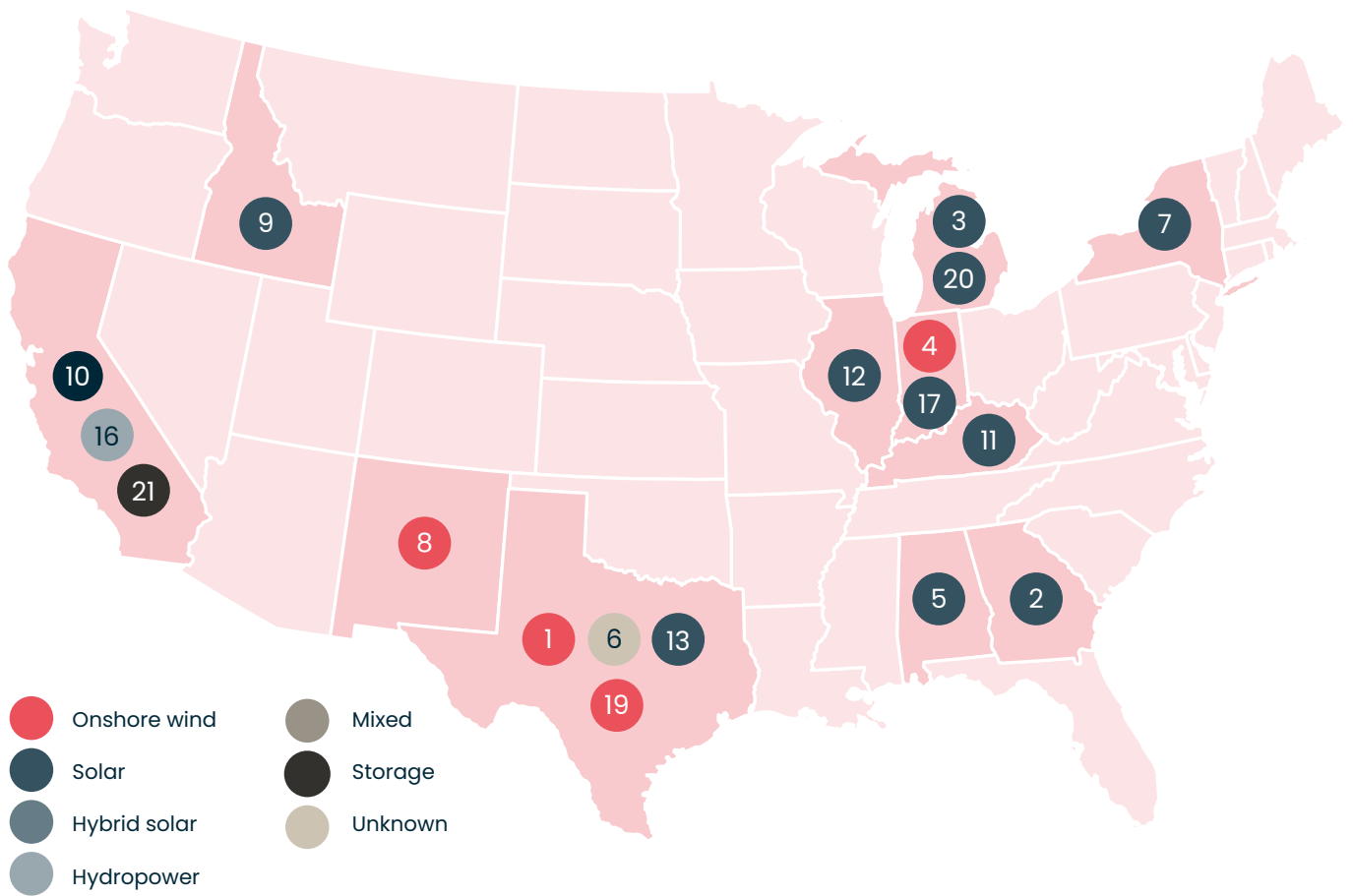
Volumes (MW) by offtake type

APR-JUN 2023



US PPA activity

Selection of key deals in the market



Location		Buyer	Seller	PPA Size (MW)	Tenor	Offtaker Type	Technology
1	Texas	Google	Ørsted	150	15	Information Technology	Onshore Wind
2	Georgia	Indiana Michigan Power	EDF North America	180	30	Utility	Solar
3	Michigan	Indiana Michigan Power	Savion	100		Utility	Solar
4	Indiana	NIPSCO	EDPR	198	20	Utility	Onshore Wind
5	Alabama	Toyota Alabama, Toyota Tsusho America	Huntsville Utilities	30		Automotive	Solar
6	Texas	Multiple	Recurrent Energy	100	16	Multiple	Unknown
7	New York	AT&T	DSD Renewables (DSD)	15.5		Telecommunications	Solar
8	New Mexico	University of California	Pattern Energy	85		Education	Onshore Wind
9	Idaho	Meta (Facebook)	rPlus Energies	200		Information Technology	Solar
10	California	Imerys	TotalEnergies	15	25	Capital Goods	Hybrid Solar
11	Kentucky	Toyota Motor North America	Savion	100		Automotive	Solar
12	Illinois	Nouryon	Convergent Energy and Power	2	30	Chemicals	Solar
13	Texas	Covestro	Ørsted	90	15	Capital Goods	Solar
14		Micron Technology	Terra-Gen	178	15	Consumer Durables	Onshore Wind
15	PJM wholesale electricity market	Iron Mountain	Rye Development	150	10	Information Technology	Hydropower
16	California	Sonoma Clean Power Authority	Idemitsu Renewables	84		Utility	Hybrid Solar
17	Indiana	Duke Energy	Ranger Power	199	20	Utility	Solar
18		Amazon	Acciona	192		Information Technology	Solar, Wind
19	Texas	CVS Health	Direct Energy			Retail	Onshore Wind
20	Michigan	CVS Health	Constellation			Retail	Solar
21	California	Southern California Edison (SCE)	Leeward Renewable Energy (LRE)	126	15	Utility	Storage

Remarks on notable deals

1	Texas	PPA linked to the 268MW Helena Wind Farm located in Bee County, Texas. Project commissioned in mid-2022.
2	Georgia	PPA linked to the 180MW (236MWdc) Sculpin Solar project, in the county of Dekalb. Expected COD in Q4 2025. Michigan Power (I&M) will also purchase 100% of the equity interests in the 245MW (318MWdc) Lake Trout Solar project under a Purchase and Sale Agreement.
3	Michigan	PPA linked to the 100MWac Elkhart County Solar Project, in Indiana. Expected COD in Q4 2025.
4	Indiana	PPA linked to the 198MW Carpenter onshore wind project in Jasper County, Indiana. Expected COD in 2025. EDPR revealed Northern Indiana Public Service Company (NIPSCO) will be the offtaker for a 20-year period. This is the fifth PPA between the two parties.
5	Alabama	PPA linked to a 30MW solar asset in the North Huntsville Industrial Park, surrounding the Toyota engine plant. Expected COD in summer 2024.
6	Texas	Aggregated VPPA with EMD Electronics (40MW and anchor buyer), Biogen (20MW), Wayfair (15MW), Autodesk (10MW) and an unnamed healthcare company. The virtual deal is linked to the entire output of the 100MW(ac) Liberty solar PV project in Texas. Expected COD in 2024.
7	New York	AT&T will be the anchor tenant subscriber, offtaking 15.5MW from a five-project 24.1MW community solar portfolio in Upsate New York set to produce 17.4GWh per annum. The sites are located in Cortland (5 MW), East Syracuse (2.7 MW), Medina (2.5 MW), Utica (902 kW) and Swan Lake (4.4 MW). Four sites are already under construction, with the fifth one to follow suit within 2023.
8	New Mexico	PPA linked to the 3.5GW SunZia Wind project, located in the Torrance, Lincoln and San Miguel counties in New Mexico. Construction set to begin in 2023, with expected COD in 2026. The University of California will offtake an 85MW portion, enough to meet the entire electricity needs of its US Santa Cruz, US Santa Barbara, UC Riverside and UC Merced campuses. Shell Energy North America appears to be the intermediary between the generator and the corporate offtaker.
9	Idaho	PPA linked to the 200MW Pleasant Valley Solar project, in Ada County, Idaho. Local utility Idaho Power will offtake the project's energy to then supply Meta's (Facebook) new data centre in Kuna. Construction of the project is set to commence in H2 2023.
10	California	Private-wire (on-site) PPA. TotalEnergies will install a 15MWdc solar array co-located with a 7.5MWh battery storage system in Imerys' Lompoc industrial facility in Santa Barbara County, California. The Power Purchase and Storage Services Agreement (PPSSA) will last 25 years, covering 50% of the facility's current energy needs.
11	Kentucky	VPPA linked to Savion's 100MW Martin County solar project, which is being constructed in the former Martiki coal mine. Construction set to begin in mid-2023, with expected COD in 2024.
12	Illinois	Private-wire (on-site) PPA, which will see the installation of a 2MW solar array in Nouryon's manufacturing facility in Morris, Illinois. Expected COD in H2 2023.
13	Texas	VPPA linked to the 471MW(ac) Mockinbird solar complex in Lamar County, Texas. Through a virtual arrangement, Covestro will offtake 90MW of the project's output. Expected COD in Q4 2024.
14		VPPA for around 178MW onshore wind capacity and the associated renewable energy certificates.
15	PJM wholesale electricity market	A 24/7 PPA to support the development of new hydro facilities to be integrated in existing dams without generation capacity. The deal could see the development of more than ten new hydro projects, of a total 150MW capacity. The approach has been deemed first-of-its-kind.
16	California	Long-term PPA linked to the Azalea project comprising 84MWp of solar, and 38MW/152MWh of battery storage in Kern County, California. Expected COD in 2025. Sonoma Clean Power Authority is a non-profit community-based electricity provider for the Sonoma and Mendocino counties.
17	Indiana	PPA linked to the 199MW Speedway Solar PV project in Shelby County, Indiana. Construction began in March 2023, with expected COD in September 2025.
18		Expansion of an existing 641MW PPA, bringing its total size to 833MW. Technology appears to be a mix of solar and onshore wind from Acciona's portfolio.
19	Texas	CVS Health partnered with Direct Energy, a subsidiary of NRG Energy, to buy around 100GWh per annum (and the associated credits) from an onshore wind facility in the Crockett County, Texas.
20	Michigan	CVS Health partnered with Constellation to buy 35GWh per annum (and the associated credits) from the the 800MWdc/ 592.8MWac Double Black Diamond solar project in Illinois, Michigan.
21	California	PPA linked to the 126MW Antelope Valley standalone battery storage facility, which can store up to 500MWh of power, to support grid services. The project is adjacent to LRE's 100MW Rabbitbrush and 174MW Chapparral Springs solar-plus-storage projects. Construction of the standalone battery project is set to begin in 2023, with expected COD in Q1 2024.



Investing in wind for a strong Eastern Europe

Poland, Romania and Bulgaria have changed laws to attract more wind investors, and they are looking to replace fossil fuel power amid ever-more cost and greening pressure. But constraints hold back the region.

Wind developers could play the hero's role amid a rising sense of urgency around fossil fuel use in Eastern Europe: The question is, when is the energy transition going to get serious?

Poland and Bulgaria have low dependency on natural gas for power generation (9 and 6 per cent of the mix). However, they had to improvise last year when Russia suddenly switched off natural gas supplies to both countries after disputes over payment in Roubles. Poland had prepared for years, pledging in 2019 not to renew an existing Russian gas contract.

Not just gas, but also coal used for power is becoming more of an issue. Poland still uses coal for over 70 per cent of its power needs according to Polish NGO InStrat. Russia had supplied 20 per cent of Poland's coal before Poland banned Russian coal imports in the wake of war in Ukraine. But perversely, wartime supply crunches have boosted demand for coal power in Eastern Europe, for example in Poland and Bulgaria.

To date, Polish and Bulgarian onshore wind markets are yet to see an upside from bans of Russian fossil fuel imports

to Eastern Europe. For example in Poland, IEA noted coal demand increased in 2022 and warned it must make "additional efforts" to reach its climate targets. Poland's natural gas supply has simply been sourced from friendlier exporters.

But the silver lining in the tragedy of the war in Ukraine is that public attitudes toward onshore wind are changing. Katarzyna Suchcicka, the country manager in Poland for Sweden-headquartered developer OX2, says, "During the

"During the last few years, we observed a systematic increase in social acceptance for RES investments."

Katarzyna Suchcicka, OX2

last few years, we observed a systematic increase in social acceptance for RES investments.

"Russian aggression against Ukraine has changed a lot. As a society, we have realised that renewables ensure not only cheap, clean energy, but also the energy safety. At the same time, the myth of natural gas as a transition fuel between

coal and renewable energy sources collapsed."

InStrat's head of energy & climate program Michał Smoleń, speaking at WindEurope's conference in April, said, "Public surveys show that actually more than 80 per cent of (people) polled now support further development of onshore wind power, and other surveys have seen that two thirds of those polled support a quicker transition in the aftermath of the energy crisis and Russian war in Ukraine."

In Bulgaria, adding a link to a natural gas imports terminal and expanding nuclear generation has been the immediate reaction to the energy cost crisis, but the country is also mulling new renewables. Bulgaria-based attorney, co-head of energy, at Austrian law firm Schoenherr Dimitar Kairakov says, "Bulgaria is highly dependent on natural gas from Russia... However, we see no direct impact on the plans for wind development, at least for the time being."

Polish wind is back

Wind power could replace what coal supplies in Poland's power mix by 2025, rising to 73 per cent from the 10 per cent it supplies today, finds management consulting firm McKinsey and Company.

In this vein, Poland launched its first offshore wind auctions and is on course to install its first Baltic Sea wind farms. It

also ramped up offshore efforts as part of a group of countries promising jointly to build 19.6GW in the Baltic Sea by 2030, reducing regional dependency on Russian fossil fuel. Poland's offshore wind auctions alone will target 18GW of Polish offshore wind.

Onshore, Poland already has around 8GW of wind capacity across about 50 wind farms, and this figure is growing fast. The country added 1.5GW of that last year. The nation's second biggest wind farm, the 121MW Dębsk wind farm, began operations in February.

Ramping up further this year, the country upgraded its target to 51 per cent renewable power penetration, a scenario under which it expects onshore wind capacity to rise from 8GW to 20GW by 2040.

Polish onshore wind projects have become victims of their own success.

Observing new targets in Poland, Canadian IPP Northland Power Poland's counsel Patrycja Talarek-Dabrowska said, "We see Poland as a country which is at the moment in a huge energy transition. We know that this is a coal-based country, we know it will have to change, and we have now cues for that."

Germany-headquartered consultancy Rödl & Partner, with services in energy and tax law, has assisted with regional wind M&A including ready-to-build projects in share-deal structures. Piotr Mrowiec is an associate partner and head of the renewable energy practice at the Polish branch. He says Polish onshore wind projects have become "victims of their own success."

Poland's antique and constrained networks include a swathe of 40-year-old overhead lines and refusals of network construction applications are known to cause wind project delays. The Ministry of Climate and Environment had seen a rising number of refusals for renewables seeking network connection, with up to 60-80 per cent of applications being

rejected. In March 2022, there were 405 cases of disputed grid connection refusals, mostly for solar projects.

Even so, wind developer OX2 has been riding the country's recent boom in PV projects with PV projects of its own. It has co-located PV and energy storage, for which it already operates two projects in Nordic countries, and has more hybrid projects on the radar for Poland.

OX2 finds hybrid systems using storage near PV and wind farms can get around network constraints, while allowing efficient combined use of their power. "In order to increase the opportunity to connect further renewable energy sources to the grid, investors are taking action to offer participation in the costs of modernisation of existing, and expansion of the new, networks," says OX2's Suchcicka.

The issues with grid connection and capacity are still problematic, mostly impacting the PV capacity which saw massive growth, but also new wind, says Mrowiec.

A draft law on grid interconnections should allow more renewable projects to connect directly to offtakers, avoiding the need to connect to public networks, he says. "This is actually necessary to expand the opportunities to connect new wind farms. In plain terms, there is a problem with scarce resources (around) free connection capacity," explains Mrowiec.

Smoleń says that the backlog of new projects waiting to be built could benefit from Poland's new partnership of TSOs and DSOs pledging to achieve up to 50 per cent renewable electricity by 2032. He also expects that, with wind curtailment already in Poland this year, and increasing saturation of renewables, hydrogen and storage markets could boom in Poland in the 2030s.

The European Commission in a recent country report noted that by 2032 Poland plans to invest over \$7 billion for modernising transmission networks so offshore wind power can reach industry in the south of Poland, and that the country is participating in the Baltic Harmony Link interconnection project, a high voltage cable estimated to be completed by 2028.



Rödl & Partner has seen investor clients securing the real estate for developing wind projects before trying to get network connections. "They want to be ready for the new capacities that will be there in two to five years, and not to be left behind," says Mrowiec, adding "[Investors] are massively developing new projects in Poland, hoping the new connection capacity will be there, as we think it will be. The grid operator is investing at the moment in new substations to have this improvement."

Wind in Poland is also hampered by strict rules for setbacks from housing based on wind-turbine height, the famous 10H rule, which for a time made developing wind “impossible.” March saw Poland sign into law a long-awaited revision to the rule, the Act on Investments in Wind Farms and Certain Other Acts (Also known as the “Distance Act”), that loosened the 10H rule by giving local authorities the chance to grant developers exemptions letting them move closer to housing, up to 700 metres. Poland forecasts the change will enable 6–10GW of onshore wind by 2033.

“[Investors] are massively developing new projects in Poland, hoping the new connection capacity will be there, as we think it will be.”

Piotr Mrowiec, Rödl & Partner

Mrowiec argues that, thanks to this change, now is the time to develop new wind farms. “The amendment with the liberalisation of the 10H rule is perhaps not in the scope that the majority would have wished in Poland, but it is what it is, and it is a milestone achieved after years,” says Mrowiec.

OX2 country manager Suchcicka is also optimistic about the Distance Act’s overall impact, but notes setbacks remain an obstacle, adding, “This is not enough change in relation to the possibilities and the potential offered by wind energy sector in Poland.”

Aiming to buoy popular support for wind farm development, the Distance Act also lets local citizens acquire and sell to the grid up to 10 per cent of power capacity from wind projects. However, citizens will have to pay up to €1,380 to gain 1 kW, which law firm Dentons predicted is likely to prevent citizens from participating.

Speaking at WindEurope’s conference in April, Polish Wind Energy Association Regulatory Director Piotr Czopek nevertheless noted the high level of support in polls for onshore wind. He said, “We don’t expect that it will be a problem that local communities need to agree to the onshore project.”

Poland’s first movers keep eyes on the prize

OX2 is rapidly expanding its wind development pipeline in Poland. It has five under-construction projects, four of which won support in state auctions. Two of the auction winners are set to start operations this year.

The developer already has a wind farm operating in the country. The wind farm, 21MW Żary, was sold to the asset manager for reinsurer Munich Re and a group of Munich Re insurance companies, MEAG, last year. OX2 also recently gained a permit for 14MW Grajewo wind farm, a turn-key project under development for Dutch independent fund manager DIF Capital Partners.

OX2’s Suchcicka says that international investors have a growing appetite for Polish wind. “Investors, both those who previously did not perceive Poland as a market for investments in renewable energy as well as those who knew there

were opportunities in our country, are now visibly increasing their interest in investing in renewable energy sources in the Polish market.”

Another early mover in Poland’s fast-growing wind market is Germany-headquartered developer and operator wpd, with its seven owned-and-operated wind farms in the country.

Simeon Sarafow, country manager for Poland and Bulgaria at wpd Europe, says, “In general, yes, as the market is established, liquid and shows a high demand for onshore wind projects.” He thinks the Distance Act shows authorities know that onshore wind is cheaper than offshore.

Four of wpd’s projects, for which a local subsidiary won an auction in November 2018, are located near Poznan: 42.5MW Jarocin Kozmin, 10MW Krotoszyn, 5MW Jarocin Wschod and 4.8MW Slupca. They were financed with funding from the European Investment Bank and Germany’s Landesbank Baden-Wuerttemberg.

Continuing to expand its onshore portfolio in Poland, wpd is in the process of developing one 12MW wind project this year, and its operating portfolio of includes full merchant exposure. “We have a mixture of projects with green certificates and PPAs, merchant projects and projects with successful auction participation and PPAs,” says Sarafow.

On the other hand, Sarafow explains that onshore wind investment is challenged





by Poland's country-specific electricity price cap, which caps possible revenue at an even lower level (€142.74) than the €180 cap required by the EU, prior to its discontinuation in June. "Current price cap regulation — lower prices and longer duration than proposed by the EU — is not beneficial," he says.

This may be why, from a developer's perspective, Russia's intervention in Poland's energy markets and the EU's knee-jerk reaction of a bloc-wide cap is not immediately improving wind development prospects. Sarafow says, "We see rather only indirect effects of upheavals on the European market."

Legal experts agree Poland's price cap deters fresh finance for wind, but not for long. "There is a decrease in the amount of money which is brought in via investment, but actually the price cap regulation will be temporary...We think we will have the cap until the end of this year, and then we will go back to the free market. Now, the energy prices are dropping, and this intervention is not needed anymore," says Mrowiec.

"Some of the investors looking at the Polish market are not too keen, but most are developing new projects. Inflation is a problem, as well, and you have to hedge it," Mrowiec says, adding, "From my personal perspective it would be better if we were in the Eurozone."

Piotr Nerwiński, a banking and finance partner with law firm Dentons warned in February that Poland's price caps had made wind project revenue assessments more difficult. At the same time, inflationary debt costs spurred interest in securing early construction-related equity from investors, such as IPPs.

"Some of the investors looking at the Polish market are not too keen, but most are developing new projects. Inflation is a problem, as well, and you have to hedge it."

Piotr Mrowiec, Rödl & Partner

Bulgaria friendlier to wind

Bulgaria has been through years of failed government coalitions, corruption issues and changing stances on Russia versus the EU. The current government is an anti-corruption coalition with rotating Prime Ministers formed by the party of ex-Prime Minister Boyko Borisov.

Plunged in political turmoil, Bulgaria had not been adding new wind capacity in 2021–2022. It has nationwide wind capacity of 707MW, meeting 4 per cent of power demand. Within the constraints of a large, EU-protected area for birds covering 34 per cent of its territory, Bulgaria's onshore wind may be poised for growth.

In a hopeful sign, Bulgaria was preparing to launch wind auctions once there was a coalition with a parliamentary majority, according to a May statement from WindEurope.

However, the country still has issues to work through. Grid development is a problem according to WindEurope. Local opposition is another hurdle: Last year developer Dobrotich Wind said a court had overturned a local city's attempt to put in place a moratorium on wind construction. Dobrotich Wind is a Bulgarian company of Australian renewables developer CWP Global, which plans a 592MW wind farm in Varna region that could potentially double the nation's total installed onshore wind capacity.

Bulgaria needs cheaper energy than it has in its current energy mix. Although Bulgaria became the EU's second-largest electricity exporter during last year's crisis, the European Commission has warned that it couldn't continue to run a deficit by subsidising power for its local businesses, which had cost it \$3 billion. Think-tank Ember has said more wind capacity could slash electricity prices in the region by almost a third.

The decade-long quiet spell for Bulgarian wind may be at an end: wpd in October said that after starting development in 2007, it would build two wind parks near the villages of Sokolovo and Trigortsi in the northeast of Bulgaria with a combined capacity of 96MW.

Until 2015 Bulgarian wind farms had access to tariffs. One beneficiary is the country's largest wind farm, 156MW St Nikola, which began producing power in 2010. But since 2015, Bulgaria's onshore wind market has been operating subsidy-free.

Pexapark has noted that Bulgaria's lack of subsidies leaves a significant role to be played by bilateral PPAs. The company also said Bulgaria has "relatively low renewables penetration, which makes the risk of cannibalisation minimal for now." In addition, wind power prices in Bulgaria are relatively low at around €80/MWh, less than half of typical wind power prices regionally, according to Karpital Insights.



While fully merchant commercial-scale wind and other RES projects are currently being planned and developed, the Bulgarian government is mulling introducing new incentives, confirms Bulgaria-based legal expert Kairakov.

Kairakov notes that Bulgaria's draft Energy Strategy and National Energy and Climate Plans foresee new kinds of indirect wind investment incentives that are unlike the guaranteed prices and tariffs of the past.

Under draft laws, renewable energy developers would be freed from an obligation to make payments – amounting to 5 per cent of annual revenues – to the Electricity System Security Fund. He says that under this law, there will be other ways developers can optimise project finance, for example by laying a direct network connection line to a PPA offtaker site, for example an industrial park, in order to save on fees.

“There are a lot of opportunities to be explored in this field and we are positive that this will facilitate the revival of (Bulgaria’s) wind sector,” says Kairakov.

Further, more wind will be added under a unification of the Romanian Guarantees Of Origin scheme with the European System of Energy Certificates, bringing the chance to trade GOOs on the European market, says Kairakov.

Bulgaria’s national plan for electricity grid development from 2022–2031 sets a target for 4.9GW of renewables, and within that, an onshore wind target of 343MW. But the Bulgarian Wind Energy Association in the spring called for an increase of the target to 4.5GW to take into account existing onshore investment plans and EU renewable energy targets.

“There are a lot of opportunities to be explored in this field and we are positive that this will facilitate the revival of (Bulgaria’s) wind sector.”

Dimitar Kairakov, Schoenherr

Not only are incentives back on the table, but red tape is being removed. Alexandra Doytchinova is co-head of M&A at Schoenherr. She explains the firm has historically worked on wind farm acquisitions, arranging corporate structures with a local holding company and a subsidiary-SPV for each turbine. She says,

“As licensing would be required for each legal entity that runs a capacity exceeding 5MW, such corporate structures are technically avoiding licensing of a bigger park, as the single SPVs do not reach the relevant capacity threshold for licensing. This practice is widespread, seems known to the regulator and is being tolerated.”

Early this year the capacity threshold triggering licensing for new renewable projects increased from 5MW to 20MW under a regulatory amendment, removing hurdles for new projects and investors, she says.

But the regulatory update means that certain “dormant” permitted projects that were never built from 2010 to 2012 may have permits that are expired or don’t benefit from the rules. “Thus, investors with interest in such ‘dormant’ project should be extremely cautious,” said Doytchinova.

Like in Poland, network issues in Bulgaria require attention. According to the European institute Center for the Study of Democracy, wind developers must undergo a time-consuming procedure. A lack of adequate interconnection to neighbouring countries is also critical for offshore wind, Kairakov explains, “For the time being, the costs for the interconnection infrastructure are too high [for offshore] projects to be financially viable and this is the main constraint.”

Romania readies for auctions

Credit rating agency Fitch Solutions has predicted that Romania's 2022 coal phase out law means it will decarbonise "faster" than markets such as Poland and Bulgaria, while new CfD auctions play a key role in adding renewable power capacity.

Last year Romania was gearing up to launch its first Contracts for Difference auctions, seeking expressions of interest from wind and solar developers for an auction soliciting bids that could total 950MW.

Managing partner at the Romanian arm of Rödl & Partner Bogdan Fratila explains that the first CfD scheme is set to be scheduled in the second half of this year. A final version of participant guidelines for the auction is expected in the second quarter.

This 950MW solar and wind auction has its origins in Romania's EU-led pandemic recovery scheme and it has European

Bank for Reconstruction and Development backing. The first notifications of project approval have been sent, and by the end of May, all eligible projects were expected to be contracted.

Fratila explains that, despite the current lack of wind subsidies, wind investment activity has been ticking away behind the scenes in Romania. "Occasionally we have assisted our clients in asset deals concerning land prepared for investment and alternatively securing building rights and joint ventures with public or private entities," he says. Romania has about 3GW of wind capacity, but it plans to target 5.3GW of wind and 5.1GW of solar by 2030.

It appears to have about 7GW of renewable projects in the pipeline that are likely to seek financing, for example PPAs for some existing renewable projects being refinanced, said the Netherlands' Rabobank last year.

"In the last few years, the biggest players in investment and development of wind parks were Enel Green Power, European

Energy and EDP Renewables, to name a few," says Fratila.

Italian utility Enel Group had been a leading energy player in Romania since 2005, operating in power distribution and supply. Its local wind investor and developer Enel Green Power Romania had been active in Romanian wind since 2011, but in March agreed to sell its assets in Romania including 12 wind parks to Greek power utility PPC. The agreement to sell all the Romanian operations, expected by the third quarter of this year, should have a net debt impact of €1.7 billion.

Fratila suggests that Enel Group's exit could possibly be down to grid investment obligations that were taken on when entering the Romanian market, rather than to the growth potential of the Romanian market.

He also notes that two years ago, global asset manager Macquarie Infrastructure and Real Assets acquired the biggest wind park in Romania, the generously sized 600MW Fântânele-Cogealac. The deal saw the asset manager also take on networks and a power supply business from Czech conglomerate ČEZ Group.

Fratila says Romania has renewable growth potential as it is a net energy importer. What's more, wind investment in the country stands to benefit from upcoming EU-led initiatives: Romania's answer to the RePower EU plan to divest from Russian natural gas, as well as its national pandemic recovery plan, under which €855 million will be used for ending coal production while adding renewables and hydrogen.

In addition, €550 million should be available for renewable projects under the EU's Modernisation Fund, through which the EU supports 10 lower-income member states to meet the bloc's 2030 decarbonisation targets, and 5 per cent of Romania's counties, those that produce coal, will have access to €2.14 billion from the EU's Just Transition Fund to support their transition.

Nevertheless, price caps on power sales and distribution are likely to discourage PPAs until 2025. "There is no valid free market energy price reference," Fratilla says, explaining the crippling nature of price caps.



He adds, "The general issue is rather that, at present, there are few large consumers and the distributors are very reticent to conclude PPAs.

"As such, investment income details predictions are rather volatile and access to financing is a more complicated process," he says.

Offshore hopes face wartime threat

Not even offshore wind can wholly escape the spillover from the Russia's on-going war on Ukraine. Industry observers suggest that Romanian and Bulgarian offshore development plans in the Black Sea may be delayed by threats from floating naval mines.

Naval mines have been spotted by the Romanian navy in the water and on beaches. They also hamper Romania's Black Sea fishing industry and exports of grain.

One of the Hague conventions on warfare forbids the use of unanchored automatic contact mines. However, neither Russia nor Ukraine are parties to that convention, writes Stockton Center for International Law professor Raul Pedrozo.

As one of Ukraine's Black Sea neighbours, Bulgaria has 116GW of potential offshore wind capacity. At the end of last year, two draft wind offshore laws were introduced, but they did not pass through the voting

process within Parliament, Kairakov says. In late 2022, proposers decided to withdraw the acts, and it is unknown whether they will be re-proposed.

In spite of the risks, before 2028 Bulgaria plans to install a 5MW floating wind turbine demonstrator in the Black Sea under the EU-supported Black Sea Floating Offshore Wind (BLOW) project scheme.

Offshore ambition is also evident in proposals for joint projects between Bulgaria and Romania. Late last year, newly formed developer Hooracán Energy proposed to build up to 3GW of offshore wind in the Bulgarian part of the Black Sea by sharing interconnection costs with Romania.

Last September American infrastruc-

Offshore ambition is also evident in proposals for joint projects between Bulgaria and Romania.

ture investor Global Infrastructure Partners acquired and gave a new name (Skyborn Renewables) to wpd's global offshore development pipeline of over 30GW, including offshore projects in

Bulgaria and Romania. Through this unit, wpd had planned a 1.9GW offshore wind farm in Romania as well as a project off the Bulgarian coastal town of Balchik, emphasising that the ramp up of offshore in the two countries is linked.

Romania is also preparing for a leap forward in the offshore wind sector, but as in Bulgaria, not very fast, and it is unknown whether prospects could be delayed by war. Romania is estimated to have 76GW of offshore wind potential, of which 22GW is fixed and 54GW is floating.

Romania signed a pledge alongside G8 countries, including the US and Japan, to ramp up offshore wind at the COP27 climate conference last year, via the so-called Offshore Wind Alliance.

Under the Danish-led initiative, Romania is required to set national offshore wind targets and strategies and execute them through its Paris Agreement-related plans. The venture's call-to-action document would see the publishing of its offshore commitment, explains Fratilla. Time will tell whether these lofty offshore wind plans are followed through.

While both offshore and onshore growth in these countries faces a multitude of challenges due to energy price rises and political instability, a green light for the first auctions in the Black Sea would be seen as the latest promising sign for the energy transition in a region the world has its eyes on. ■



Allianz Capital Partners' Stefan Henge



Longer-term PPAs look like an enduring trend, one playing an important role for long-term capital markets, says Allianz Capital Partners head of renewables, Europe, Stefan Henge. Henge looks optimistically on demand in a European PPA market that has seen some price volatility. He eventually expects to see more price cannibalisation.

Allianz Capital Partners became an owner and developer of renewables in 2005, attracted by the assets' high cash flow visibility boosted by, at the time, regulated long-term Feed-in Tariffs. On the back of this, Allianz invested in a 3.5GW offshore, onshore and solar generation portfolio in Europe, with 150 assets comprising both sole ownership and joint venture models. This complements its cash equity investments in the US.

FQ: What factors are impacting Allianz's wind PPA activity in Europe and the US?

SH: For new investments, finding a suitable long-term PPA with an appropriate risk allocation is key to our investment decision and allows us to further grow and diversify our renewables portfolio. On the back of an accelerating build-out speed of renewables and increasing project sizes, there will be an increased demand for all types of PPAs. One will see how far the PPA market can grow with the renewables build-out and how this will impact pricing and risk allocation structures.

“One will see how far the PPA market can grow with the renewables build-out and how this will impact pricing and risk allocation structures.”

FQ: Looking at the past year, have you seen any notable trends in PPAs for wind?

SH: For new investments and projects, we can see the clear trend of more large-scale corporate players emerging who are seeing PPAs as a crucial means to achieving their stated decarbonisation goals. In addition to the role as pure PPA offtaker, industrial players are becoming interested in obtaining a direct equity position in the respective assets for further alignment of interest.

One further notable trend we observe is the increasing availability of PPAs beyond the standard 10-year tenor. The depths of the PPA market for tenors of 15 years or even longer seem to be increasing again. For an investor like Allianz having a desire for long-term and stable cash flow profiles, this is an important and positive development.

FQ: With today's higher-power-price environment and PPA revenue structures, is price cannibalisation still a concern for projects?

SH: With the further accelerating build-out speed of renewable generation capacity, we expect this to become an even more pronounced effect in the future, displayed in the generators' revenue pattern. This affects not only actual revenues received in a merchant sales situation, but equally PPA pricing must consider the specific local demand or supply and expected build-out situation to manage price risk over the PPA term accordingly.

To counterbalance the impact of price cannibalisation, energy storage solu-

“The depths of the PPA market for tenors of 15 years or even longer seem to be increasing again.”

tions as well as the emergence of price responsive demand-side flexibility, including EVs and electrolysis would have to play an important role, but the speed and extent of deployment remain uncertain. The race between renewable energy deployment and demand-side flexibility will shape power market expectations for the foreseeable future, and consequently drive PPA pricing and merchant revenues.

FQ: How much are you relying on available power price forecasts within your PPA contracting process given the volatility, and has that changed?

SH: Investing in renewables as an asset class requires a good understanding of short- and long-term energy market dynamics and the resulting long-term power prices driving the value of renewable generation assets beyond any contracted or fixed-price revenue period. Within the context of the PPA contracting process, power price forecasts do serve as a certain reference and benchmarking point, especially when the PPA contracting period only starts in a few years' time. However, ultimately the nominal price level of a long-term PPA is more a question of supply and demand as well

as individual requirements by the parties linked to a specific project situation or location, and hence is to a lesser extent influenced by short-term market price volatility. For PPAs with a short tenor, we see market forward curves as a good and relevant benchmark allowing to steer the discussion with potential offtakers. Here long-term power price forecasts are less relevant, especially in the more recent volatile market environment.

Speaking as an investor with some degree of flexibility on the amount and tenor of PPAs, PPAs need to be competitive compared to our power price expectation after taking into account the decrease in risk and cost of capital.

FQ: What is the best approach for the conversation with off-takers when both sides are navigating power price uncertainty?

SH: As an insurance company and a long-term investor, we are interested in long, stable and predictable cash flow patterns from renewables as an asset class. As such, we are looking for off-takers who are able to provide us with long-term price visibility and certainty and manage associated price risks of a PPA as suitable for the individual asset situation. Understanding PPA structures, price components and respective price risks is therefore fundamental to approaching discussions with potential off-takers. The same goes with transparently setting out expectations on risk allocation when starting to explore mutual interest in a long-term cooperation on the PPA side. ■



Quarterly wind disputes

In Q2 the offshore wind market has continued to grow, with most developments taking place in the bottom-fixed space in Europe. However, the floating offshore wind sector is seeing progress, with several auctions and tenders planned for later in the year (including in the UK, Spain and Portugal) and France pressing ahead with tenders off the coasts of Brittany and Marseille.

As is often the case in a hot market, disputes have arisen at early stages during the floating wind tender process. An example can be seen in the recent Scottish Court decision in *Moray Offshore Renewable Power Limited v Bluefloat Energy UK Holdings Limited*, a dispute between two developers. Moray Offshore claimed £400 million in damages on the basis that it alleged Bluefloat had exaggerated its experience in the industry in order to win the tender process. While the court dismissed the claim in part on issues of causation (because Moray Offshore could not prove it would have won the bidding process had Bluefloat not made the alleged misrepresentations), it is an interesting indicator of the kinds of disputes which can arise in this type of market.

While an element of growing standardisation in bottom-fixed wind means that stakeholders are getting more comfortable with the technology and installation requirements, the market has continued to see disputes globally around defects, delays and disruption, seabed and weather conditions, and disputed variations as more projects get in the water. As more turbines are installed, the danger of serial defects, and the knock-on effects of issues in a scaled-up supply chain, continues to grow. While there may be pressure from those entities at the top of the contractual nexus to simply get on with things, the importance of keeping a clear eye on the contractual requirements cannot be over emphasised. If, for example, there are notice requirements for any potential claims, a party is unlikely to get any sympathy from an arbitration tribunal or court if these were not followed, irrespective of what may have been said at the time.

In Q2, the industry has continued to look at developing standard supply and construction contracts, as occurred in the oil and gas sector in the 1990s with the LOGIC contract forms. This was an initiative that was specifically discussed during a presentation by IMCA at the recent Global Offshore Wind conference in London in June 2023. The initiative would include developing bespoke dispute management mechanisms suited to offshore wind projects. Indeed, there

is a discernible trend, in the often-conservative offshore wind industry, to look carefully at such mechanisms with a view to providing a viable (and less costly) means of resolving disputes without recourse to arbitration or court proceedings. Use of dispute boards, for example, is specifically designed to assist parties in avoiding formal disputes, but if they do occur, it is possible for the parties to agree that the boards have the power to issue a binding decision. Similarly,



expert [EDITORIAL-USE-ONLY]-shutterstock_677787295 determination or recommendation can provide a quick and independent view on disputes, particularly on a technical issue, which then allows the parties the opportunity to attempt to reach an amicable agreement. In this respect, WFO maintains a list of experts with relevant competencies, which provides parties with a useful resource, and its dispute resolution committee has produced a standard expert determination clause which can be incorporated into offshore wind contracts.

Within the market, there have also been developments in certain longstanding offshore wind related disputes, albeit not strictly related to supply and construction contracts. For example, Orsted and BP have recently settled their disagreement regarding an overlapping area of seabed between Orsted's Hornsea 4 development and BP's Endurance carbon capture project – a result which means that the Hornsea 4 development can now proceed. Similarly, the long-running Siemens Gamesa and GE patent dispute regarding wind turbine design was settled on a confidential basis in both the US and Europe in April. The industry had been following this dispute with interest,

not least because different conclusions were reached on patent infringement in the US and UK courts. Agreeing worldwide cross-licences for the relevant patent families allows both parties to move forward without having to navigate complex and inconsistent patent positions in different jurisdictions.

There is currently great pressure on the industry to meet the targets laid down by governments around the world, and there is much concern about the need for the global supply chain to grow substantially in a very short time. While disputes are inevitable, having contractual mechanisms in place that provide an opportunity for their early resolution has the potential to minimise delays and reduce costs; that in turn can help mitigate the consequences of disputes and ensure that relationships and margins remain unaffected. We expect to see a continued dialogue in this area amongst the stakeholders over the course of the year ahead. ■

— ANDREAS DRACOULIS,
JONATHAN MORTON AND
LEO GRUTTERS (JUNE 29, 2023)



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DEVELOPER Q&A:

Corio CEO Jonathan Cole

April marked the one-year anniversary month of the launch of Corio Generation, the offshore wind developer spun off from Macquarie-owned investor Green Investment Group and recently nominated for Offshore Developer of the Year at the Wind Investment Awards.

Corio picked up GIG's global pipeline of under-development offshore wind projects, access to long-term capital internally as well as from third parties, and an existing relationship with TotalEnergies' renewable energy business in the UK and South Korea, among other markets.

The partnership sees the pair working together as offshore developers and investors in places like Europe and Asia-Pacific. CEO Jonathan Cole explains these developments.

FQ: Corio is blazing a trail with its model for offshore wind institutional investment. How is this reflected in the deal shortlisted for Offshore Equity Deal of the Year?

JC: That was to do with a partnership with Ontario Teachers' Pension Plan. It's an arrangement where we have brought them in as equity partners on an asset-by-asset level across 15 different offshore wind projects in our global development portfolio. What is interesting about this particular deal is that it is bringing in an institutional investor to offshore wind projects at a very early stage in the lifecycle to seed the development portfolio, not necessarily with any predetermined cash flow from returns.

This is just to seed the development portfolio, which is quite important for offshore wind. For a big offshore wind portfolio, you need to put a lot of capital down over a very long period of time, much of which you don't have any certainty on returns. These types of equity financing deals will be very important. If we can add the 2,000 GW of offshore wind that the world is trying to build over the next 25 years, we are going to need more and more participation of this kind in the development of offshore wind, because it

costs more money to do it than it would for onshore wind.

Corio has a global portfolio of projects in Europe, across the APAC region, South America, and probably quite soon in North America. This deal with Ontario Teachers' is picking out some of the 15 projects across those regions. It's quite diversified.

I think the Ontario Teachers' deal shows a new way of bringing financing into a development portfolio. It has never been done before in offshore wind and it shows that we are willing to be innovative. So we will keep that train going, but at the moment we're not at the stage where there's any transaction imminent because we're still developing the portfolio and at least a year away from the first financial close.

FQ: Corio works with TotalEnergies as an equity partner in the UK and South Korea. What kinds of additional partners is Corio interested in talking to?

JC: The interesting thing about Corio is we are open to working with any type of partner. So it could be an industrial partner like TotalEnergies or it could be a financial partner. What we've done with Corio is we've created best-in-class in-house expertise to develop and deliver offshore wind projects.

TotalEnergies is probably the most relevant partner that we have right now in the UK and South Korea. We're also going to be partnering with TotalEnergies in Taiwan, so that's another interesting development in the partnership. No doubt, we will find other markets where it would make sense for us to be partners there.



Beyond that, we're open to working with other industrial players, or financial players to work with local developers. In fact, we do that in places like Vietnam, Korea and Brazil, where we are working with local developers, combining our global capability and their local knowledge. We can work with any partner and we will work with a whole range of partners to develop this vast portfolio. We launched with 15GW and we now have over 30GW of projects that we're working on, so we're growing fast.

Our model is to have the capability to actively manage any offshore wind project in any market at any stage in the lifecycle, so we will have the full breadth of capability. We're already on the way with 250 people. We'll be up over 350, probably this time next year.

The model that we think makes sense is that we develop projects and then we recycle the capital as we go, and we will bring in the right type of investors at the right time. So probably, over time, the ownership of projects changes, but Corio will always have a presence. We will always be there actively playing our role in managing the projects.

At the moment, all of the projects in our portfolio have the equity participants in them that we need for this stage of the project, and it's probably only at a later stage of the project, when it has been fully de-risked and it is about to be built or has been built, that we may consider bringing in another type of equity participant in order to make the capital as efficient as possible.

FQ: Have any of Corio's offshore wind projects in Europe reached financing and construction stage, and if so, which ones?

JC: The three most advanced projects we're working on in Europe are in Ireland and in the UK, Scotland and in England. In total, it is about 4GW of projects.

In Ireland, the (450MW) Sceirde Rocks project has qualified for the first Irish auction process, which is taking place in a few months' time. We will be bidding into that process with the Sceirde Rocks project, and if that one is successful in that auction, then it will be our first financial closing project in Europe.

Beyond that, we have two huge projects in the UK, in Wales, England (1.5GW Outer Dowsing) and Orkney, Scotland (2GW West of Orkney).

West of Orkney has the lease that was secured under the Scottish Crown Estate leasing process. What we're now doing, having spent a couple of years doing the environmental impact assessment work and planning, is submitting the permitting applications to the authorities in England and Scotland for each of those projects later this year.

FQ: What is Corio's vision for PPA offtake arrangements on offshore wind projects?

We are capable of participating in any type of market, any type of offtake arrangement. With our heritage in GIG, we have experience of actually dealing with private offtake arrangements, as well as bidding into winning public tariffs, so it will really depend on the market.

In the UK, of course, we will look into CfD processes. In Ireland, we're putting into the public auction under the Renewable Electricity Support Scheme (ORESS) process. For other markets, though, we may be looking into private offtake or long-term private PPAs. We are already in the process of looking at that in certain markets, particularly places like Taiwan.

FQ: Is Corio in financing talks for any newly developed wind projects, and if so, at what stage are the talks?

JC: The project that's closest to financial close for us is Formosa 3 in Taiwan. It is a project that we were awarded at the end of last year in the Taiwanese auction process. That was Corio's first time to ac-

tually participate in a competitive process against our peers so it was great to be successful, and arguably be the most successful, because we were awarded the highest capacity.

We are already, of course, engaging the market, preparing ourselves for that process in the run up to financial close in the first half of next year.

The project that's closest to financial close for us is Formosa 3 in Taiwan.

FQ: How is Corio's offshore revenue strategy different for emerging markets in Taiwan, Australia and South Korea than it is for say, the UK?

JC: The way this works is that the approach is tailored to the conditions of the market. We have a process. So in the UK, it's a very mature market, a relatively high cost of entry but then a relatively stable process that you go through from



permit to grid connect, to build and sell the power via a CfD auction. That's the kind of process that we participate in, because we like the stability of that process.

In other new markets like Taiwan, it's a bit different, because you are not only having to develop the project, but you are also having to find your own route to market. The good thing about Taiwan is there is quite a heavy industrial offtake requirement there, and there is plenty of liquidity in the market. The revenue strategy will be tailored to suit the maturity of the market, whatever the conditions are.

FQ: What roles do TotalEnergies and Corio play in the partnership and is TotalEnergies an offtaker?

JC: The arrangement with TotalEnergies is that we will deliver the projects together, both participating with resources and expertise in the delivery of the project. Then the offtake arrangements will be sold by the project using our combined strategy for selling the power. It's to be determined project-by-project at the right time and optimised for each project. So at this stage, nothing has been finalised for any of the projects we're working on with TotalEnergies.

I wouldn't categorise Corio as being oriented with only project development or financing. We are an organisation that has within our team all the right engineering, construction and operational capability. We have recruited around about 150 people in the past year with that flavour. We've got some pretty experienced people who have been there and done it before.

We are already a full-life participant in offshore wind projects, and so are TotalEnergies. Each time we do a project together, we come in as a partnership of equals and we contribute together in the delivery of the project, with each of us being capable of participating in any aspect of the project.

FQ: What is the status of floating wind development and bankability?

JC: I think what will come and what will make it a competitive part of the mix is



the scalability of floating. Where the industry wants to go next is to start doing these projects at commercial scale.

The issue of the era is that, at scale, floating becomes not so much a game of structural engineering but a game of logistics, because it requires massive port capability and heavy engineering capability quite close to the project.

“South Korea is probably the only place right now where you have a good regulatory framework with very good licensing for floating wind.”

That is why in our portfolio we are moving the fastest on floating in South Korea. South Korea is probably the only place right now where you have a good regulatory framework with very good licensing for floating wind, and also you have the port infrastructure and the heavy engineering capability, all there and ready to go.

In Europe, we are still several hundreds of millions of euros of investment away from having the port infrastructure ready for the floating sector to be deployed, and that is probably why floating in Europe is going to take a few more years than in places like South Korea.

I think potentially by the end of this decade, there will be a floating wind project financed, but it will be somewhere like South Korea, because it has the ports and the heavy engineering capability, as well as floating projects and regulatory goals.

FQ: In terms of the first floating-inclusive auctions expected in Norway this year, and held in the UK and France in last year, what's the timeline for the development there versus Korea?

JC: Those projects will also be developed and be prepared to be built towards the back end of this decade or early into the next. But I think the issue is in South Korea, you could probably see offshore floating projects at commercial scale being put in the water as early as 2027-28, and that's going to be a couple of years ahead of the European markets. ■

SkySpecs CEO Danny Ellis

American asset inspections company SkySpecs started out offering automated drone inspections, but has gradually evolved to offer more services related to financial asset management, as well as calculating the ROI of replacing and stocking components. It is providing due diligence inspections amid the recent increase in M&A activity, explains CEO and Founder Danny Ellis.



FQ: How do you see the M&A markets evolving in the US and Europe?

DE: In Europe, you'll see a large private equity firm come in and own a fifth of a farm or a portfolio. You see this with London Array, which is owned by multiple financial institutions and has been since the beginning. After the Inflation Reduction Act's expansion of tax credits in the US, there has definitely been increased movement on selling older wind farms so developers can move on to new development. There's also increased appetite among some developers or some owners to go after older assets and either flip them or reinforce them so those wind farms will last longer, whether that's repowering them, or just operating them differently to try to extend the life of those assets.

FQ: How do you see M&A markets changing in the US these days?

DE: The IRA in the US gives tax credits for the first ten years out of a 25 to 30-year lifespan. That is fairly early to sell a wind farm. As for developers, I would say that we were seeing a couple of different things happen in M&A. One, back to the supply chain challenges, the larger entities can weather those challenges better than smaller ones if they are not propped up by other forms of income. What I mean by that is if it's a utility that has different forms of generation, they can weather that. But the small entities are becoming co-owned by multiple financial institutions.

As the industry matures, and if you look at forecasts of how fast it's going to scale up over the next ten years, I think it's only natural for the larger entities to consol-

idate the older ones. They might be at the end of warranty, or they might be at the end of a longer service contract. It might just be because the supply chain has stretched their ability to operate, and they're looking for a way out. As I said, developers may want to move onto new developments and free up cash. We see a little bit of all of it.

FQ: What are the trends in demand for SkySpecs' services and products, especially when it comes to financial management of assets?

DE: We're seeing significantly increased demand for more data, better data, different types of data and more frequent analysis. What used to be done every five years is done twice a year now, and that is really building up better damage databases for each company. Particularly in Europe, where your Euro per kWh fluctuates so much when the wind blows or

power price volatility or price caps will change how much you make. You don't necessarily have great predictions for that, so then unless you have data, you don't exactly know where to put money into maintenance. It all has to be tied together.

FQ: How has inflation changed the way customers choose to use the data on component failures that you're providing?

DE: People are just scheduling repair technicians sooner and getting them out there sooner, before they may even know exactly what's broken. They are also doing several things in parallel, whether that is hiring the repair crew or getting them out there and having SkySpecs do an initial inspection. If you wait too long and then you call the repair company, they're already scheduled somewhere else. Repairs are a very limited resource right now. It's a global thing. ■





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