

Bird & Bird

# Corporate PPAs

*An international  
perspective*

2024



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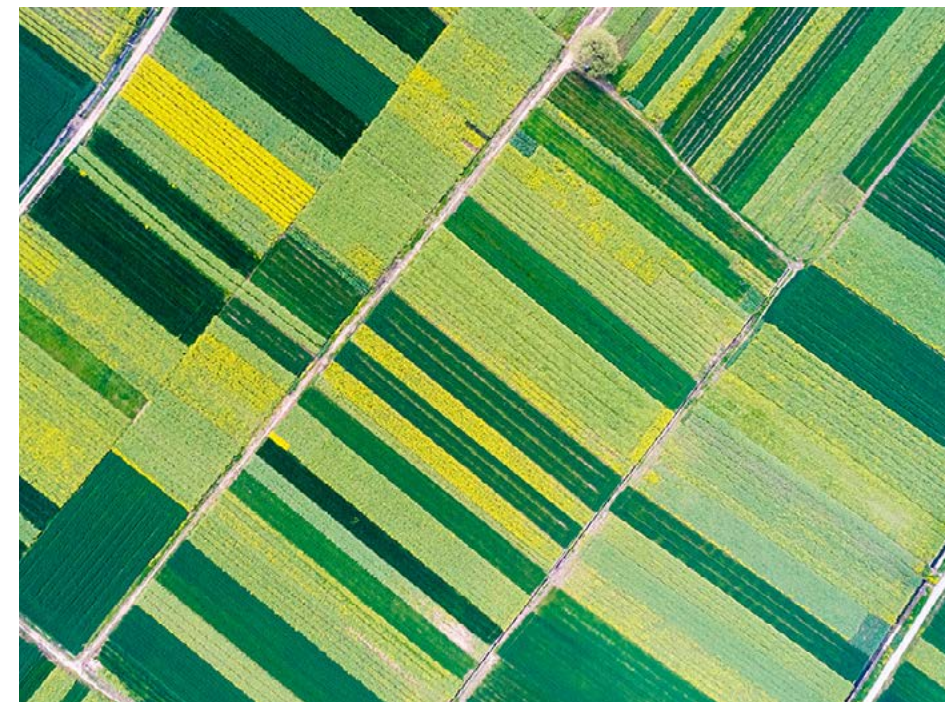
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# Introduction

2023 marked a strong year for Corporate Power Purchase Agreements (PPAs), with an impressive 46 GW of clean power deals being contracted through Corporate PPAs. Germany, Spain, France, the UK, Australia and the US were listed as the [most attractive jurisdictions](#) for Corporate PPAs, showing a global commitment to sustainable energy.

## An Overview: The Corporate PPA Landscape in 2023

While the US maintained its position as the largest market for Corporate PPAs in 2023, accounting for 37% of the deals announced in 2023 (which dominated the 45% in the wider Americas region). However it was Europe that achieved the highest growth of any region; the volume of Corporate PPAs in Europe grew [74% between 2022 and 2023](#).

This surge in Europe was driven by a combination of state-sponsored financial incentives in Europe, such as the French government's credit guarantee scheme, and increasing regulatory pressure on corporations to meet their stated net-zero ambitions. These two factors alone drove Corporate PPA appetite in the region and significantly expanded the pool of offtakers entering the [Corporate PPA market](#).

Following an incredibly strong 2023, it is evident that Corporate PPAs will continue their upward trajectory, albeit at a slightly less meteoric pace.

## The European PPA Market in 2024

Spain continues to lead the charge in Q1 2024 with a total of 26 public signed PPAs, followed closely by 17 in Great Britain and 12 in Germany (it should be noted that the mechanisms used for counting PPAs varies from source-to-source depending on from where they derive their data and how they assign a PPA to a [certain time period](#)). However, substantial demand from Germany's industrial sector, alongside incoming regulatory changes to put government-backed subsidy schemes in place, means that Germany may soon overtake Spain as the continent's largest Corporate PPA market in 2024. Similarly, though France is a relatively new entrant in the Corporate PPA market, its new government support scheme, which supports Corporate PPAs through bank guarantees issued by Bpifrance, may push it into a top three European market in 2024.

Venturing into 2024, Europe continues to show its unwavering commitment to a cleaner, greener future. In the first quarter, 73 PPA deals were

signed in Europe, with a total capacity of 5.4 GW as compared to the 41 deals recorded over this [same period in 2023](#).

## Leading the Charge: How we can help your business

Having advised on some of the earliest Corporate PPAs in the Netherlands (2007) and the UK (2009), we have become an experienced advisor on these structures globally. Our longstanding experience navigating the Corporate PPA landscape means that there's not much we haven't seen when it comes to advising on these evolving, and often complex, structures. This report looks at the main drivers propelling the growth of Corporate PPAs globally. It addresses several innovative deal structures and provides an overview of market considerations in key jurisdictions across Western and Eastern Europe, the Nordics, Asia-Pac and the USA.

# An overview of the EMEA Corporate PPA Market



## What is a Corporate PPA?

A Corporate PPA allows corporate energy consumers to purchase power directly, and on a long-term basis, from renewable energy generators, even if they are not located nearby. They provide an alternative to the traditional model, where businesses purchase power from utilities that gather energy from multiple generators. Corporate PPAs are long term agreements, typically between 10–20 years, that provide price certainty for both the corporate and the generator by using fixed or floor pricing structures. We elaborated on this in page 10 of this report.

## The Global Market: 2023/24 at a glance

In 2023, Corporate PPAs were tied to 25% of solar and wind capacity additions globally (outside of mainland China) [compared to 5% in 2015](#). The US continues to be the largest single Corporate PPA market but Europe's market share is growing. Solar continues to be the most popular renewable technology for Corporate PPAs and accounted for half of deals in Q1 2024.

However, wind (particularly offshore) continues to gain popularity in Europe and contributed to 30% of deals in Q1 2024 for a total of 1.7 GW contracted.

Globally, the corporate PPA market has grown 33% on average since 2015 and its growth is expected to continue in 2024, albeit at a slightly slower pace than in the [previous two years](#).

Following a distinctly sellers' market, some commentators are predicting that buyers are expected to regain the upper hand in 2024; supported by the lowering of [solar equipment costs](#). Corporate PPA prices across Europe have mirrored the stable reduction in both gas and power futures pricing which has increased buyers' confidence in taking [long-term price risk](#). However, in some countries, buyer demand for corporate PPAs may continue to exceed the availability of green generation. This is due to a range of factors including continued delays in new generation coming on-line (e.g. grid connection delays), a continued pivot by generators to Government backed revenue streams (e.g. contract for differences) and

regulatory constraints such as the ring-fencing of UK REGOs from the rest of Europe and European GoOs not being available in the UKE market which has pushed up buyer demand in the UK for UK REGOs and, consequently, corporate PPAs.

## Market Overview: EMEA

Europe – the fastest growing PPA market in 2023 – continues to be buoyed by an easing of supply chain difficulties and a normalising of gas prices following the 2022 energy crisis. Additionally, regulatory pressures, in the form of windfall taxes and revenue caps, eased in 2023 and were replaced with favourable regulatory conditions. The EU's defining of the requirements for green hydrogen PPAs brought clarity and certainty to the market, as did Brussels' decision to opt for soft reform of the electricity market design rather than a [complete overhaul](#).

Supply-demand balances are different between European jurisdictions as a result of differences in renewables build out and demand growth. Among the three largest Corporate PPA markets in Europe (Germany, Great Britain and Spain), Germany is undersupplied whereas Spain is [oversupplied](#).

Uptake of Corporate PPAs in Sub-Saharan Africa continues to be limited but there are definite signs of market growth. For instance, Zimbabwe has developed a pilot programme designed to develop a suite of standardised documentation (including a Corporate PPA) to be used by independent power producers [in the country](#).

The pilot programme is culminating in a bankable 25-year Corporate PPA with Vungu Solar, which the Zimbabwean government hopes will drive private sector investment in the country's renewable energy sector.

In some countries the regulatory framework does not yet fully allow for commercial Corporate PPA structures (e.g. because the market operates primarily on a single buyer model). Notwithstanding this, regulators and the private sector continue to find ways in which to more readily (contractually) connect green energy generation with end consumers. Examples include Egypt's private-to-private agreement model and innovative commercial / contractual arrangements in Nigeria.

# An overview of the APAC and US Corporate PPA Market

## Market Overview: APAC and US

Corporate PPAs for renewables in APAC only make up 15% of the global Corporate PPA market with Australia and India accounting for 80% of announcements. However, with contracted capacity expected to be up 35% year-on-year, there is still plenty of [room for growth](#). Policies such as Malaysia's Corporate Green Power Programme and South Korea's Third Party PPA scheme will be key drivers for market growth. Solar continues to be the most popular renewable energy technology in the region accounting for more than half of contracted Corporate PPAs in the first half of 2023.

The US remains the largest market for Corporate PPAs in 2023 with 17.3 GW of deals announced, though this was down by 16% from 2022 levels. US PPA prices increased 4% in the first half of 2023 as a result of high interest rates and expensive equipment contracts signed in years with supply chain bottlenecks. While the US is both the largest and most mature Corporate PPA market according to EY's Renewable Energy Country Attractiveness Index, it is ranked 5th for attractiveness owing to its poor 'future market

score' which predicts a slower relative rate of growth in comparison to more dynamic markets in Europe and APAC.

## Who are the key drivers of growth?

The main participants in these deals are tech companies and data centre owners. Amazon remains the largest corporate clean energy buyer in the world, having announced 8.8 GW of PPAs across 16 countries, including 5.6 GW of [solar PPAs](#). The second largest buyer of Corporate PPAs was Meta which announced 3.1 GW of PPAs in 2023 (all of which were solar).

There was a surge in mineral extraction sector PPAs in 2023 which can largely be attributed to the acquisition of 4GW of PPAs by Rio Tinto in Australia – one of which was Australia's largest renewable power [deal to date](#).

The liberalisation of power markets in mainland China and Taiwan has led to some new entrants on the global market. For instance, the Taiwan Semiconductor Manufacturing Company (TSMC) recently agreed several large offshore wind deals slated to commence operations in 2026. Meanwhile, in mainland China, Linde signed a 320 GWh solar Corporate PPA in Q1 2024.

On the seller side, Engie topped the Corporate PPA leaderboard for the first time since 2019 as it sold 2.4 GW of clean energy to corporates in 2023. Engie was also the only major developer to sign a solar, onshore and offshore wind Corporate PPA in 2023. The rise of corporate PPAs has had a knock-on effect on solar corporate funding which hit a decade-long [high in 2023](#). Solar companies raised \$34.3 billion in corporate funding in 2023 alone.

The electrification of transport and AI's large (and growing) energy demand continue to drive growth in private sector power needs.

## Paving the way towards Clean Energy: The RE100 Movement

The RE100 is a global corporate initiative uniting over 420 major businesses, all dedicated to achieving 100% renewable electricity. With an ever-growing membership, these companies are making significant strides in green energy consumption. It is estimated that companies with 100% clean energy targets under RE100 still need an additional 105 GW of solar and wind by 2030 (as at [summer 2024](#)).



In 2022, Qair Polska decided to start repositioning its business strategy from pure-IPP approach into energy company based on full-service approach including renewable generation assets and sleeving/balancing services from own trading company. Owning both wind and PV assets Qair Polska is well positioned to offer tailored solutions to cover individual needs of particular large consumers of electricity. Up to date, Qair Polska executed several large cPPAs with 10-15 year tenors covering a mix of wind and PV technologies.

The off-takers are large corporates with investment-grade or undisputed leaders of their industries (interior design, FMCG, sporting goods, air transport). Various cPPA concepts were approved and project-financed by several institutions. Qair Polska S.A., places great emphasis on aspects such as reliability, knowledge and communication when selecting a business partner. Bird & Bird can be considered among the leading legal advisors in the area covered by the cooperation.

# Opportunities and threats

## Corporate Consumer

### Opportunities

- Fix/floor/cap power price – safeguard against rising or fluctuating energy prices in the wholesale markets.
- Achieving sustainability targets and objective to buy 100% of power demand from renewable sources. This is fast becoming more important than economic drivers.
- Smaller corporates can join together to share risk and enhance bargaining power.
- Blockchain PPAs will make it easier to aggregate demand with other corporates and enter the market.
- New technology emerging to enable 24/7 purchase of renewable power.
- Growing number of standardised PPA commercial / contractual models which provides more tailored and scalable solutions. This includes corporate consumers increasingly preparing their own template PPAs.

### Threats

- Board appetite for the deal – economic benefits only add up if the board trusts the power price forecasts. Board is often unwilling to pay more in short-term for lower prices in long term. This is a particular risk this year, given current extremely high year-ahead pricing.
- Complexity/costs in negotiating the contracts. Power purchase is not core business. This will pose a hurdle for small and medium sized enterprises.
- A utility will still be required to provide power when the generating station is not generating (renewable power is intermittent). Allocation of volume and shaping risk is a key issue – it can affect the level of price certainty that is achieved and means the corporate is buying power at a profile/volume that doesn't match its demand.
- If a project finance lender has financed a project, it may require further security from the corporate: e.g. direct agreement or parent company guarantees.
- Change in law risks affecting the commercial balance of the deal and triggering renegotiation.
- Demand for Corporate PPAs continuing to outpace green energy generation.
- Lack of contractual standardisation.
- Potential for protracted negotiations (with some regional and country surveys noting that negotiation times are reducing but that it can still take 12-24 months to conclude a PPA deal).

## Generators

### Opportunities

- Generators can achieve a stable price over the long-term as the corporate often has more appetite to hedge against rising/fluctuating power prices. This is particularly attractive for projects financed by investment funds and project finance.
- The corporate is sometimes willing to pay higher than wholesale prices in the short term, with the expectation that this will pay off in the long-term when prices rise and the corporate still has the benefit of the fixed price.
- The phasing out of renewable subsidies means that Corporate PPAs offer a new route to market for generators.
- Blockchain PPAs are an easier route to match generation with corporate demand and to access higher tariffs.

### Threats

- Price – the price the corporate is willing to pay may not be sufficient to bank the project.
- Creditworthiness/bankability of offtaker – a bigger issue for unsubsidised projects as the Corporate PPA will represent almost 100% of total project revenues.
- Power offtake not core business for the corporate: if wholesale power prices decline will the corporate default in order to buy their way out of a bad bargain?
- Inconsistencies between regulatory regimes in different member states making it difficult to achieve scale across jurisdictions with one offtaker.
- The deal will need to be bankable. More complex to get a Corporate PPA approved by banks/investors?
- Optimisation and energy storage.





CEMEX is pursuing a broad and demanding sustainability agenda specifically including the reduction of CO2 emissions to ultimately become a ‘net zero’ company by 2050. In order to achieve this, we have defined a very specific roadmap for the implementation of individual decarbonisation targets. In doing so, we are also working with external partners such as the law firm Bird & Bird, who, as leaders in their fields, can support our progress towards these ambitious goals. Thanks to the unique experience, commitment and know-how of the Bird & Bird team in developing our Corporate PPA with Statkraft Markets GmbH, we were able to take another important step on this challenging path.

Włodzimierz Chołuj Member of the Management Board of Cemex Polska



# Corporate PPA Contract Structures

## Private wire

The simplest of the PPA structures, this involves a contract being made between an offtaker and generator who are co-located or located in very close proximity which means that electricity can be transported and delivered without a third-party utility or grid connection.

Such deals are often exclusive and the grid bypass further reduces licencing and grid costs. However, such savings must be weighed against the prices of maintenance and repair which will be heavily negotiated.

## Sleeved

Also known as a physical PPA, these further fit into two main subcategories, pay-as-produced and pay-as-nominated (also known as a baseline PPA). A sleeved PPA involves an offtaker signing a PPA with an electricity generator in parallel with a separate agreement with a licenced intermediary who transports the energy from the generation site to the offtaker's site and tops-up if needed.

Pay-as-produced is, as the name suggests, an agreement whereby the offtaker pays for the amount of energy generated and delivered. This aligns to the natural output fluctuations of a renewable-generation project whilst also mitigating underproduction risks. Pay-as-nominated involves paying for a fixed amount of energy regardless of overproduction.

This can lead to higher risks in the case of underproduction for renewable producers but can be amended via 'fixed-shape' structures which account for predictable variation in renewable output (e.g. dropping expected solar output to zero during dark-hours). A potential key benefit of such a structure is to enable the offtaker to receive renewable electricity with greater certainty on price (recognising that for some PPAs the pricing can link to market prices).

## Synthetic

Also known as a virtual or financial PPA, this structure does not require the physical delivery of power. Instead, the generator sells power to a utility company in a conventional utility PPA who then supplies electricity to the end-user. However, the end-user may make a separate

agreement with the generator for a contract for difference (or alternative derivative) under which the parties agree to settle the difference between market price and an agreed 'strike price'. This is often accompanied by the purchase of GoOs where companies want to offset their emissions.

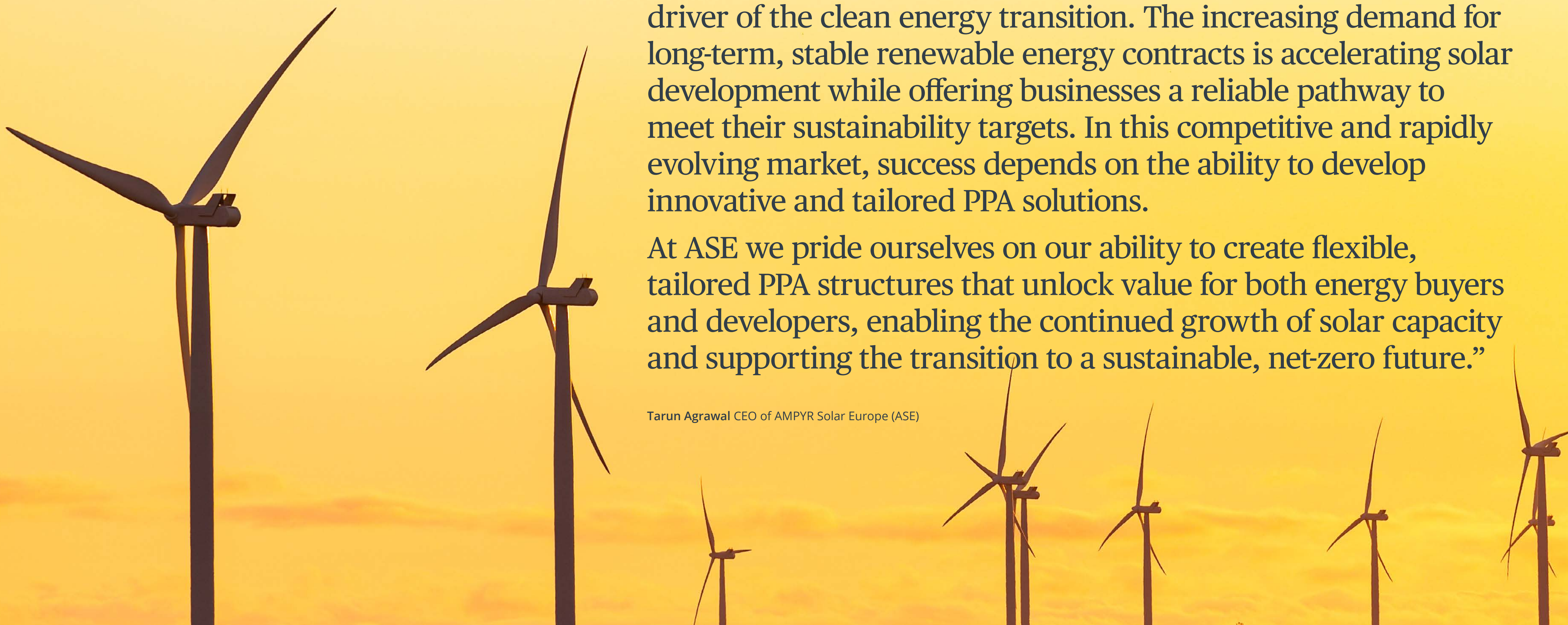
Such a structure is also utilised for cross-border PPAs. However, the derivative contract could be considered a regulated financial instrument and so further regulatory advice and subsequent authorisations and compliance may be required.



As an independent Solar Developer and Operator, AMPYR Solar Europe (ASE) views the corporate PPA market as a powerful driver of the clean energy transition. The increasing demand for long-term, stable renewable energy contracts is accelerating solar development while offering businesses a reliable pathway to meet their sustainability targets. In this competitive and rapidly evolving market, success depends on the ability to develop innovative and tailored PPA solutions.

At ASE we pride ourselves on our ability to create flexible, tailored PPA structures that unlock value for both energy buyers and developers, enabling the continued growth of solar capacity and supporting the transition to a sustainable, net-zero future.”

Tarun Agrawal CEO of AMPYR Solar Europe (ASE)



# Proxy Generation PPA & Volume Firming Agreements

## Price risk

Given the amount of hedging and financial instruments available in the market, Corporates often favour price risk (taking on the risk of a fixed/floor/capped price) because their main reason for entering into Corporate PPA is price predictability. Additionally, this approach may provide the accounting flexibility a corporate need to avoid the Corporate PPA being classified as a derivative.

## Operational & Weather risks

When negotiating a Corporate PPA, negotiations often evolve around an appropriate risk allocation for operational and weather risks.

As corporates may not have the in-depth knowledge of the project specifics (as it is not their core business) or the ability to control the

operation of the project, it can be argued that the generator handles operational risks. The generator is the party that selected the turbines or panels, ancillary equipment and arranged the (terms of the) relevant contracts (including performance, maintenance and curtailment clauses), all determining the actual performance or output of a project. Whilst the traditional PPA is calculated against the actual output of a project (i.e. pay as produced), a 'proxy generation PPA' is calculated against the expected output based on the project's specifics and its power curve, shifting operational risk back to the project.

After agreeing the terms of a proxy generation PPA, the parties agree on a number which reflects the expected operational performance of that project. If the project performs better

than the agreed number, then any upside is for the generator, however if the project performs worse than expected, the generator may suffer. A calculation service agreement with an independent calculation agent is required to assess the expected output of a project which could make arranging this structure costly.

Renewable energy projects are also unique in that each produces variable output throughout the day due to weather intermittency. While weather patterns can be predicted to some degree, they cannot be forecast with 100% certainty or far ahead of time. Microsoft were an early mover in developing solutions for the allocation of operational and weather risk, including the 'volume firming agreement'. This agreement is intended to protect corporate buyers against the intermittency and weather-

related risks inherent to renewable projects. These agreements transfer the 'shaping' risk – stemming from project intermittency – away from the corporate buyers by offering them a 'baseload' or fixed amount of electricity throughout the day. Generators who take on such weather risk will resort to storage and balancing solutions, or they may seek to offset the risk with insurers who are comfortable managing such challenges. Another example is Octopus Energy's "Electric Match" product which matches energy consumers renewable electricity demand needs (in half hourly intervals) with generators generating during that same period. It is intended to provide greater real time transparency and accuracy of renewable generation and consumption.

## 24/7 Model

One of the newest models is the 24/7 model developed by Google. Through its 24/7 CarbonFree Energy Compact with Sustainable Energy for All, Google strives to power its global data centres and offices with sustainable energy, around the clock. This is a bold statement knowing the challenges posed by the intermittent nature of renewable energy, however Google is convinced that new renewable technologies have evolved to a point where they can support consistent power, negating the need for grey energy to provide a baseload. Google's strategy to achieve this 24/7 carbon free goal is focused on developing new contract structures, supporting innovative technologies, and developing new smart solutions to manage their energy consumption. Their goal is to align their electricity consumption with clean energy every hour of every day, everywhere.

## Blockchain PPAs

Since 2020 we have seen an increased use of blockchain in the energy sector, including in the PPA space. Blockchain can be used to create local energy markets (via virtual power plants) by aggregating and matching generator supply and consumer demand in an automated way. Both generators and energy consumers can enter into a contract with a blockchain platform provider. The blockchain provider will agree to provide a 'matching' service where the renewable energy generation is automatically matched with the consumer's demand (and is therefore not trading on the usual electricity trading market). The contract that corporates enter into with the blockchain provider is simpler than traditional corporate PPAs made directly with generators, particularly if the corporate was aggregating demand with others under a club corporate PPA. Blockchain PPAs therefore offer up a real opportunity to open up a route to market for a broader range and volume of corporate energy consumers.

## Overcoming the Challenges of Blockchain

This structure is not without its challenges, which we very much hope can be overcome, particularly:

- Even with blockchain, the licensable activities within the electricity market still exist – generation, distribution and supply. Whilst blockchain PPAs match renewable generation and demand, this is only done virtually and there is still a physical regulated supply between generator and consumer. Parties therefore need to be clear which party is responsible for performing each of these regulated functions and paying necessary grid charges to transport the power.
- As both generator and corporate contract with the blockchain provider (rather than with each other) the generator may not know who the corporate is when it enters into the contract, and there may not be any guarantee or security provided by the blockchain provider for the corporate's obligations

- As the technology is so new, generally we are seeing Blockchain PPAs only for a short-term trial basis (so around a year) so at the moment Blockchain PPAs are not sufficient to 'bank' a project. We expect this to change in the coming year as the technology becomes more established and regulatory hurdles are overcome.

## Multi-technology/portfolio PPAs

[Multi-technology PPAs](#), as their name suggests, cover more than one source of renewable technology (e.g., wind, solar, biomass, hydro or geothermal). Having multiple uncorrelated technologies covered by the same PPA offers a hedge against the intermittence and volatility of a single renewable energy project. This allows the buyer of a multi-technology PPA to manage the shape, volume and balancing risks associated with their consumption profile.

Portfolio PPAs, also known as multi-location PPAs, allow for the bundling in the same PPA price of renewable energy assets using the same technology but in different locations. The hedging element of portfolio PPAs stems from the different weather and geographic conditions of the projects comprising it.

Both multi-technology and portfolio PPAs have typically been available – on the supply side – only from the largest utilities, developers and generators. This is both a result of the renewable assets required and the legal intricacies and commercials. However, smaller developers are now looking to these types of PPAs to optimise their portfolios and find different routes to market.

Similarly, while these PPA forms tend to stem from pre-existing and already operational assets, increasingly sophisticated modelling paired with historical weather data for certain sites is allowing for new build assets to be bundled up with pre-existing sites.

The preference for a single site PPA over a multi-technology or portfolio PPA will depend on a multitude of case specific factors. One such factor is the corporate's consumption profile as compared to the renewable site's generation output (forecasted or actual).

Multi-technology and portfolio PPAs can offer stability against shape risk (i.e., the generation profile of different renewable technologies), volume risk and balancing risk. However, with this certainty of supply comes contractual complexity. One Corporate PPA covering multiple

projects often requires extensive negotiation and can make the already convoluted Corporate PPA contracting process that much more drawn out. These types of PPAs remain most appropriate for large, sophisticated corporates.

### Hybrid PPAs aka Battery PPAs

Hybrid PPAs (HPPAs) are a relatively new type of PPA – initially emerging in Great Britain – which co-locate battery energy storage systems (BESS) with energy generation projects. These co-location arrangements remain relatively rare – less than 10% of the UK's operational BESS are co-located with [wind or solar](#). However, they are becoming an increasingly attractive project type and 300 co-located BESS projects representing 7.2 GW of storage are currently in the development pipeline.

BESS capture surplus energy generated by renewables during peak periods and release it during periods of low production thereby mitigating the intermittent nature of [renewable energy](#). HPPAs offer grid services and asset performance via a structured contract, potentially offering a 'best of both worlds' scenario.

This new 'renewables plus storage' model is rapidly becoming mainstream. Almost 64% of respondents in a recent industry survey indicated that they want to either introduce storage in their portfolio or are looking to increase their [existing storage capacity](#). However, there is no single agreed contractual framework in place for HPPAs and several contractual set-ups have already been deployed. These include:

- Blended renewable and storage premium PPA – this is a pay as produced volume structure whereby contractual arrangements between the renewable and storage assets are shared. A premium rate for all energy to be delivered is charged and this structure builds in the benefits of profile shaping which accounts for the price premium.
- Renewable PPA and storage capacity agreement/optimisation agreement – this arrangement entails two separate agreements: (i) a traditional generation Corporate PPA; and (ii) a separate agreement for the BESS asset. In this scenario, each asset operates independently in accordance with its respective agreement but shares the financial and logistical benefits of sharing a site. Buyers typically want certainty that the generator will prioritise electricity supplies to the buyer (rather than sending the electricity to the BESS asset where market signals indicate it is beneficial to do so).

- Shaped renewable PPA – the two assets share contractual agreements with the aim of mimicking the demand of a particular off-taker looking for an arrangement, this is similar to fixed-hourly profile delivery or baseload PPAs. This results in a hybrid shaped pay-as-produced PPA. Pricing under this contractual model is often dynamic depending on when the energy is delivered.

HPPAs are undoubtedly gaining in popularity but there remain significant challenges to their adoption. According to an industry survey conducted [in May 2023](#), the biggest challenges when considering contracting for co-located projects were the following:

- Modelling revenue from the contracts (53% of respondents);
- Understanding the relationship between contracts (20%);
- Availability of contractual structures (13%); and
- Finding bankable counterparties (12%).

The above listed issues can largely be attributed to the low maturity of the HPPA market relative to the interest it is generating. It is likely that the availability of contractual structures and the understanding of their interplay will cease to be substantial barriers to deal making as market participants are educated about the intricacies HPPAs.



International PPA markets are increasingly complex, with an unpredictable ebb and flow of opportunities. Yet the demand and uptake of PPA and EAC solutions does not seem to have diminished. The PPA business case continues to oscillate as a function of PPA prices, projected wholesale prices, EAC prices, government auctions, evolving NGO guidelines, and other parameters. In this dynamic global landscape, PPA buyers will need a clear yet flexible global renewable electricity procurement strategy to take advantage of new opportunities that arise. This will also require an ability to align internal stakeholders and adapt to changes in the global markets to capture these significant opportunities.



# International Case Studies





# Australia

Corporate PPAs continue to play an important role as the energy transition progresses in Australia.



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Despite a slowdown in the supply of new renewable energy projects, 2023 was another record year for corporate PPAs in Australia, with over 1,700 MW negotiated. This marked the second consecutive year of record deal volumes. Australia is transitioning from an electricity system dominated by coal-fired generation to a system based around renewable energy, particularly solar and wind.

### Historical growth of renewable investments

Investment in Australia's renewable and storage industry boomed in the latter half of the 2010s, reaching a high in 2018. This was driven by the Renewable Energy Target ("RET"). The RET was the Commonwealth Government scheme to increase the proportion of electricity generated from renewable sources and reduce greenhouse gas emissions from electricity generation, which legislated for large-scale generation of 33,000 GWh by 2020. It incentivised participants, particularly retailers, to enter PPAs to receive green benefits known as LGCs (or large-scale generation certificates).

The installation of large-scale renewable energy slowed after the rapid growth to achieve the RET. Although the RET has been fully subscribed and has not been extended by the Commonwealth

Government, State governments have been active in setting increased targets for renewable energy generation to drive investment in the sector, drive down power costs and achieve a greater reduction of emissions.

### The transitioning energy landscape

The Australian energy sector is undergoing a 'once-in-a-generation' transformation. Renewable energy accounted for 39.4% of Australia's total electricity generation in 2023, up from 35.9% in 2022 and 32.5% in 2021. While there is still a fair way to go to reach the Federal Government's target of 82% renewables by 2030, the slow build-up of renewables now has unstoppable momentum.

A natural consequence of the transition to renewables, and the progressive closure of coal-fired power stations, is a move towards a decentralised market with energy production and consumption being accessed on a local level rather than from large utilities. This shift, together with increasing shareholder activism and focus on ESG, has encouraged corporate energy consumers to procure energy directly from local renewable energy assets through the mechanism of a Corporate PPA.

### Significance of Corporate PPAs

The emergence and growth of Corporate PPAs has diversified the market for large-scale renewable energy and they have become instrumental in the energy transition. As electricity retailers met their purchase obligations under the RET and the demand for retailer PPAs slowed, Corporate PPAs have become a key source of on-going investment in large-scale renewable capacity.

### Benefits for corporates

In Australia, there are compelling reasons for corporates to consider procuring energy from clean and renewable energy assets. From a corporate energy consumer perspective, Corporate PPAs allow for price certainty, management of price fluctuations, reduced energy bills and emissions, and have corporate social responsibility and public relations benefits. Corporates should note that the form of PPA in the Australian market has diversified to include smaller retail PPAs and offerings, which may be more accessible to 'mid-scale' buyers.

### Filling the market gap

Following the achievement of the RET, Australian generators and investors found it increasingly challenging to secure medium to long term PPAs from a retailer or state government backed reverse auction or scheme, leaving a gap in the market that corporates have helped to address. Through the entry into Corporate PPAs directly with renewable energy generating projects, corporates have provided these projects with contractual certainty on the price of both the electricity they intend to export and the value of the associated large scale renewable energy certificates. This has assisted projects in meeting bankability requirements, allowed them to gain access to different types of senior debt and stimulated further investment in the sector as institutional investors see key project risks around pricing being alleviated.

### Market performance in 2023

2023 was characterised by a slowdown in the supply of new renewable energy projects attributable to several factors, including slower planning approvals and transmission constraints. Nevertheless, with demand for PPAs outpacing supply, a new record for the volume of Corporate

PPA deals was set in 2023 (at just over 1700 MW), beating the previous high from 2022 (of around 1500 MW).

The major drivers behind this buyer demand were sustainability targets, particularly in relation to net zero transition and wider ESG strategy. Given the increasing number of corporates setting net zero targets for 2025 or 2030, this trend seems set to continue. A combination of financial and sustainability drivers will support on-going strength in Australia's Corporate PPA market.

Queensland has emerged as the leading state for Corporate PPAs, surpassing New South Wales in both 2022 and 2023. State utilities in Queensland have played a pivotal role in signing PPAs with wind and solar farms, subsequently on-selling through retail PPAs to corporate buyers.

### The growing importance of Corporate PPAs

Since 2017, over 165 Corporate PPAs have been signed in Australia, accounting for over 7.4 GW of renewable energy commitments. This highlights the role of Corporate PPAs in Australia's energy transition towards cleaner energy sources.

Although 2023 was a record year for Corporate PPA deal volumes, it was also a challenging market in which there were few deals with new projects and most PPAs were negotiated by larger, experienced deal makers, including the following:

- BHP, MacIntyre and Kaban Wind Farms with storage (QLD), 200 MW
- Ikea: Golden Plains Wind Farm (VIC), 195 MW; Peak Hill & Trundle Solar Farms (NSW), 13 MW; and Tilbuster Solar (NSW), 152 MW
- Telstra: Munna Creek Solar Farm (QLD), 60 MW; and Bundaberg Solar Farm (NSW), 70 MW
- Woolworths, Bango Wind Farm and Darlington Point Solar Farm (NSW), 205 MW
- National Broadband Network: Macarthur Wind Farm (VIC), 29 MW; and Munna Creek Solar Farm (QLD) 27 MW
- Lion Brewery, Woolooga Solar Farm (QLD), 71 MW.

With the market mostly comprised of experienced buyers, there was a marked shift towards larger deals (>100 MW) in 2023. But there were also some new entrants from the corporate and resources sectors, including:

- Arnotts, portfolio of assets (QLD), 21 MW
- Boral, Wellington, and Wellington North Solar Farms (NSW), 29 MW
- Asahi, Clermont Solar Farm (QLD), 15 MW
- Optus, portfolio of assets (multi-state), 60 MW
- CSL, Macarthur Wind Farm (VIC), 39 MW
- Fortescue Metals, Bulli solar farm and battery storage to supply a new hydrogen facility, 339 MW
- Bellevue Gold, Zenith Energy off grid, 80% of energy from solar, wind and battery supplemented by gas.

### New policy frameworks

In late 2023, the Federal Government announced an expansion of the Capacity Investment Scheme (“CIS”), a national framework to encourage new investment in renewable capacity, such as wind and solar, as well as clean dispatchable capacity, such as a battery storage.

The CIS involves the Federal Government:

- seeking competitive tender bids for renewable capacity and clean dispatchable capacity projects to deliver an additional 32 GW of capacity by 2030; and
- providing revenue underwriting to successful CIS tender projects, with the aim of decreasing financial risks for investors and encouraging more investment when and where it’s needed.

In terms of the implications for Corporate PPAs, one possibility is that there could be a reduction in new deal volumes as projects focus on bidding for contracts under the CIS and the big three retailers scale up contracting with renewable energy projects. However, the prevailing view is that it’s unlikely that demand for Corporate PPAs will decline, as that demand is underpinned by emissions reduction, ESG and reputational drivers that will continue.

Nevertheless, the CIS will likely impact the dynamics of the Corporate PPA market. In Queensland, where state-owned utilities have emerged as the dominant entities for contracting with new projects, the majority of Corporate PPAs have been retail PPAs signed with projects that are in commissioning or are operational, with construction underwritten by a PPA signed with one of the state-owned utilities. A similar dynamic could emerge as the CIS scales up.

### Outlook for the future

In the meantime, the shift towards larger deals (> 100 MW) that characterised 2023 has continued in early 2024. In February, Rio Tinto signed Australia’s largest Corporate PPA to date, agreeing to buy most electricity from Winlab’s planned 1.4GW Bungaban wind energy project in Queensland. This followed Rio Tinto’s January announcement of a PPA for the 1.1GW Upper Calliope Solar Farm, also in Queensland.

With volumes for the first half of calendar year 2024 having already exceeded 2023’s record highs, Corporate PPAs are set to continue to play a significant role in Australia’s energy transition.

# Croatia

In the Croatia market, Corporate PPAs are still a novelty and are rarely used.



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With many projects still being in the early development stages, this is perhaps no surprise. However, the market is gradually evolving with increasing attention on solutions that safeguard against electricity price fluctuations. The Croatia PPA market will be an interesting space to watch over the coming years.

## The regulatory landscape

In 2021, Croatia transposed the “EU Winter Package” of energy legislation through the adoption of the Electricity Market Act and the RES Act. As part of this, Corporate PPAs were recognised as one form of off-taking electricity from RES electricity producers. However, the relevant Acts do not explicitly regulate Corporate PPAs. They only acknowledge them by defining a “renewable energy purchase agreement” as an agreement where a natural or legal person agrees to purchase electricity from RES directly from the electricity producer. This definition excludes cases where the producer has a valid PPA concluded with the Croatian Energy Market Operator (“HROTE”) based on feed-in tariffs. As a result, Croatian law permits parties to design their PPAs within the broader framework of obligations law, allowing for flexibility as the market develops.

## Virtual vs direct PPAs

Under the current regime, a virtual PPA can be implemented without additional energy regulatory requirements since it does not involve the direct sale of electricity to the end consumer. Instead, it functions as a contract for difference, and therefore, a supply licence is not required.

However, a direct Corporate PPA would need to fulfil additional formalities. This is due to the current legislation, which regulates market relationships between various market stakeholders (i.e., producers, suppliers, consumers). All stakeholders involved must have their respective licences and can only engage with predefined counterparties on the market. Producers may therefore sell their electricity to suppliers or traders, and not directly to end consumers, and vice-versa. Therefore, to execute a direct Corporate PPA, either the producer or the corporation as the end consumer would need to obtain a supplier’s licence to fulfil the statutory preconditions. This would also invoke other formalities such as additional reporting obligations, divided accounting, etc.

Currently, to the best of our knowledge, there are no “real” direct Corporate PPAs executed in Croatia between a producer and corporate end consumer. However, in 2023 several virtual PPAs were executed. For example, partnerships

have emerged between Professio Energia with its Mazin Gračac wind farm project and Hrvatski Telekom d.d. (part of Deutsche Telekom), as well as between Swiss RES producer and trader Axpo who signed a 10-year virtual PPA with 111 MW windfarm Kunovac (a joint investment between Finnish renewable energy fund manager Taaleri Energia and local developer Encro). Since virtual PPAs are financial contracts for difference, (i.e., hedging arrangements with respect to the price of electricity), they do not require any specific regulatory approvals or licences. This means they are more convenient for all market participants. While waiting on the adoption of relevant legislation on corporate PPAs, virtual PPAs are on the rise.

By 2023, soaring prices on the Croatian Power Exchange (CROPEX) prompted several RES electricity production facilities, set up in the past decade, to abandon the feed-in tariff agreements with HROTE, under which all producers sell all generated electricity to HROTE under a predetermined fixed price before their regular expiry. Instead, these facilities entered into either offtake agreements with electricity suppliers or commercial PPAs. This was the case with wpd and its Croatian subsidiary wpd Adria, which concluded a commercial PPA with Danske Commodities A/S in 2021, in their respective roles as registered producer and trader in Croatia.

## Looking ahead: regulatory developments

Although Corporate PPAs are still in their early stages in Croatia, the market is beginning to recognise their benefits. These agreements provide energy producers with a degree of revenue stability, while buyers gain predictability and the potential for savings, free from the concern of rising prices.

By including the Corporate PPAs in the legislative framework and considering the overall interest of producers and (end) consumers on the RES market, all market participants (including the financing banks) are expecting that the legislation appropriately deals with this matter. This will enable Corporate PPAs to become a standard and preferred model of electricity market participation.

Lengthy approval processes are slowing down RES projects and increasing costs, making it essential to upgrade infrastructure to support the energy transition and industry decarbonisation.

A stable, investment-friendly environment, alongside a general understanding of Corporate PPAs and their mechanisms (including from the perspective of future financing parties) is crucial for the growth of PPAs.

In Croatia, the limited experience with Corporate PPAs makes it challenging to foresee all potential market obstacles. However, as the Croatian market adapts international (including EFET) PPA standards to local legislation, Croatian law governed PPAs are expected to become more prominent among stakeholders. To further facilitate the adoption of PPAs, it is important to create a more supportive environment for RES investments.

# Czech Republic

As subsidy policies become increasingly stringent, Corporate PPAs present an exciting opportunity for new and existing generators.



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The subsidy scheme in the Czech Republic for electricity generators from renewable energy sources is built on two main types of subsidies: (1) the one-off investment subsidy and (2) the operating subsidy. Both of these allow for the continued slow and steady growth of the Corporate PPA market in the Czech Republic.

### Operating subsidies

Operating subsidies can be provided in the form of green bonuses, auction bonuses, or as the feed-in tariff. These forms cannot be combined. In the case of green bonuses, the generator collects a fixed green bonus from the market operator (OTE, a.s.) as well as the amount received from on-selling its produced electricity at market price. In the case of the feed-in tariff, the generator earns the feed-in tariff set by the Energy Regulatory Office (“ERO”) from the “mandatory” buyer, regardless of the current market price. This form of support does not apply to electricity generators brought into operation after 1 January 2022, nor to the aid for keeping the generators in operation, or to the modernisation of the generators.

### The auction system: pros and cons

Another significant way of supporting electricity production from renewable energy sources

is the system of auctions, which represents a market-oriented principle of subsidy. The main advantage of such a support mechanism is the possibility to set the upper limit of the capacity and to define the available amount of subsidy. Given the competitive nature of auctions, this mechanism is a cost-effective way to promote renewable energy resources and further eliminate overcompensation.

On the other hand, auctions impose certain costs and risks for bidders, which in turn may lead to a lower level of participation in auctions, and subsequently may result in more expensive offers. To date, the Ministry of Industry and Trade has called for the first auction for this year to support renewable energy sources, and the public interest in using this kind of support is reportedly still on the rise.

### The role of the Government

The Ministry of Industry and Trade may determine the maximum amount of the auction bonus by a decree. Regarding electricity generators brought into operation or modernised after 1 January 2022, the Government is entitled to modify individual aspects of the regime of green and auction bonuses by government decrees. Each calendar year, the Government will stipulate, among other things, the types of supported

renewable energy resources for the next three calendar years. The regulation for 2022 and the following period, was adopted in the second half of June 2022, with effect from 1 July 2022.

As Czech Republic subsidy policies become increasingly stringent, Corporate PPAs present an exciting opportunity for new and existing generators. The supported renewable energy sources include solar, wind, water, and other sources such as landfill gas, sludge, and biomass. The decree for 2024 was adopted on 14 September 2023, with effect from 1 January 2024. This decree follows and partially amends the decree adopted in 2022.

### An exciting opportunity for energy generators

At present, there is no explicit regulation implementing the rules on the PPAs stipulated in the Directive No. 2018/2001, or on the promotion of the use of energy from renewable sources. This lack of regulation, however, does not prevent the players on the electricity market from concluding PPAs in the regime of the Civil Code. In this respect, the provisions on the substantive content of the contract for electricity supply will apply similarly.

## Corporate PPAs in action

The very first Corporate PPA in the Czech Republic was concluded in the automotive sector in July 2021. Company ŠKO-ENERGO (as purchaser), supplying energy to ŠKODA AUTO, entered the PPA with Ambient Energy (as supplier). ŠKO-ENERGO agreed to purchase electricity from four wind power plants in a total volume of 26.280 MWh per year. The construction of the power plant for the purpose of the PPA will be carried out by the Micronix Group, the operator of a wind park that will be expanded due to the construction. A contract for more than CZK 1 billion was concluded for 20 years with long-term cost fixation and minimisation of price fluctuations.

There have been a number of PPAs following this. The following PPA contract was concluded between a small brewery and an investor, Atlantis Management, for a duration of 20 years. The investor has agreed to build and operate a solar power plant with an output of 35 kWp on the rooftop of the Jarošov brewery.

Currently in 2024, Woodburn Capital Partners is building and will operate a 2.4 MW photovoltaic power plant for the Liberec plant of Magna Exteriors s.r.o., which it will operate for the duration of the 15-year PPA contract for electricity supply. Deutsche Telekom's T-Mobile Czech Republic, Slovak Telekom and CE Colo Czech Republic have also signed cross-border power purchase agreements with Rezolv Energy. Rezolv Energy will generate the required amount of electricity at a wind park in eastern Romania, the construction of which started in June.

The first PPA for solar energy has also been recently concluded: Enerly has agreed to build a 37 MW peak photovoltaic power plant, and to supply Benteler with electricity for ten years under pre-agreed conditions.

## The current PPA landscape

Currently, PPAs contracts are slowly growing in the Czech Republic. Even though there are generally no legislative obstacles to the conclusion of PPAs in the Czech environment, there are a number of sticking points. These include the absence of new renewable projects in the market, as well as the often different ideas between the seller and the buyer about the price of electricity supply.

However, the situation in the Czech Republic may soon change. After a hiatus of several years, operating aid for wind power plants has been reintroduced, which may help to drive renewed investment in this area. Likewise, although operating aid for solar power plants has still not been introduced, large-scale solar parks have also been built for several years, thanks to investment support from the Modernisation Fund. In the absence of operational support, securing sales through PPAs may be a viable option for both of these projects.

# Denmark

Interest around Corporate PPAs in Denmark continues to grow with the number of PPAs increasing significantly in recent years.



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## Denmark's growing PPA scene

Corporate PPAs are well-established in Denmark. Due to its open economy and the international outlook of Danish businesses, many Corporate PPAs agreed by Danish companies are related to activities outside Denmark. As a result, some of the largest and publicly advertised PPAs take place outside of Denmark but with the involvement of Danish developers or sponsors. However, the number of officially announced PPAs in Denmark for renewable energy has increased in recent years. Others are foreign data centre owners wanting to operate their data centres with green electricity. We're also seeing several local off-takers entering into Corporate PPAs.

## Rapid growth of PPAs in 2022-2023

The 2022 and 2023 data show a significant increase in PPAs. For example, in September 2023, the Danish Technological Institute entered into a 10-year PPA with Better Energy to ensure renewable energy to cover the majority of the electricity consumption at their site in Taastrup. In October 2023, PwC entered into a 10-year PPA with the company Better Energy to ensure 100% renewable electricity consumption. The agreement with Better Energy will contribute towards building a new solar park that will supply green electricity for the annual electricity

consumption of approximately 45,000 Danes. In November 2022, Coloplast announced it had signed a 10-year PPA with Better Energy. The PPA will also contribute towards the construction of a new solar park and secures green power for Coloplast's Danish offices and energy production.

## Obstacles to Corporate PPAs

While there is a lot of interest in Corporate PPAs in Denmark, there are some fundamental obstacles making the use of them difficult. There are several legal issues which are not clear and hence it is still difficult for financial institutions to provide financing for Corporate PPAs. There is currently a project in progress to solve these obstacles and it is expected that these uncertainties will be resolved in the near future. That said, the Danish FSA has not yet issued any guidelines when a Corporate PPA may be subject to financial regulation.

## Denmark's 2050 vision: the road to green energy

Notably, the Danish Government has recently published the Danish 2050 Energy Strategy, which aims to achieve 100% independence from fossil fuels in Denmark by 2050.

This is a long-term goal; however, it means

that Denmark must be able to rely solely on renewable energy generation by 2050.

Nevertheless, there has never been a stable, long term legislative framework. Instead, there have been several changes in fundamental and basic factors affecting the investment into renewable assets.

The Government has recently announced that it will be introducing new legislation, which if it follows recommendations from the Energy Commission, we can expect the new legislative framework to be technology neutral and only offer very limited, if any, subsidies. Despite this, there is a general consensus amongst politicians in Denmark that the amount of renewable energy sources shall continue to grow in the coming years, a pertinent topic which was discussed at length during the 2022 general elections.

## Renewables in Denmark



Wind has dominated the renewable energy generation in Denmark for years (energy derived from wind accounts for 47% of the total gross electricity consumption in Denmark and is expected to reach around 92% by 2040) but the number of solar projects are increasing. Biomass has been, and is still, popular.

There are a number of new updates and trends around Corporate PPAs in Denmark, reflecting the increased interest in green energy and the green transition.

Danish companies continue to enter into significant PPA agreements, often with Danish developers but also with international players. For example, European Energy has entered into several new agreements in 2024, including a PPA with DSB for the construction of a new solar park, as well as an agreement with Microsoft, which shows the growing appetite from tech giants to invest in green energy in Denmark.

## The rise of solar power

There has been an increase in solar energy projects as part of Corporate PPAs. Solar energy is now considered one of the most suitable forms of energy for such agreements, particularly when considering the economic and environmental benefits. At the same time, the Danish government is working on resolving some of the legal and financial challenges that have previously hindered the growth of PPAs, and this is expected to further accelerate market growth. These developments are taking place as the EU and Denmark look to intensify their focus on renewable energy with new political initiatives and strategies.

Solar projects may be the most suitable for Corporate PPAs and there are a number of major companies who are interested in procuring electricity directly from solar plants under a Corporate PPA, either for financial reasons or in order to raise their green profile (or both). This political pressure increases the incentive for companies to engage in PPAs as part of their ESG strategies, both to ensure they are acting sustainably and to create a marketing advantage. The pressure on corporates to act sustainably is increasing, so companies will consider PPAs as a

solution even if it's not the best option financially. Corporate PPAs are often referred to as a key tool in order to ensure that companies' are meeting their ESG commitments and targets.

# Finland

Corporate PPAs surge in Finland following increasing price volatility and new energy applications



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PPAs offer both producers and buyers stability and predictability in energy pricing, while promoting the use of renewable energy and the implementation of green energy projects. They are commonly used in renewable energy projects between electricity producers and buyers and can be employed in various situations and projects, such as:

- **Wind Farm Projects:** PPAs can be utilised to sell electricity generated by wind turbines to buyers.
- **Solar Farm Projects:** PPAs can be used to sell electricity generated by solar panels. PPAs can be employed in hydropower projects to sell electricity generated by hydropower plants.
- **Biomass Power Plants:** PPAs can be used to sell electricity when energy production is based on biomass.
- **Green Hydrogen & Hydrogen Derivatives Projects:** PPAs can be utilised, and in many cases are instrumental, to comply with requirements for demonstrating that the hydrogen or hydrogen derivative has been produced with electricity from renewable sources.

PPAs can also be applied to other renewable energy projects, like geothermal energy or wave energy.

## Corporate PPAs: the Finnish electricity market

PPAs are mostly utilised by large technology and industrial companies in Finland. It seems that medium-sized electricity consumers are also interested in purchasing electricity through PPAs, and the PPA market is expected to keep growing. For solar power, PPAs are already being used in smaller projects compared to wind. There are also significant offshore wind projects under development that would accelerate new energy production when realised, even though offshore wind power projects currently still face feasibility challenges and regulatory uncertainties. PPAs are seen as critical for the green energy transition.

## Recent market developments impacting the Nordic energy market: the war on Ukraine

Finland is part of the Nordic wholesale electricity market (Nord Pool), which includes the Baltic countries as well as the Nordic countries. The Finnish system is interconnected with the system of Sweden, Norway and Estonia. Recent market developments have significantly increased the volatility of the power market prices. In particular, the strain of supplementing the supply of Russian imports has hugely impacted the market. Supply of power from Russia was disconnected on the 14 May 2022, and has not been reinstated since.

Sanctions imposed on Russia due to the war in Ukraine establish restrictions and prohibitions on the export of equipment, technology, and services in the Russian energy industry. Sanctions on Russia have been extended multiple times and the situation is likely to continue developing.

## Recent statistics

According to the electricity statistics from the Finnish Energy Industry, the production of Finnish wind power increased by 25.8% from 2022 to 2023. Wind power accounted for 18.5% of electricity production.

In 2023, wind power accounted for 18.5% of Finland's electricity consumption. Finnish wind turbines generated 14,467 TWh of this. The total electricity consumption in Finland in 2023 was approximately 78 TWh, with wind power covering 18.2% of this.

Solar power still accounts for only a fraction of Finnish renewable energy production, but with lots of interest in the field and upcoming projects in different stages of development, it is expected that the significance of solar power within the Finnish renewable electricity market will continue to increase.

## 2023 Overview: wind power

According to the Finnish Wind Power Association (FWPA) report, wind power made significant contributions to Finland's renewable energy production in 2023. During the year, 1,280 MW of new wind power capacity was added in Finland.

By the end of Q2 2024, 60 new wind turbine generators (WTGs) were installed, contributing an additional 377 MW. At that point, Finland had 1,660 WTGs in operation, with a total wind power capacity of 7,322 MW. In 2023 alone, 212 new wind turbines were commissioned, bringing the total number of installed turbines to 1,601, with a combined capacity of 6,946 MW.

Wind power has been a major draw for investment in Finland, with projects completed in 2022 attracting over 2.9 billion euros. The record number of wind turbines built in 2022 (2,430 MW from 437 units) had a significant impact on 2023's production figures. However, the pace of new wind power projects has slowed since then due to rising construction costs and a decrease in electricity demand.

Most of the wind turbines commissioned in 2022 began generating electricity towards the end of that year, and their contributions became evident in 2023's production statistics.

## Finnish key regulations and requirements

In Finland, no license or permit is required for wind power itself. However, several regulatory requirements must be met, including the following:

- A Building Permit, granted by the Municipal Building Control Services, is required for the construction of a new wind power plant and generally for industrial scale solar power plants.
- All "industrial-sized" wind farms require a permit from the Finnish Defence Forces.
- The Finnish Energy Authority must be notified if a power plant is planned to have an expected capacity of over 1 MVA.

Typically, wind farms do not require an environmental permit in Finland, although an Environmental Impact Assessment (EIA) is mandatory. This also applies to solar power plants. Additionally, permits under the Water Act are not usually required, except for offshore wind power projects.

## Navigating the Finnish Electricity Market Act

Connections to the transmission grid are based on the principle of open and non-discriminatory network access. In accordance with the Finnish Electricity Market Act (588/2013, as amended), a network operator is obliged to connect all generation facilities that fulfil the technical requirements outlined and pay the relevant grid fees.

## Role of the Finnish TSO

Fingrid Oyj as a Transmission System Operator (TSO) has a responsibility to develop the Finnish electricity power system and an obligation to connect regional and distribution networks, as well as power plants, to its main grid. On request and against reasonable compensation, the system operator is obliged to provide access to the main grid for electricity consumption sites and power generating installations with technically approved connection solution.

## Becoming an electricity supplier

To become an electricity supplier in Finland, a generator must acquire a party code and enter into an agreement with a company to act as a balancing party. Alternatively, a generator could perform the balancing function itself or enter into agreement with another electricity retailer who has an agreement with a balancing party, (this is called the “chain of open delivery”).

In the context of PPAs, the national regulator allows for both direct and sleeved PPAs as well as financial PPAs. These may be entered into directly between the producer of electricity and the buyer, or electricity may be transported via TPIs.

## Upcoming: hydrogen and hydrogen derivatives

As illustrated by many actors, the key barrier to scaling up the hydrogen market in Finland is still the causality dilemma between supply, demand, and infrastructure. In the current landscape, this means lack of transparency and trust in the market, and many players find themselves having to wait and see.

However, there are several factors that make Finland well positioned to be a European leader in the hydrogen economy. These include its abundance of renewable energy potential and natural resources, leading technology in clean hydrogen and its derivatives, and stable and well-planned infrastructure. Furthermore, Finland has a modern, smart, and robust electricity grid. Clean energy potential is distributed across the country, and it is anticipated that hydrogen production can well be deployed across both the north and south of Finland.

Several hydrogen plant projects are currently at varying stages of development and construction. This is changing the role of PPAs as they evolve to meet the needs of these projects. The requirement of Hydrogen plants for large amounts of electricity, particularly from renewable sources, is driving the demand for new renewable energy generation.

# France

As France reaches a crucial point in its development of PPAs (PPAs), businesses are now fully taking advantage of the latest development in the country's renewable energy landscape: the "generalization phase of PPAs".



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## 2023–2024: A snapshot of the PPA market

From June 2023 until June 2024, around 1,842 GWh of new volume was contracted through PPAs in France. This is an increase of more than 50% in contracted volumes, with an impressive rise in the first trimester of 2024, accounting for 1217 GWh or more than the entire added volume of 2023.

Two major driving forces behind the surge were:

- **Industrial Off-takers:** The need to secure energy prices and to fulfil sustainability targets led to heightened interest from Industrial off-takers
- **Producers:** Producers seeking to profit from higher electricity prices, compared to those granted under the existing tender procedures or French Contracts for Difference (CfD), also entered into more PPAs.

## Looking ahead

The acceleration of PPAs concluded by Industrial off-takers is a statement to the added value of the ENR Acceleration Act enacted in March 2023 which secured and therefore encouraged all companies to conclude such contracts.

Alongside the continuous growth of Industrial off-takers, more initiatives are now put in place to allow, in the near future, smaller companies to have access to the benefits of PPAs, including ETI and SME.

As a way of improving and supporting this momentum, the French regulator is expected to publish, before the end of 2024, a report through which it intends to highlight the main contractual obstacles to the development of the field, to further increase the rise in GWh volume through PPAs.

The emergence of "hybrid" PPAs could also take a huge part in the future development of PPAs, combining renewable energy production with energy storage capacities. This new type of PPA would allow for major companies to have a more fitted energy income, transposing into PPAs a flexibility factor which is already implemented in the wholesale market.

The company Orange is leading the way for hybrid PPAs, having concluded one in May 2024 with producer ZE Energy for a total capacity of 90 GWh of solar energy per year, coupled with a lithium storage capacity of 33,5 MWh<sup>1</sup>.

## 2023–2024: The generalization of PPAs

The momentum of the French PPA market in 2022 and 2023 continued into 2024, particularly for greenfield infrastructures. PPAs are developing in all economic sectors, with a diversification of actors in the conclusion of PPAs compared to the 2022-2023 period. While retail and manufacturing amounted for 70% (respectively 40% and 30%) of all PPAs signed between 2022 and the first half of 2023, they now only constitute 38% of all new PPAs concluded from July 2023, up until June of 2024<sup>2</sup>.

Transport companies are now taking full advantage of the generalization of PPAs, accounting for approximately 17.7% of all PPAs concluded since July 2023<sup>3</sup>. Other sectors like Energy, Banking, the Agri-food industry and Datacenters are also beginning to adopt PPAs as a means of energy sourcing, each contributing to around 8.9% of the total added volume<sup>4</sup>. In the light of the European obligation on the use of Renewable Energy in Datacentre's, their market share is likely to grow significantly.

<sup>1</sup> PV, Orange signe un PPA « solaire+stockage » pour adapter le profil de production à ses besoins, May 15th 2024, [available here](#)

<sup>2</sup> Caggemini, Baromètre des achats d'énergie verte en France, [available here](#)

<sup>3</sup> Ibid / Press release, SNCF Energie et VALOREM signent leur 1er contrat d'achat direct d'électricité verte, à ce jour le plus gros d'origine éolienne en France, [available here](#)/ Press release, June 10th 2024, SNCF Energie et Neoen signent leur 1er contrat d'achat direct d'électricité verte, d'origine photovoltaïques, [available here](#)

<sup>4</sup> Caggemini, Baromètre des achats d'énergie verte en France, [available here](#)

Listed below are some key examples of retail and transport companies leading the way:

- **Les Mousquetaires:** between July 2023 and March 2024, the retail group Les Mousquetaires signed no less than 3 PPAs (respectively with solar farm producer TSE, and wind farm producers Kallista Energy and Valorem)<sup>5</sup>, for a total annual capacity of 197 GWh.
- **SNCF:** Through the main Company (SNCF Voyageurs) and its subsidiary, SNCF Energie, the French railway company concluded 6 PPAs over the last year, 4 of which were concluded since the beginning of 2024 by SNCF Energies<sup>6</sup>, for a total annual capacity of 671 GWh. The use of its energy focused subsidiary by SNCF Voyageurs constitutes a way of fully committing to its goal of having 40 to 50% of its energy consumption satisfied through renewable energy (and 20% through PPA contracts). SNCF Energie aims to deliver SNCF Voyageurs an annual capacity of 1100 GWh coming from PPAs by 2027 / 2028, covering about 20% of the electrical needs for train traffic<sup>7</sup>.

## Brownfield projects on the rise

The number of PPA projects is also increasing for brownfield projects. The contracted volume has expanded by 10% between 2022–2023. This trend will become more pronounced as the “feed-in tariff” contracts for solar and wind installations are expiring.

Between July 2023 and June 2024, approximately 23% of the new PPAs concluded were Brownfield projects<sup>8</sup>.

## Driving innovation: agrophotovoltaic PPAs

2024 confirmed the emergence of Agrophotovoltaic PPAs which started in 2023, with the publication of two decrees in December 2023 and April 2024.

The first decree<sup>9</sup> contains rules how these installations have to respect the protection of the ecological functions of the land or its agronomic potential. Agrophotovoltaic installations need to be designed so that they can be removed without damaging the land in a way that would prevent it from returning to its original state (in application of a reversibility principle).

The second decree<sup>10</sup> lays out a more specific legal framework for the installation of such mechanisms on agricultural, natural and forest land, specifying the urban planning classification and constraints, as well as the authorizations needed for their installation<sup>11</sup>. It also gives more precisions on the services and benefits that the installations are supposed to provide to the land according to article L. 314-36 of the French Energy Code.

## Collective self-consumption

We can also highlight the exponential development of collective self-consumption. Collective self-consumption is a new system that allows to share local energy production between several nearby consumption points. It is of increasing interest to companies. The number of collective consumption operations went from 6 projects in 2018 to 428 active projects in May 2024, with a diversification of stakeholders from public authorities to private companies, registered social landlords or areas of economic activity<sup>12</sup>.

The Ministry for the Economy recently simplified the administrative steps imposed on local authorities wishing to implement this consumption model<sup>13</sup>.

<sup>5</sup> Ibid

<sup>6</sup> Press release, 10 June 2024, SNCF Energie et Neoen signent leur 1er contrat d'achat direct d'électricité verte, d'origine photovoltaïque, [available here](#)

<sup>7</sup> Press release, 22 January 2024, SNCF Energie et SOLVEO Energies signent leur 1er contrat d'achat direct d'électricité verte, d'origine éolienne, en France, [available here](#)

<sup>8</sup> Caggemini, Baromètre des achats d'énergie verte en France, [available here](#)

<sup>9</sup> Decree No.2023-1408 of 29 Decembre 2023

<sup>10</sup> Decree No.2014-318 of 8 April 2024

<sup>11</sup> “Cerema, Climat & Territoires de demain, 9 April 2024, Le décret du 8 avril 2024 cadre l'agrivoltaïsme et l'implantation des installations photovoltaïques sur des terrains agricoles, naturels ou forestiers, [available here](#)

<sup>12</sup> Actu-Environnement, “L'autoconsommation collective monte en puissance”, 8 August 2024, [available here](#)

<sup>13</sup> Arrêté du 10 juillet 2024 relatif aux critères de l'article L.142161 du code général des collectivités territoriales pour les opérations d'autoconsommation collective, [available here](#)

The creation of a public corporation (or “régie”) will no longer be needed for collective auto-consumption projects with an effective power inferior to 1 MW. This simplification should accelerate the development of collective auto-consumption on a smaller local scale<sup>14</sup>.

### A dedicated legal framework: the introduction of ENR Acceleration Act

The ENR Acceleration Act has established a specific regulatory framework around PPAs and aims to accelerate the development of renewable energy in the country<sup>15</sup>. The ENR Acceleration Act set new rules for PPAs, while the overall goal is to halve the administrative processing time for projects.

#### ENR Acceleration Act: producer’s licence for physical PPA’s

As of July 2023, producers entering PPAs must obtain a licence to purchase for resale in accordance with article L.333-1 of the Energy Code. In order not to hinder the emergence of PPAs, the legislator has allowed non-authorized producers to transfer their legal and regulatory obligations to a licensee. These obligations relate to the management of capacity guarantees

(article L. 333-1 2° of the Energy Code) and the rules with respect to imbalances as balancing group managers for electricity suppliers.

The amendment of article R.333-1 of the Energy Code by Decree No 2024-613 of June 2024 gives a clear confirmation that the responsibility to obtain a licence is only relevant for producers entering into physical PPAs. In the case of a sleeved PPA, the aggregator (known as the “sleever”) that executes the contract could obtain the necessary authorisation since it purchases electricity from the producer and then sells it to the off-taker. Article L. 333-1 2° of the Code formalises an existing practice and removes any doubt as to the status of the producer as a party to the PPA. The licence won’t be necessary in case of virtual PPA either, where no energy is being transferred.

As of June 2024, in case the producer decides to transfer its obligations to an existing licence holder, he shall also inform the Minister for Energy of such delegation at least one month before said delegation becomes effective<sup>16</sup>.

#### Public authorities & PPAs

Article L.331-5 of the Energy Code allows public entities to enter long-term PPAs to ensure their access to green energy. PPAs will help the governments and local authorities’ efforts to switch to cleaner energy sources.

However, due to a lack of experience in the conclusion of PPAs in accordance with public procurement rules, it seems that public authorities are not yet taking full advantage of this opportunity. As of June 2024, it appears that only the French railway network company SNCF announced the conclusion of PPAs as mentioned above.

#### Mixed bidding

The ENR law now allows mixed biddings combining PPAs with FIT or CfD mechanisms, helping smaller companies access PPAs by reducing the counterparty (producer) risk. However, producers benefiting from a FIT or CfD mechanisms can’t sell guarantees of origin for the electricity sold via the PPA, which may limit the practical appeal of these hybrid offers.

These PPAs are subject to the control of the French regulator (CRE “Commission de régulation de l’Energie”). However, no mixed biddings have been published yet.

#### Public incentives for multi-buyer PPAs

Multi-Buyer PPAs started slowly to take place in France in 2021.

The Aquitaine Region announced in late 2023 the launch of a call for expressions of interest for a

multi-Buyer PPA aimed at local companies. The call for tender consists in selecting companies which, in agreeing to buy electricity from the same production plant in the form of a PPA, would benefit from public incentives.

This kind of initiative from public regional authorities could serve as a turning point in the development of PPAs as a means of local distribution networks. In May 2024, a memorandum of understanding was signed by 11 companies expressing their intent to participate in this project<sup>17</sup>.

#### Establishing a PPA’S Guarantee Fund for Industrial Companies

The GER guarantee fund (“Garantie Électricité Renouvelable”), set up by the French government and BPI France, has been operational since 1 September 2023. It takes the form of a bank guarantee and should not be considered as state aid. Its role is to cover 80% of the PPA remuneration in the event of default of three monthly payments by the off-taker.

The first PPA contract backed by the GER guarantee was concluded in October 2023.

<sup>14</sup> PV Magazine, “Un arrêté simplifie les démarches pour les projets d’autoconsommation collective des collectivités”, 18 July 2024, [available here](#)

<sup>15</sup> D. MANDELLI, French Senate Report on behalf of the commission for spatial planning and sustainable development, 2022, [available here](#)

<sup>16</sup> Article 3, 12°) of Decree No. 2024-613 of 27 June 2024

<sup>17</sup> GreenUnivers, Un PPA avec onze acheteurs en préparation en Nouvelle-Aquitaine, 9 July 2024, [available here](#)

# Germany

In 2023, there was a record number and volume of PPAs in Germany.



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Whilst 2024 had a promising start, the good prospects for PPAs in Germany have been clouded by price developments and discussions about splitting Germany into different price zones. However, PPA activities have been picking up again in Q3, and virtual PPAs have become more and more popular.

## Will the positive trend continue?

Public sources assume that 42 PPAs with a term of at least five years adding up to a capacity of 3.6 GW were concluded in Germany in 2023. This exceeded the overall capacity of PPAs concluded through 2019 to 2022. This trend has slowed down, although 16 PPAs adding up to a capacity of 648 MW were made public in Q1 2024.

It must be noted that nearly all PPAs concerned solar PV or offshore wind assets. From an offtaker perspective, data centre operators have gained more and more interest in PPAs. Being in line with the more general awareness and importance of sourcing green electricity caused by sustainability initiatives and regulation like CSD, this development also is driven by recent German legislation. Under the German Energy Efficiency Act (“Energieeffizienzgesetz”, “EnEFG”) operators of data centres must cover their electricity consumption from renewable energies by 50% from 2024 onwards and by 100% from 2027 onwards.

An upcoming trend are PPAs that will provide the required green electricity to produce green hydrogen. As this reflects the intensified efforts of the German legislator and government to get the hydrogen economy started, we expect this trend to strengthen in the future.

A downside of the significant ramp-up of renewable electricity is the rising number of hours with negative prices. Negative prices occur during times when the sun shines and the wind blows (so called “Hellbrise”) and/or when demand is low or not flexible enough to respond. In 2023, Germany registered a record high of 301 hours of negative prices. For 2024, the forecast suggests a new record again. In April and May alone, 128 hours of negative prices were monitored.

## Sunny conditions for Solar PV

A further trend is a rise of rooftop solar PV projects that are marketed via PPAs. This area is especially interesting for industrial and commercial offtakers that are keen to improve sustainability and at the same time want to increase the market value of their real estate.

Whilst being a relatively new development, there are already quite a few suppliers on the market offering different options of structuring rooftop projects. The range varies from (i) traditional EPC

offers to real estate owners who will then operate the roof-top solar PV plants to (ii) a full-service approach of project developers which include planning, construction and operation of the roof-top solar PV plants which remain in the property of the project developer.

By implementing the Solar Package II (“Solarpaket II”), the German legislator aims at further incentivising the boom in Solar PV. The package includes several measures to ensure that putting solar PV plants into operation will become easier and faster. Specifically:

- the option of community building supply (“Gemeinschaftliche Gebäudeversorgung”) allows for supplying the near neighbourhood without the need of feeding into the public grid;
- providing “Mieterstrom” is now possible to tenants of commercial buildings and ancillary facilities;
- the obligation for direct marketing of solar PV plants of more than 100 kW on commercial buildings is eased up - this aims at lowering costs for direct marketing of excess electricity that have been identified as a hurdle for installation of assets with higher capacity; and
- the feed-in tariff for commercial roof-top solar PV plants has been raised.

These measures have the potential to further strengthen the rising number of rooftop solar PV plants.



## Outlook for the German PPA Market

Whilst the outlook for the German PPA market remains good, prospects have slowed due to the development of electricity prices as well as legal and regulatory challenges.

### Implementation of RED III Directive

The implementation of the RED III directive may positively impact the attractiveness of PPAs in Germany.

This refers to the so-called “acceleration areas” (“Beschleunigungsflächen”) in which permitting of renewable assets will be sped up by lowering requirements under nature and species protection law. The draft implementing act also covers more general measures to accelerate the permitting process, including partly digitalising permitting procedures.

The draft act also provides for setting up so-called “infrastructure areas” (“Infrastrukturgebiete”) that allow for faster permitting of grid expansion projects without a need for an environmental impact assessment.

During consultation of the draft implementing act, the stakeholders identified that the main hindrance for putting renewable assets into operation would not be tackled.

At least for offshore projects establishing grid access, not the permitting procedure, would be the bottleneck.

### Slow grid expansion and potential price zone split

Grid expansion has proven to be one of the main challenges to be tackled for making German Energiewende a success. Accelerating permitting procedures and grid expansion on all voltage levels only covers one side of the process.

Rising grid surcharges and their allocation need to also be addressed. This is exemplified by the discussions of not building the electricity highways (“Stromautobahnen”) heading from north to south of Germany as underground cables (as currently planned) but as high-power voltage lines above the ground (as initially planned).

An alternative may be direct wire solutions that connect renewable assets and off taking installations. Off-site direct wire solutions can also be an option to shortcut the grid (and associated costs).

Both aspects, the need for grid expansion and the associated costs, highlight a topic that all stakeholders in the PPA market are currently discussing: the possibility of splitting the German

electricity price zone. After ACERs proposal in 2022, the discussion gained momentum as the bidding zone review by the German TSOs announced for 2024 may be decisive for future developments.

Different price zones would lead to adjusted grid surcharges in the different zones depending on the exact cutting. In addition, the requirement of congestion management and associated costs would be addressed.

The uncertainty about the mid to long term developments affects determining profitability of renewable projects as this depends on the location and the applicable price zone. Currently leading to a “wait and see” approach in some cases, it does not necessarily affect the current market momentum of PPAs. It is possible (and sensible) to include provisions covering the possible developments in the agreements for both parties, usually as part of the change-in-law provisions.

### Looking ahead: Changes in electricity market design

The long tenors of PPAs mean that amendments to the underlying electricity market that may become relevant in the long term need to be considered.

In this respect, the options paper [“Electricity market design of the future - options for a secure, affordable and sustainable electricity system”](#) from the German Federal Ministry for Economic Affairs and Climate Action (“BMWK”) may give an indication where the German electricity market is heading.

The quite elaborated and detailed paper provides for a capacity mechanism allowing to balance the variable generation from renewable assets. This could lead to lower curtailment and associated redispatch costs, making production and output more reliable for offtakers.

The paper also discusses four alternative options for securing a framework for investments in renewable assets in the future. The options include contracts for difference and refinancing contributions. According to the paper, these measures only aim at sites that are not profitable enough for financing via PPAs. However, PPAs can be an additional financing option if the discussed measures come in place.

If and in what way one of the options discussed in the paper will be realised is unclear, so it will be worth following any further discussions.

# Hungary

The conclusion of Corporate PPAs has not been a widely used practice in Hungary until very recently.



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The first officially announced Corporate PPA was concluded in 2022, but Corporate PPAs are quickly gaining popularity and acceptance in the industry due to regulatory changes and market circumstances.

## Reasons for the slow start

The main reason for the delayed start was the feeding-tariff based state subsidy system, KÁT, where eligible renewable electricity generators sell all output to the Hungarian TSO, MAVIR, at a fixed price. Since 2017, KÁT has coexisted with the premium-based METÁR subsidy scheme. In METÁR, the RES generators receive a subsidised electricity price and a premium over the market reference price (based on specific day-ahead prices of the Hungarian Electricity Exchange, HUPX) if the subsidised price is higher than the reference price. However, this must also be paid back if the subsidised price is lower than the reference price.

Furthermore, companies in Hungary had and still have the option to purchase certificates of origin (whether from the generator or from an electricity trader) which attest that the electricity purchased was generated from renewable sources.

Therefore, companies with an agenda for sustainability and environmental responsibility can purchase certificates of origin without necessarily having to directly conclude a PPA with the renewable generator.

## CPPAs on the rise

In METÁR, the renewable generators must go out to the market and conclude PPAs with customers or traders. Capacities tendered through METÁR were lower than the demand and became irregular as there were no new tenders issued since 2022. This, coupled with rising market prices, has meant that no-subsidies solar project development plans have started to crop up on a larger scale. Additionally, the first KÁT feed-in licenses have started to expire, and those generators needed to find a sensible route to market.

With the fall away of the secure KÁT fixed tariff and the uncertainties of METÁR subsidies in a high-price environment, a secure PPA became a key element of bankability for renewables projects.

These factors described above have led the way towards Corporate PPAs in Hungary in multiple shapes and forms.

## Models of Corporate PPAs

### Sleeved PPAs

Pure sleeved PPAs may be difficult to implement in Hungary as in this model the corporate would need an electricity trading license, which might prove to be too burdensome. However, traders have developed solutions for physical delivery CPPAs through innovative balancing circle membership arrangements. The contractual structure of such sleeved PPAs may be more complex, but can eliminate the need for the trading license for the corporate.

### On-site PPAs

On-site PPAs are also getting more popular, due to large off takers feeling the pressure of higher energy prices and the risks of high price volatility. These challenges are mostly related to grid and local wire connections as well as bankability, because the deviating land registry practices often make it difficult to have appropriate securities and pledges in place. Different legal structures are arising in order to cope with these challenges, and in the past year regulatory changes were introduced that support on-site solar installations in particular. On-site solar projects combined with storage technologies are becoming popular. thanks to, among other factors, funding available from the EU's Recovery and Resilience Facilities (RRF) and newly introduced corporate income tax benefits.

### Virtual PPAs

Virtual or synthetic power purchase agreements (“VPPAs”) provide a more clear-cut alternative; however, some regulatory challenges remain. Project companies that conclude VPPAs to sell the electricity generated by them may be dealing on their own account with financial instruments (contract for difference being a hedge-like arrangement). If this is performed as a regular economic activity, it constitutes an investment service activity which requires an investment services license from the National Bank of Hungary (“NBH”). However, under certain conditions, the conclusion of VPPAs may still be exempt from the NBH’s authorization. Therefore, it is important to carefully assess such conditions and implement the VPPA structure in such a way that the exemption will apply.

### Tax challenges: Robin Hood Tax

From a business perspective, probably the greatest challenge for merchant PPAs of any type is the so-called Robin Hood Tax, i.e., the income tax on energy suppliers under Act LXVII of 2008,

which is at 31% of the tax base of an electricity generator (except for generators below 50MW having KAT or METÁR subsidy). Further, with respect to the tax year of 2023 and 2024, the Robin Hood Tax was raised to 41%.

### Outlook for Corporate PPAs in Hungary

Corporate PPAs are becoming more widely used in Hungary despite the regulatory challenges. We expect the uptake of Corporate PPAs to further accelerate because of market circumstances and regulatory updates, as well as the increasing acceptance by financing institutions and better understanding of contractual structures by off-takers.

# Italy

As Italy enters a new era where the PPA legislative and regulatory framework is evolving rapidly, the opportunities for generators and off-takers are endless.



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## The Italian corporate PPA Market: a period of growth and transformation

In the last few years, the Italian renewables market has entered a period of rapid growth and transformation. This is the result of the country's favourable climate and a legal framework known as "Conto Energia", which provided economic support to the renewable energy sector through the "feed-in-tariffs" scheme until the achievement of a proper financial grid parity. This gave a guaranteed payment for electricity generated and exported by PV plants to the grid. The scheme has changed in the last few years towards a more "cfd structure" to balance the electricity price risk.

## The mandatory purchase regime

Since 2008, generators have opted more often for the mandatory purchase regime (ritiro dedicato) than for PPAs. The mandatory purchase regime is a simplified purchase and resale arrangement, entered between the generator and Gestore Servizi Energetici (GSE), the Italian national grid operator. GSE purchases and resells the electricity to be exported to the

grid at a zonal price or a minimum guaranteed price and, on behalf of the generator, transfers the fees for the use of the grid (dispatch and transmission fees) to distributors and to transmission system operators (TSO). However, since the beginning of 2013, the GSE has been charging generators of renewable energy who benefit from the mandatory purchase regime further costs, such as imbalance costs ("costi di sbilanciamento"), costs originating from the participation of the GSE in the intra-day market ("mercato infragiornaliero") and other relevant administrative costs for the services it supplies for the mandatory purchase regime. This trend, along with a significant drop in the electricity demand and a sharp decrease in prices, pushed many generators, including electricity generators on large scale, to explore how to increase their revenues by selling electricity power generated by their plants.

Therefore, short term PPAs became a valid alternative for generators to the mandatory purchase regime.

## Understanding the types of PPAs in Italy

PPAs in Italy are bilateral contracts, executed "over-the-counter" at a purchase price directly negotiated with energy traders/wholesalers. These energy traders/wholesalers then negotiate with the TSO the price deriving from energy generation.

In a limited number of occurrences, where a generator and a corporate can be physically connected through a private network, generators may find it convenient to enter into a Corporate PPA to sell directly to a customer who has a stable need for large volumes of energy.

## Emergence of long-term Corporate PPAs

Although no regulatory provisions prevent parties from entering into long-term Corporate PPAs, in the last five years Corporate PPA structures have started to be used in Italy, both in the form of physical and synthetic Corporate PPAs.

## Drivers for the growth of Corporate PPAs

This positive trend may be explained by several reasons:

- The effects of the crisis of raw materials, and especially the stable increase of the market price of natural gas due to the Russia-Ukraine conflict, have rapidly overcome the drop in energy demands caused by the COVID-19 pandemics' outbreak, causing a sharp rise of the electricity price to the maximum price peak ever achieved by the Italian electricity market in the last decade.
- Regulatory changes allowing multiple consumers to share supply contracts (through "energy communities") and simplifying the use of PPAs for non-professional actors are a promising factor.

## The impact of COVID-19

The COVID-19 outbreak halted the energy transition's acceleration which had started in early 2019 due to the drop in energy demands and the electricity price curve forecast until 2024.

However, this setback has been overcome by a sharp increase in electricity prices that, on the other hand, has started decreasing in the last 18 months. Despite the long-term returns associated with investment in renewables, risks associated with merchant price off-taker default are not helping the creation of a healthy environment for foreign investors looking to invest in Italy's renewables industry.

## The changing regulatory framework

We are currently entering a new era where generators and off-takers will be affected by new developments in the legislative and regulatory framework governing incentive schemes in the solar market. New Feed-in Tariff (FiT) schemes will be available for renewables by end of 2024 with apparently favourable strike prices (85 EUR per MW) for applicants through auction procedures, based on cfd schemes managed by GSE. The regulatory framework will be approved in the coming months but the news has altered the market as many producers would prefer to opt for a FiT scheme rather than running a risk of the electricity price market volatility or entering into Long Term PPAs.

Although they could prefer taking a different market approach if they need to build the solar parks (NTP/start of works) before the opening of the first actions, since they would then be prohibited to have access to new schemes.

## Electricity prices: what to expect

After the turmoil caused by the outbreak of the Ukraine war and the sharp increase in the gas prices which made the electricity prices soar dramatically, in 2023 the electricity prices have slowly returned to the general average price of under €100/MWh, registered until 2021. Therefore, it seems that there is no longer a need for governmental actions to stabilise electricity prices, as market prices are naturally adjusting.

In this situation, PPA prices are going down considerably and steadily.

# Morocco

Described as a “[renewable energy superpower](#)”, the Kingdom of Morocco has exceptional wind and solar energy potential, estimated at 500TWh per year. This reserve, combined with strong political stability, makes Morocco one of Africa’s leaders in renewable energy production.



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As of 31 December 2022, renewable energy accounted for [around 40% of installed electricity generation capacity](#). The Kingdom has set itself the target of generating at least 52% of its electricity from renewable sources by 2030. Corporate PPAs play a key strategic role and are gradually being developed.

## A Necessary Tool for the Development of Moroccan Industries

The roadmap, [launched in 2009](#) by King Mohammed VI, was coupled with the drafting of Law 13-09 on renewable energies (“Law 13-09”). This first law established an appropriate regulatory framework to “encourage the development of renewable energy installations in Morocco”. Law 13-09 has been the subject of two amending and amplifying laws - the first being law 58-15 dated January 12 2016, and the second, law 48-09 (“Law 48-09”) dated February 27 2023 (the “Amended Law 13-09”). These two amendments aimed to remedy the shortcomings of the original text and to make the sector more attractive.

At the same time, the Moroccan legislator also reformed the system of self-generation of electricity at the end of 2022<sup>18</sup>.

## Morocco’s Strategic Priorities

According to the [Ministry of Energy Transition](#), these various reforms promote a model of electricity production that is decentralised, low-carbon and competitive. At the same time, the Government has made the development of Morocco’s manufacturing industry one of its strategic priorities, along with the fight against climate change, without encouraging it to adopt a “green” approach. In addition to Amended Law 13-09, companies in Morocco will also be incentivised to implement low-carbon solutions by the recently implemented EU Carbon Adjustment Mechanism (CBAM), which imposes on Moroccan exports a carbon tax calculated [based on embedded carbon emissions](#).

In this context, Corporate PPAs appear to be an appropriate and efficient tool for Moroccan companies to initiate their energy transition while maintaining their sustainable and responsible growth prospects, and to control their supply and production costs at a time of high energy prices.

## The Emerging Role of Corporate PPAs in Morocco

Corporate PPAs are slowly emerging in the Kingdom of Morocco. On 16 February 2023, Canadian company Aya Gold & Silver signed a 20-year Corporate PPA with Energie Eolienne du Maroc. The CPPA will cover 100% of the electricity needs of the Zgounder mine, located to the south-east of Marrakech, for the duration of its operation, and will [prevent the emission of 56,000 tonnes of CO2 equivalent per year](#).

In 2022, InnoVent signed a Corporate PPA with STMicroelectronics, the world’s leading manufacturer of semiconductors, for the sale of electricity in 2022. With an expected annual production of more than 80 GWh, the wind farm will contribute to [reducing CO2 emissions by 60,000 tonnes per year](#).

The same year, the Emirati IPP “Amea Power” and Amendis, a subsidiary of Veolia Morocco signed a Corporate PPA with power generation capacity of 35 MW and a 25-year duration. It also aims at decarbonising the provision of portable water treatment and transportation in the Tangier area. It combines both decarbonisation and public service improvements.

<sup>18</sup> Law 82-21 on self-generation of electricity

Amea Power has announced that other Corporate PPAs of this kind are expected to be signed in other areas of Morocco, [notably in Fes-Meknes](#). It already announced in April 2022 that it had been [awarded two solar projects with a total capacity of 72 MW](#), following a successful international process.

Finally, some Corporate PPAs are to be concluded in the Agri-food sector. In 2022, for example, the [IPP Nareva signed a 2 MW Corporate PPA with the Lesieur group](#) to reduce the group's CO2 emissions.

These examples show that the legal framework is adequate for the emergence of Corporate PPAs in different sectors of the economy, even if minor regulatory adjustments could speed up the process.

### Amended Law 13-09: Perfecting the Framework for Corporate PPAs

**Firstly**, the Amended Law 13-09 regulates the producer and the development of its generation facilities more than the commercial relations it enters with its off-takers.

Article 26 of the Amended Law 13-09 expressly authorises the conclusion of electricity contracts

between a producer and one or more off-takers if the off-takers are connected to the national medium-voltage, high-voltage, and very high-voltage electronic network granted to the TSO<sup>19</sup>.

This gives developers access to all national electricity grids and a particularly large potential customer base of SMEs and large companies. The duration of the contract, the guaranteed volume and the price are freely negotiated between the parties. Similarly, the Amended Law 13-09 does not specify whether the CPPA is subject to a “take and pay” or “take or pay” system.

Generation facilities constructed for the purpose of Corporate PPA projects are governed by Chapters 2, 3 and 4 of Amended Law 13-09.

**Secondly**, Law 48-09 introduced two distinct procedures depending on a facility's capacity<sup>20</sup>:

1. A facility with a capacity of less than 2 MW is subject to a prior declaration to the Ministry, whereby only administrative and technical information is filed before the administration takes a decision;
2. If a facility has a capacity of more than 2 MW, there is a two-fold authorisation process:

(a) Prior to building the facility, a development permit must be issued by the Ministry of Energy. This development permit is valid for three years, during which time the project must be carried out<sup>21</sup>. It is only delivered if the operator (i) provides administrative and technical information<sup>22</sup>, (ii) provides a bank guarantee or security deposit<sup>23</sup> and (iii) undertakes to apply the principle of national preference in all works, supply and service contracts relating to the project<sup>24</sup>. In addition, facilities with a capacity above 2MW are still subject to the “solar map” (a requirement which already existed under Law 13-09, but for which the applicable regulations were only published in 2022 – i.e. more than a decade after the initial Law 13-09 was enacted). Per this requirement, the facility must be located in zones defined by the administration.

(b) On completion of the facility's construction and before the production site is put into operation, the developer must apply to the Ministry of Energy for a 25-year operating licence, renewable once<sup>25</sup>.

Thirdly, in order to gain access to the national grid, two agreements must be concluded between the producer and the national electricity transmission system operator: (i) a grid connection agreement under which the developer connects its facility to the national grid and (ii) a grid access agreement under which the developer is granted the right to feed electricity into the grid, subject to compliance with certain technical and financial conditions.

**Finally**, the development of the Corporate PPAs required the introduction of a monitoring system and proof that the energy purchased under the Corporate PPA was from renewable sources. In response, Law 40-19 provides that any operator will now be able to obtain “certificates of origin” certifying that the electricity fed into the grid is of renewable origin. This system will necessarily be specified by implementing decrees. While the introduction of certificates of origin is to be welcomed, it will be necessary to analyse in detail the legal nature of these certificates, particularly their emissions, their transferability and whether they can be used for value. At present, the system is not operational. This is problematic for many industrial operators who need to justify the decarbonisation of energy production sources at their Moroccan sites but are unable to do so in practice.

<sup>19</sup> Office Nationale de l'Electricite et de l'Eau Potable” (ONEE)

<sup>20</sup> Articles 3 and 4 of Amended Law 13-09

<sup>21</sup> Article 11 of Amended Law 13-09

<sup>22</sup> Articles 8 and 9 of Amended Law 13-09

<sup>23</sup> Article 13 of Amended Law 13-09 - This measure will have to be specified by decree

<sup>24</sup> This measure will also have to be specified by decree

<sup>25</sup> Article 13 of Amended Law 13-09

## Recent advancements in Morocco's Renewable Energy Landscape

Morocco is making significant strides in the development of its renewable energy sector, as evidenced by recent regulatory developments. On January 31, 2024, the Board of the National Electricity Regulatory Authority unanimously approved the national electricity system's capacity to accommodate renewable energy sources for the period spanning 2024 to 2028. This decision establishes a substantial target, with a total capacity for integrating renewable energy reaching approximately 7,236 MW, including 1,323 MW specifically allocated to distribution networks.

## Regulatory Challenges and the Future of CPPAs in Morocco

However, several regulatory texts remain pending publication, including those related to the issuance of "certificates of origin" and those concerning auto production.

A draft decree adopted by the government was released in September 2024 and specifies the conditions for issuing and managing certificates of origin for renewable energy.

It designates the Moroccan Agency for Energy Efficiency (AMEE) as the body responsible for issuing and managing these certificates. The decree outlines clear conditions and procedures for the registration of renewable energy installations and independent producers. It also details the steps and documents required for issuing certificates of origin and establishes procedures for accrediting surveillance bodies to ensure compliance with both national and international standards. This draft decree aligns with Morocco's commitment to advancing renewable energy and supports the broader goals of reducing carbon emissions and enhancing energy transition efforts.

Concerning the self-generation/auto-production legal regime created by law 82-21, the regime is not fully effective in the absence of implementing decrees, it is not possible for industrial companies to own their own facility and to be self-sufficient. Instead, they enter into Corporate PPAs with power producers who:

- rent a space on site;
- develop an on-site facility which is connected to the grid but which uses a stopper for the renewable energy to enter the national grid;

- sell electricity directly to the site owners; and,
- the Corporate PPA provides that the facility will be transferred at the end of the contractual term.

The Bird & Bird team in Morocco regularly advises its clients on implementing Corporate PPAs. This includes recently advising Renault in contracting two Corporate PPAs for its industrial plants in Morocco. The electricity supply contract, with a volume of 155 GWh, was concluded for a term of twenty years.

This phenomenon highlights a significant shift in the Moroccan energy landscape, as self-generation is inherently at odds with the concept of CPPAs.



# The Netherlands

Corporate PPAs are gaining popularity now that the subsidy amounts for renewable energy are declining.



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## The Dutch Regulatory Environment

The EU has set targets for renewable energy generation and the reduction of CO2 emissions to halt global warming for its member states. The climate goal targets for the Netherlands are extremely ambitious and until now the Netherlands has struggled to meet these targets. The Netherlands Environmental Assessment Agency (PBL) has concluded that the Netherlands will likely fail to reach its 2030 goals and extra policy is needed. It is estimated that the 'proposed and adopted' policy will lead to a reduction of 45-52% which falls short of the target goal of 55% in 2030. However, the Dutch government is actively working on various methods to achieve these climate goals such as the phasing out of coal plants on the short term and new wind energy tenders for the longer term. Additionally, large quantities of PV panels are being installed in dedicated ground-mounted solar parks as well as on rooftops, and, both onshore and offshore wind parks and significant investments in hydrogen facilities are underway.

Restrictions on the available transport capacity (i.e. large-scale grid congestion) is one of the current bottlenecks in the development of

renewable energy projects and requires creative solutions. The Dutch regulator (ACM) has taken several measures to mitigate these restrictions, such as a priority lane for scarce grid capacity to favour parties who reduce grid congestion and/or realise essential social services (the so-called prioritisation framework), stimulating flexible grid use, congestion management measures, alternative access rights (non-firm ATO's, time based and group based), time of use tariffs, the use it or lose it-principle and providing room for experiments.

## Supporting Investment in Renewable Energy Projects

The Dutch Government has implemented a variety of measures and regulations to support investment in renewable energy projects such as an updated SDE++ (Sustainable Energy Production and Climate Transition Incentive Scheme) regulation and the EIA (Energy Investment Allowance). The SDE++ provides subsidies for the use of techniques for the generation of renewable energy and the reduction of CO2. Subsidies under the SDE++ scheme are calculated on the basis of reduced emissions rather than per kWh of electricity generated, as was the case under its predecessor, the SDE+ scheme. The SDE++ is an

operating subsidy. This means that a subsidy is received during the operating period of the eligible project. In 2024, a budget of € 11,5 billion was available for the SDE++ and the government i.a. decided to include the category 'Hydrogen from electrolysis, grid-connected with renewable power purchase agreements'. The SDE subsidy is only available for the production of fully renewable hydrogen. This category assumes that the onshore electrolyser is sourcing renewable electricity from an offshore wind farm, and that the owners of the electrolyser and the wind farm have agreed in a PPA how much electricity will be supplied and at what price. Additionally, (i) backward banking is no longer permitted for the Solar PV and Wind categories, (ii) excess profits will be offset against the subsidy received and (iii) no subsidy is provided for generated electricity for self-consumption.

Companies investing in renewable energy and energy-efficient technologies may also be entitled to the EIA, which allows companies to deduct up to 40% of qualifying investment costs from its taxable income, in addition to any permitted standard depreciation. To apply for the EIA, the investment must be included in the [Energy List 2024](#). It is possible to submit a proposal for investments to be included in the Energy list for the next year.

### Mandatory Unbundling

The Netherlands has implemented EU unbundling requirements in the most restrictive way possible, prohibiting electricity and gas network operators from being part of a corporate group that includes companies generating, supplying or trading in energy in the Netherlands (the “group prohibition”). The group prohibition has adversely affected the credit worthiness of the traditional offtakers, i.e., utilities, stripping the grids of their balance sheet and taking away security for financing. Long-term Corporate PPAs with corporate offtakers with a high(er) credit rating provide an alternative way for generators in attracting cheaper finance and meeting their bankability requirements.

### The Rise of Corporate PPA Structures in The Netherlands

Mandatory unbundling requirements in the Netherlands means that it is possible for a generator and a corporate consumer to enter a Corporate PPA, without needing a utility to enter into a “back-to-back” PPA with the corporate consumer. This is because the “sleeving” of the electricity is done by the grid operator, rather than by the utility. Rather than entering a “back-to-back” PPA with a utility, the corporate consumer can transfer its program responsibility to a trading or balancing party, thereby reducing costs of its energy consumption.

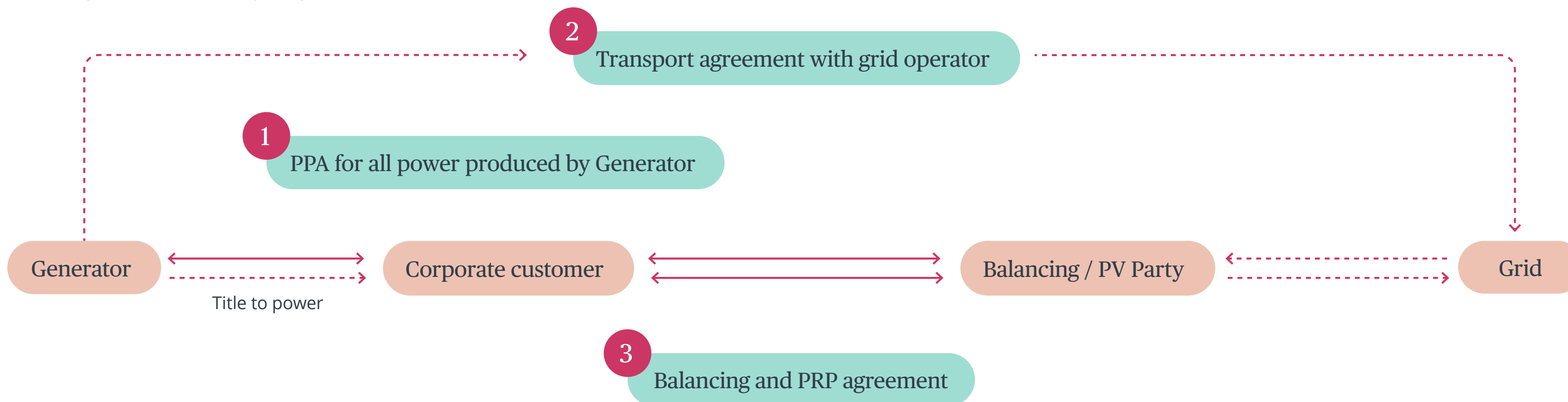
### PPAs Cornerstone in Project Finance

Increasing the deployment of renewable generation assets is capital intensive and, as with any project finance structure, large amounts of funds need to be committed before any revenue is generated by the project company. Typically for project finance structures, the security for the lenders sits in the long-term projected cash flows of the project, rather than the company’s assets or balance sheet. A solid (Corporate) PPA is crucial to ascertain this, and it helps making a project “bankable”.

Well-structured Corporate PPAs help to fill this void. A long-term PPA with a credit-worthy corporate counterparty that has a stable preagreed price formula, ideally containing cap and floor mechanisms to mitigate the volatility of the electricity prices, could secure a steady revenue for the project to repay its debt and be the difference between the project being “bankable” or not.

### Introduction of the Guarantee Fund

The Dutch PPA market is steadily developing, but most of the PPAs are still concluded by big market players with a solid credit worthiness. The mid and small market players are however also hungry to take part in the PPA market. InvestNI has tasked Rebel with the [research](#) on whether a guarantee fund would increase and mature the market for corporate PPAs in the Netherlands. Given that the SDE subsidy is reducing over time, there is the need to secure cash flows for projects. Rebel concluded that under the proposed guarantee structure (which is still to be further developed) developers can conclude a guarantee covering the income loss in case a corporate goes bankrupt.



The fund would step in for (part of) the income loss if the agreed PPA price is lower than the market price at the time of bankruptcy of the corporate. The costs for such guarantee are covered by a premium paid by the developers. As such the researchers conclude that a guarantee fund not only improves the bankability of projects but also opens up the PPA market to more parties. Details of the guarantee structure can be negotiated to adapt to the PPA structure and to optimise the desired risk profile.

Rabobank introduced a guarantee product (PPAssurance) to enable companies without a credit rating to enter into a PPA. This product, in cooperation with Eneco, enabled two Dutch food and agricultural companies (Plukon and De Heus) to enter into a PPA to purchase electricity from offshore wind farm Hollandse Kust West VI (Ecowende) and opens the door for a larger group of companies to purchase green energy through a PPA.

## Corporate PPA Benefits for Consumers & Generators

Market parties are getting more and more familiar with the corporate PPA structure and are increasingly exploring such structures to solidify business cases for the development of renewable energy projects.

On the one hand they provide corporate consumers with the ability to accurately forecast their cost of energy over a long term and increase their sustainability profiles, while on the other hand, unlocking lower financing costs for renewable generators. In addition, utilities are becoming increasingly active in the renewable market. They co-invest in renewable energy projects and/or contract large quantities of renewable electricity and sell this on to their customers. These structures provide the utilities with the economic certainty to keep re-investing in new renewable energy projects.

In terms of the PPAs concluded in the Netherlands, the most well-known PPAs in 2024 are:

- Ecowende (a joint venture of Shell, Eneco and Chubu) has concluded several PPAs for its wind farm Hollandse Kust (west) lot VI, namely with:
  - LyondellBasell for a period of 15 years from 2027 and amounting to approx. 103 GWh per year;
  - Plukon and De Heus, with the support of PPAssurance (see above);
  - Google for approx. 478 MW production capacity (this PPA relates to two wind farms, namely Hollandse Kust (west) VI and Hollandse Kust (noord) V (which is commissioned by Crosswind, a joint-venture between Eneco and Shell));
  - Albert Heijn (a large supermarket chain).

- KPN has concluded a PPA with Eneco to purchase electricity from solar farm Kabeljouwbeek for a period of 15 years from 2025 and amounting to approx. 47 GWh per year;
- Urenco has concluded a PPA with PZEM to purchase electricity from the Borssele nuclear power plant for a period of 6 years from 2027 and amounting to approx. 175 GWh per year. This is the first PPA signed for the plant;
- Fastned has concluded a PPA with GLP Clean Energy to purchase electricity amounting to approx. 15 GWh per year from its rooftop PV system on its distribution centre in Zevenaar. This PPA expires in 2031.

# Norway

Whilst recent decades have seen a resurgence in the use of Corporate PPAs in Norway, recent market conditions and fewer renewable energy projects have led to a slight decline in the number of PPAs being finalised.



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Government-regulated PPAs have traditionally been an important instrument in attracting power-intensive industry to Norway, such as metal, wood and chemical industries. Today, most of the energy trading in Norway occurs at spot prices through the well-established Nordic power exchange, Nord Pool.

In recent decades, however, there has been a substantial increase in the use of PPAs in Norway, particularly in connection with financing of onshore wind projects. In recent years, we have experienced a slight decline in the number of concluded PPAs due to market conditions and few new renewable projects having reached financial close.

Norway is part of a common Nordic power market with Sweden, Denmark and Finland, which in turn is integrated into the European power market via grid connections to the Netherlands, Germany, the Baltics, and Poland. In 2021, NordLink, a 623 km interconnector between Norway and Germany, was implemented, and in 2022, the North Sea Link was put into operation, a 720 km interconnector between Norway and the UK.

## The regulatory environment in Norway

There is no standardised contractual framework universally adopted in the Norwegian PPA-market. Instead, it is common for larger entities to employ their own standards as a basis for individual negotiations when structuring PPAs.

This means that most PPAs are concluded on a tailor-made basis. To a certain extent, we do see FEMA-based frameworks used in the Norwegian market as well.

The Norwegian energy market is fully deregulated and there are no particular laws or regulations surrounding the entering into of private PPAs, other than a requirement that any wholesaler of electricity needs an electricity trading license, which is easily obtained by application to the regulator - Norwegian Energy Regulatory Authority (RME). A producer delivering electricity to the grid will need a more extensive set of licenses and approvals.

## PPA growth factors

In 2020, Copenhagen Economics, commissioned by the RME, presented an analysis on the development and use of long-term PPAs in Norway. The report indicates that the increase in the use of PPAs over the last few decades was driven in part by the establishment of data centres in the Nordic region and the financing of onshore wind farms.

In addition, it was also highlighted that increased attention to the energy transition and ESG strategies and, increasingly, legal requirements driven by EU policies which affect availability of capital, have increased the demand for large consumers being able to demonstrate that their energy use is sourced sustainably. This has resulted in a number of PPAs being executed by well-known international corporations such as Google, IKEA and Facebook.

## Electricity certificates and guarantees

Electricity certificates (so-called Elcerts) issued under the Swedish-Norwegian certificate scheme have commonly been sold under PPAs in addition to the electricity. Generally speaking, all new renewable producing facilities that came online in the period from 2012 to 2021 will be allocated one Elcert per MWh of electricity produced, for a period of 15 years from commissioning. Elcerts have also been sold separately under EPAs (Elcert Purchase Agreements), structured similarly to traditional PPAs, although this is more uncommon. Guarantees of Origin (GoO's) issued in accordance with EU regulations are also allocated to Norwegian renewable producers and commonly sold along with electricity under a PPA.

There has been some uncertainty related to the future of the GoO's in Norway as the political platform of the current government contains provisions on removal of the system, but these provisions have to date not been followed up with concrete actions.

### PPAs: challenges and future prospects

The recent decline in PPAs concluded in the Norwegian market has a number of explanations. An extremely volatile spot market has resulted in a gap between supplier and buyer expectations, leading many renewable projects to choose lower hedging ratios in combination with shorter duration, or constructing projects on an all-equity basis, thereby avoiding the banks' price hedging requirements. The processing of onshore wind license applications was also put on hold by the Norwegian government in 2019, leading to a natural decrease of the number of onshore wind projects reaching FID over the last years. Since 2022, new applications are again being processed which is expected to lead to a rise in greenfield onshore wind development in Norway and a further demand for PPAs. In July 2023, the Norwegian Energy Act was amended to prevent the granting of licences for onshore wind

farms until the projects have been approved under the Norwegian Planning and Building Act by the local municipality. This change, often referred to as a local veto, could help put a boost into the development of onshore wind energy again.

### PPAs and offshore wind power developments

It is important to highlight the uncertainty surrounding the use of PPAs in offshore wind power developments in Norway. Offshore wind projects in Norway currently depend on government subsidies, which will be made available through a competitive process for a Contract for Difference (CfD) with the Norwegian State. Under a CfD regime, it is not commercially attractive to enter into a PPA for the term of the CfD (15 years from commissioning) other than a pure route-to-market PPA. Nevertheless, it is anticipated that some offshore wind projects in Norway could be realised without CfDs, meaning that long-term PPAs are likely to be entered into for such projects subject to the requirements of the project finance providers.

# Poland

The market for Corporate PPAs in Poland has been in growth mode for the past eight years.



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To some extent it has now reached maturity and has serious prospects of further development. The pace of these developments will depend on a variety of factors with very important regulatory components.

The significant benefit from investing in Corporate PPAs is one of the drivers of demand for Corporate PPAs among the largest off-takers in Poland. The projected economic results depend on the extreme volatility of electricity prices (which one might have observed over the last few years). The price level remains vital in securing the competitive position of the most energy-intensive industrial off-takers. The latter tend to have the perception of cPPAs as a viable alternative to wholesale market and, at the same time, seek to secure more competitive prices with contracts.

Large corporates are beginning to focus more on sustainability initiatives and obligatory non-financial data reporting based on ESG legislation, driving the demand for Corporate PPAs. Advisors are engaging in a number of Corporate PPAs negotiation processes, leading to an increase in expectations of multinational corporations in regard to carbon-footprint reduction methods used by their supply chain contractors (which often recognise the higher value of Corporate PPAs as an energy transformation tool compared to less ambitious solutions such as unbundled guarantees of origin.

Bankable Corporate PPAs, alongside credible corporate off-takers are also attractive to owners of renewable power projects. Corporate PPAs ensure stable electricity price over long-term tenures and let the investors secure return on investments (ROI). Considering the significant decline of state aid schemes for renewable power sources, especially the auctioning scheme, investors are even more interested in Corporate PPAs & Virtual PPAs as a very good alternative to subsidies. This is because it provides a long-term predictable revenue stream supporting repayment of long-term debt financing.

Such an ideal symmetry between investors and recipients should guarantee dynamic development of the market, proven by the increasing number of new contracts. Further development is, however, moderated by the existing regulatory and administrative barriers, among others:

1. The so-called 10H rule introduced by the Act of May 20, 2016, prohibiting construction of onshore wind power plants in a distance shorter than ten times the height of such a plant (measured from ground level to the highest point of the structure) from the nearest residential buildings, which effectively blocked the possibility to develop renewable power sources on almost the whole territory

of Poland for years. Even though the '10H rule' has been relaxed under the provisions of the Act of March 9, 2023, the newly defined minimum distance from the wind turbines to the nearest residential buildings (of at least 700 meters) requires further consideration which is currently debated at political and lawmaking level with a view to forthcoming changes in the nearest future;

2. Recently implemented provisions regarding direct line / private wire provided for public overheads, which are to be paid by off-takers for each MWh of electricity delivered by direct line in Poland; the total amount of such overheads is higher than anywhere else in the EU. Self-generation and as-a-service / lease-based models remain unregulated and widely used, whereas the on-site cPPAs based on direct line are rare;
3. Very limited system flexibility and scarce connection capacities, resulting in numbers of refusals to issue grid connection conditions for new RES installations, increasing frequency of non-market redispatching and curtailments.

The number of agreements concluded in the coming years may be positively influenced by factors such as, above all, the development of renewable fuels of non-biological origin sector. Taking into account respective provisions of RED III and implementing regulations, in Poland the use of electricity sourced based on PPAs will, in principle, be a prerequisite for the recognition of hydrogen as renewable or green, as well as the recent EU Electricity Market Design reform, enabling Member States to use a wide range of instruments aimed at reducing counterparty risk and lowering access barriers to the Corporate PPAs market for recipients other than the largest corporations.

It appears that Corporate PPAs may also be applicable to off-shore and nuclear investments, but both subsectors are at an early stage of development at this point and it is difficult to predict the future market trend.

Poland has advanced in the EY RECAI ranking to the top European countries in terms of attractiveness on the cPPA contract market (from 10<sup>th</sup> to 7<sup>th</sup> place), and currently the Polish market is the largest in this respect in all the Central and Eastern Europe.

# Portugal

2023 was a historic year in terms of growth of installed solar capacity in Portugal, with expectations for the country's renewable energy market remaining extremely high.

This is thanks to the current government's total commitment to the sector and the planned allocation of European funds to the climate transition. This, along with the decrease of energy prices on the Iberian wholesale market, gives rise to equally elevated expectations regarding the Corporate PPA market in Portugal.

## A historical Commitment to renewable energy

Portugal has been consistently supportive of renewable energy generation, especially through encouraging legal regimes that have guaranteed and protected investment in renewable energies.

The approval of the National Energy and Climate Plan 2021–2030 ("PNEC 2030") and the National Strategy for Hydrogen have reaffirmed Portugal's commitment in promoting the reduction of greenhouse gas emissions, the incorporation of energy from renewable sources and energy efficiency, the decarbonisation of society and the promotion of the gradual introduction of hydrogen. More recently, the PNEC 2030 was subject to a revision (which was submitted for public consultation last month - July 2024) which sets even more ambitious targets for reducing greenhouse gas emissions and increasing the share of renewable energies than the first version of the PNEC 2030.

The government's ambition is to reach the end of the decade with 85% of the energy consumed coming from renewable sources, outlining a clear path to achieving climate neutrality by 2045.

In addition, due to the recent severe impacts of the pandemic that created new challenges for the climate transition, Portugal has allocated around 38% of the available funds under the national recovery instrument based on the Next Generation EU program, to the climate transition.

## Electricity production

Electricity production in renewable energy plants registered in Portugal until 7 November 2012, is promoted through a feed-in tariff. Since then, no guaranteed remuneration scheme has been approved for new projects in Portugal, other than for small-scale, self-consumption or renewable cogeneration projects.

## Main drivers of the Portuguese Corporate PPA market

### The Rise of Solar Power

A few years ago, a rampant interest in the deployment of solar energy in Portugal emerged. This is mainly due to the fact that Portugal is one of the countries in Europe with the best conditions for harnessing this resource, given the high average annual number of hours of sunshine.

While most renewable investment in Portugal had traditionally focused on the wind and hydro sectors, leaving solar energy overlooked, we have recently witnessed a significant increase in capacity licensing requests for solar energy projects. 2023 saw a new record in the installation of solar photovoltaic capacity in Portugal, with more than 1053 megawatts (MW) of new power added in the first eleven months of the year.

### The Solar Auction Initiative

In 2019, the Portuguese Government launched an auction to grant grid capacity. Each participant submitted proposals to benefit from a guaranteed remuneration (feed-in tariff) or to trade electricity under market conditions, against the payment of a contribution to the National Electricity System (SEN). Both remuneration schemes would be in place for a period of 15 years.

Due to the success of such auction, photovoltaic production has exceeded the annual mark for the first time, with 1,400MW allocated and a world record of €14.80 per MWh reached. The 2020 solar auction proved a success with Portugal breaking a new world record with the lowest price of solar energy recorded.



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Following the success of these two auctions, the Portuguese Government decided to launch a new initiative in 2022, which consisted of a floating solar auction aimed at attributing reserve capacity to be leveraged by power plants to be installed in Portuguese dams. This auction had two lots achieving the lowest tariffs in the world: €41.03/MWh and – €4.13/MWh (equivalent to a 110% discount to the reference tariff initially set), which is about 137% lower than the lowest tariff obtained in the previously mentioned 2020 solar auction, at the time considered to be the lowest in the world.

### Current Strategy

According to the PNEC 2030, Portugal's strategy in the short term will involve the launch of auctions for the production of electricity from solar and offshore wind for the allocation of new renewable capacity, including dispatchability, drawing on the success and experience of auctions that have already taken place.

According to the same instrument, in onshore wind energy, the focus will be mainly on hybridisation, over-equipping and retrofiting.

These are three ways of increasing electricity production from renewable sources while minimising the impact on consumers and the environment and which were recently regulated by the legal regime applicable to the SEN approved by the Decree-Law 15/2022 of 24 January.

Another of the Portuguese government's endeavours to boost the development of renewable projects will be in electricity storage systems. As part of the national recovery instrument, the government launched a €99,750,000.00 incentive system for companies in July 2024. It aims to support investment in the installation of storage systems for electricity produced from renewable sources with at least 500 MW of energy storage capacity in the electricity grid, the implementation of which must be completed by 31 December 2025.

Finally, the government is also focused on promoting renewable gases, with plans to implement a set of mechanisms in the short term that aim to:

1. regulate the injection of renewable gases into the national natural gas network;
2. implement a system of guarantees of origin for renewable gases;

3. concentrate the financial resources available in national and European funds to support energy production in the production of renewable gases, in particular renewable hydrogen and biomethane.

### Main challenges for the corporate PPA market in Portugal

The main challenges to the development of renewable energy projects in Portugal and to the Corporate PPA market concern the complexity and slow pace of licensing procedures of the projects. Associated with excessive bureaucracy, a lack of coordination between different regulatory bodies and a shortage of specialised human resources, as well as the lack of capacity in the electrical grid to receive the total volume of energy produced and the consequent need for new grid expansion projects with significant territorial expression.

However, given the high growth potential of the renewable energy market in Portugal and the current government's commitment to the sector, mechanisms are already in place to overcome such challenges.

### Recent Corporate PPA's in Portugal

The new reality of operating without a feed-in tariff is challenging, given that all projects in Portugal are being licenced under a subsidy-free scheme and renewable energy generators are now faced with energy trading under organised markets.

With the decreasing power prices on the Iberian wholesale market registered in the first quarter of 2024, along with the intensification of companies' corporate sustainability reporting obligations under the Corporate Sustainability Reporting Directive, stakeholders point to the use of Corporate PPAs as a solution for the bankability of projects.

However, Corporate PPAs in Portugal do not have a specific legal regime and are therefore governed by the general regime for the production and commercialisation of electricity under the SEN and by general contract law.

Some examples of players in the Portuguese Corporate PPA market are:

- Sakthi, which has been awarded an 18-year contract for the supply of renewable energy by EDP, being the largest ever PPA signed in Portugal by the EDP group;
- Exus and Blackrock (with Axpo);
- Allianz Capital Partners (with WeLink);
- BA Glass Group (with Voltalia);
- Vodafone has also recently signed a PPA with Iberdrola, which will supply the first 410 GWh of photovoltaic (PV) solar energy per year in Germany, Portugal, and Spain. More recently, Equinix signed a 10-year contract with Sonnedix, starting in July 2025, to supply renewable energy produced by Sonnedix's first project in Portugal (149 MW), the company's largest solar plant in Europe to date; Finally, Vidrala, a leading company in the design and manufacture of glass containers, has signed a PPA with ACCIONA Energía for the supply of renewable energy that will cover between 20% and 25% of the company's electricity needs over the next ten years.

The contract will come into effect in January 2025 and will allow Vidrala to source clean electricity for its operations at several manufacturing plants, including Marinha Grande (Portugal).

### Outlook for the future

With 2023 being a historic year in terms of renewable energy production, and particularly regarding solar energy (whose contribution increased by 43%), the outlook is that the next few years will see very positive developments for the Portuguese market.

We will see continued investment in solar energy and the further expansion of retrofitting, over-equipping, and hybridisation solutions, as well as the installation of storage systems such as Battery Energy Storage Systems, which will all be supported by the incentive policies already announced by the government.

In this context, 2024 looks like a promising year with high potential for the Corporate PPA market, as stakeholders see it as a way of ensuring the bankability of projects.

# Romania

Corporate PPAs present significant opportunities, as new projects advance into the Ready-to-Build (RTB) phase.

## PPA ban in Romania

Since 2007, Romania’s electricity market has become increasingly liberalised. However, further to the signing of several detrimental long-term electricity sale agreement, by a state-owned producer, Romania’s State banned all electricity producers from entering into directly negotiated electricity sale agreements. The PPA ban was in force for almost ten years and within this period the electricity produced in Romania has been sold solely on the centralised markets administered by the Romanian Operator of the electricity and natural gas market, “Opcom S.A.” As of March 2023, the Romanian Commodities Exchange also obtained a license for the administration of a wholesale centralised market.

## 2020: A new development phase for Romania’s electricity market

In early 2020, Romania’s electricity market entered a new phase of development, in line with the country’s commitment to reach a RES 2030 target of 30.7% (to be potentially increased to 34%). From December 31, 2021, the ban on PPAs was lifted. The Energy Law no. 123/2012 was also amended to enable developers to sell, during the construction phase, the electricity that will be produced by the generation facilities, despite not having a generation license at the date of signing of the PPA.

As per the law, the generation license should be obtained no later than 60 days prior to the start of delivery otherwise the PPA will be terminated further to the default of the developer.

Although the lift of the PPAs ban removed one of the main hurdles preventing investments in new renewable projects, a limited but slowly increasing number of large PPAs have been entered into to date.

## Recent examples of PPAs in Romania

Recent examples of PPAs entered during the second phase of renewables include:

- the virtual PPA entered between Ursus Breweries and Energy
- the physical PPA entered between Verbund, Axpo and a multinational automotive supplier
- the virtual PPA entered between Orange and Engie;
- the virtual PPA entered between Bekaert and Rezolv Energy;
- the on-site corporate PPA entered into by NextE with a final consumer.

## Romania’s funding progressing in the right direction

With more renewable projects advancing into the Ready-to-Build (RTB) phase and developers pursuing financial support from credit institutions, this year registered a slight an increase in the number of PPAs.

Recently, after repeated delays, significant progress has been made with the publication of the main rules for the first two Contracts for Difference (“CfD”) auctions to be organised in 2024 and 2025. The CfD scheme will consist of operational aid granted to solar and on-shore wind producers.

Although the CfD mechanism was feared to lead to the decline of the PPAs, the recent decrease of the maximum strike price compared to the figures approved by the European Commission (namely EUR 82/MWh for onshore wind, respectively EUR 78/MWh for solar), and the fact that at least for the 2024 auction the applicants will have to prove experience in similar projects, it may not be as detrimental for the PPAs market as initially thought. We are eagerly waiting for the responses from both developers and lenders on the viability of the mechanism considering the rather controversial items mentioned above.



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## Additional taxes & sanctions to be repealed by end of March 2025

The well-known legislative pack adopted to lessen the impact of the high energy prices caused by the Russian aggression against Ukraine which introduced additional taxes on the trader's revenues has not been prolonged and so the measures are expected to cease as of 1 April 2025. Moreover, due to the prices decreased seen this year, the windfall tax has been adjusted as follows:

- 1. Windfall tax on revenues:** the traders' profit rate has been increased from 2% to 10%. The tax is now due on revenues deriving from the resale of electricity purchased by means of physical PPAs if the trading price is higher than the monthly average acquisition price plus 10%, including for export.
- 2. Windfall tax for financial PPAs:** the reference price for determining the price has been decreased from RON 450 to RON 400. The tax applies if the variable price is higher than RON 400/MWh and is also relevant to the partners from back-to-back hedging agreements.

The same legislation also sanctions the "successive sale" of electricity carried out by the traders with the clear aim to increase the price with a fine up to 5% of the trader's turnover. The sanctions are also limited in time until March 2025.

## Other challenges to Corporate PPAs: offtakers & penalties

Although credit institutions have shown a preference towards corporate PPAs, developers still claim they face some difficulties in finding credit-worthy offtakers that the credit institutions accept. In addition, similar to other EU countries, Romania transposed and further detailed the EU legislation on supplier's switching. This legislation grants the corporate client the right to terminate any supply agreement at any point in time.

Termination penalties can be enforced by the developer/producer, provided they satisfy the conditions imposed by Romanian law. Among these conditions we note that the penalty cannot exceed the amount of the producer's direct economic losses caused by the customer further to the early termination of the contract.

Whilst corporate PPAs are beneficial in protecting against price strike, end-consumers are still hesitant about committing to a long-term, predetermined price. Especially given the volatility and alleged abuses of electricity prices by suppliers which some end-consumers have reportedly witnessed over the last couple of years. However, Romania's corporates also start to commit to sustainability initiatives, notably towards achieving net zero and Economic Social Governance (ESG) strategies.

## Looking ahead: a brighter future for Romania's Corporate PPA landscape

On a more positive note, Romania was included in the top 30 Corporate Power Purchase Agreement (PPA) index published by EY. Furthermore, Romania's Government is currently making efforts to join the Association of Issuing Bodies (AIB) and to update the legal regime of the guarantees of origin (GOOs), which would facilitate the trading of GOOs issued in Romania abroad.

# Serbia

Strong indications that the demand for corporate PPAs will continue to rise and that the market will witness an increase in projects relying on the corporate PPA mechanism.



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While the Serbian corporate PPA market is not yet as advanced as the highly developed European ones, the need for wider implementation of corporate PPAs has been recognised by legislative and market players – not only by the commercial buyers, producers and sellers of electric energy, but also by financing institutions.

## The evolution of corporate PPAs in Serbia: regulatory landscape and delay factors

The introduction of the Law on Use of Renewable Energy Sources (RES Law) in 2021 (amended in 2023) established the concept of corporate PPAs in the Serbian legal framework and initially generated high expectations and market buzz. However, the implementation of corporate PPAs in practice has been drastically slower than anticipated, due to several factors.

For investors, delay was caused by the standstill in the process of connecting renewable energy projects to the electricity grid. The standstill lasted over two years (ending in November 2023), affecting a large number of projects and increasing the uncertainty of project development.

Another cause for delay has been the continuous postponement of auctions for market premiums, which led to investor uncertainty on how to structure the future offtake of produced electric energy; many investors waited to see how the first auctions would evolve before making decisions.

For buyers, the delay is predominantly caused by the apparent lack of knowledge and understanding of the PPA mechanism. Local companies appear to have been unfamiliar with corporate PPAs as an option for meeting their energy needs. For years, they have relied on the state-owned supplier, EPS, which remains the dominant player in the market. Alternatively, companies may have been deterred by the inherent complexity of the PPA mechanism.

Recently proposed amendments to the Serbian Energy Law clarify the distinction between physical and financial corporate PPAs. The law is currently open to public debate until the 10th of September 2024, with adoption expected around the 15th of October 2024. The distinction is based on whether the electric energy is physically delivered to the end buyer (in case of physical PPAs) or if the flow is purely financial and serves as means to hedge the risk of fluctuating prices of electric energy (in case of financial PPAs).

## The benefits of corporate PPAs to all stakeholders: outlook for the future

Regardless of whether they are physical or financial, private corporate PPAs, being bilateral agreements between private parties, offer significant flexibility. Despite being complex and full of technical details, these contracts can be tailored to meet the specific needs of both parties involved. This contrasts with agreements made with state-owned suppliers or those under government incentive schemes, which follow prescribed models and offer little to no room for negotiating terms.

Companies, especially big industrial players, now recognise that remaining passive when it comes to electric energy consumption is not viable for their businesses. They understand the importance of actively securing a reliable supply of electricity at steady prices to ensure their long-term operational stability. Beyond the need for a stable energy supply, companies are also feeling pressure to adopt environmentally friendly practices. This pressure comes from their CSR commitments, goals related to environmental preservation, as well as marketing and reputation considerations. As a result, they are increasingly opting for green energy solutions.

When it comes to producers of electric energy (i.e. investors), they also seem to realise that both corporate and commercial PPAs are crucial tools for ensuring a steady and predictable income from their energy projects. This predictability makes their projects more attractive, thus boosting the bankability prospects of these projects (at least for a certain amount of output).

This is because:

1. selling electricity exclusively on the power exchange without first hedging against price fluctuations is not only risky but also typically not considered bankable by financial institutions
2. the current state incentive scheme has a limited quota for awarding market premiums to wind and solar power plants—1.3 GW in total (of which about 425 MW has already been allocated in the first auctions). This quota is insufficient compared to the expected capacity of new power plants under development, meaning investors will likely need to use private PPA mechanisms to secure their offtake.

Finally, commercial banks, aware of Serbia's green goals to increase the electricity production from renewable energy sources – along with the expected surge in new projects – acknowledge that it is highly unlikely that all these projects will be self-financed by the investors. Recognising their crucial role in financing these projects, banks understand that they must adapt. Although the traditional model for financing renewable energy projects was based on feed-in-tariffs which banks grew accustomed to, they have now accepted the new reality and are willing to explore different directions and adapt to new mechanisms. We are already seeing banks financing projects which have been awarded market premiums, and the first project financings based on commercial PPAs have emerged. This progression indicates that financings based on corporate PPAs with reliable and creditworthy offtakers is the logical next step.

# Singapore

Singapore Green Plan 2030 charts ambitious and concrete targets to advance Singapore's national agenda on sustainable development.



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## Singapore Green Plan 2030

In October 2022, Singapore announced that it would raise its national climate target to achieve net zero emissions by 2050 as part of its Long-Term Low-Emissions Development Strategy (LEDS). Singapore will also reduce emissions to around 60 metric tons of carbon dioxide equivalent (MTCO<sub>2e</sub>) in 2030 after peaking emissions, as part of its revised 2030 Nationally Determined Contribution (NDC).

## Achieving net-zero: the demand for Corporate PPAs

To achieve net-zero emissions by 2050, Singapore's electricity supply mix will need to evolve over the coming decades towards the "four switches" of natural gas, solar power, regional power grids and electricity imports, and low-carbon alternatives. The Government will work with companies, researchers, and the public to deploy at least 2 GWp of solar by 2030 – enough to meet the annual power needs of around 350,000 households in Singapore or around 3% of Singapore's 2030 projected electricity demand. As of January 2024, Singapore is more than halfway to its solar power deployment target.

Heavy energy users, such as data centre operators, have sought government support as the consumer demand for green energy has surged whilst the local supply of green power purchase agreements remain in limited supply.

## Types of Corporate PPAs: Onsite & Offsite

The corporates and industries in Singapore favour precise contracting frameworks for green energy, driven by financial, regulatory and sustainability objectives. There are mainly two types of corporate PPAs in the market: onsite PPA and offsite PPA.

### Onsite PPA

The onsite PPA is currently the most prevalent contracting model in Singapore. Smaller projects are sometimes referred to as "behind the meter" PPAs as the solar energy is produced and consumed onsite in a private distribution agreement, separate from the national grid, without going through a meter. In terms of the documentation, the major areas of contention typically centre on the termination rights and termination payments, curtailment scenarios, and in some cases, the ownership of the green attributes (including renewable energy certificates or RECs).

There are also options for excess power to be sold to the national grid. The energy regulator (EMA) has helpfully simplified the regulations for a consumer to sell excess solar generated electricity back to the national grid.

### Offsite PPA

The offsite PPA is nowadays referred to as a virtual (VPPA). This can be rather confusing as VPPAs are also used for demand management curtailment, or used interchangeably with corporate PPAs.

In VPPAs, no physical energy exchange is involved, and the VPPA only documents a financial transaction. Typically, there is a contract for difference between the fluctuating spot price and the VPPA's predetermined strike price, thereby providing a hedge against future spot price fluctuations.

In addition, all Renewable Energy Certificates (RECs) and other environment attributes accruing from the green power generation passes to the buyer. RECS lower the buyer's gross market-based Scope 2 emissions from purchased electricity and entitle the buyer to claim its use of renewable electricity from a low or zero emissions source.

The offsite PPA is typically more complex than the onsite PPA. There are no standard contracting terms and many of the commercial arrangements are variable and designed to suit the consumer's specific needs. The negotiations for an offsite PPA usually centre around the stability of the green power supply and the consequences of any shortfall in supply as well as the need for valid creation, registration and transfer of RECS and green attributes to the buyer. Obviously, in this case, metering is also key as the buyer pays based on metered injection into the grid, and many buyers require audits and contractual mechanisms to deal with metering inaccuracies. Termination rights and termination payments are also highly negotiated in most offsite PPAs.

### Power import projects

Power import projects, where renewable power is produced offshore (e.g. Malaysia and Indonesia) and transmitted to Singapore via subsea cables, have spurred a healthy growth of VPPAs in Singapore.

The force majeure and change of law provisions in such VPPAs are usually highly negotiated as power import projects are susceptible to foreign law and operational risks.

### The power of the sun

Singapore is one of the most solar-dense cities in the world today. Presently, Singapore has a solar capacity of around 1.2GWp as at the first quarter of 2024. That is more than the three-quarter mark to meet Singapore's 2025 target of 1.5GWp. There is also a whole government approach to systematically aggregate the renewable energy needs of all public agencies and to regularly put this out to the market on PPA tender, thereby creating a vibrant and enticing market for independent power producers.



# Slovakia

Market liberalisation and general support for more free market mechanisms have cleared the way for more renewable energy sources in Slovakia, and the interest in Corporate PPAs across businesses continues to increase.



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## State subsidies

The electricity from renewable energy sources (RES) in Slovakia has been promoted to RES producers through a system of state subsidies. Since 2019, the state subsidy system changed from the system of feed-in tariff (FIT) to a feed-in premium (FIP) following a successful auction. The authority, the Electricity Market Operator - OKTE, plays a key role in terms of the provision of the subsidies.

The state provides the FIP subsidy to those RES producers chosen in the new auction system, i.e. the producers receive a premium on top of the market price of their electricity production. The smaller RES producers (under 500 kW) still receive a subsidy under the previous system of FIT.

Additionally, the Slovak RES Act provides an option for businesses to operate their own “local RES” under 500 kW for their own use, which is free of (often demanding) fees, e.g. fee for the grid connection, etc.

The Slovak Ministry of Economy is expected to announce a call for applications to support the development of electricity sources, including new renewable electricity sources.

This is primarily an investment to increase the flexibility of electricity systems through subsidies, amongst others, for the construction of hydroelectric storage power plants and battery systems.

One of the important conditions for participation in the auction and purchasing guarantees is to conclude a respective Agreement with OKTE on activities related to the issuance and use of guarantees.

## In summary

To summarise, for several years, Slovak RES producers have been mostly selling the electricity to the grid and the distribution system. The option of selling directly to the specific electricity buyer using a Corporate PPA has not been widely used in practice.

Nonetheless, the system of non-subsidy RES projects and the Corporate PPA option has recently become a widely discussed topic in Slovakia. Corporate PPAs are increasingly starting to be seen as an interesting alternative to selling directly to the distribution system, and participating in state auctions.

Corporate PPAs are regulated by Slovak law with a greater level of detail. In practice, this leads to several unanswered regulatory questions, however, it should not lead to the prohibition of Corporate PPA in general.

The gaps in the regulation need to be addressed with more detailed and precise drafts of PPA agreements, whilst keeping in mind the local existing regulatory environment. This includes not only the applicable statutory laws, but also another factor: namely that the Distribution system operators may play a role in this matter (including application of their own binding rules on the operation).

In conclusion, the liberalisation and general support of more free market mechanisms have cleared the way for RES in Slovakia for the years ahead, but Corporate PPAs are yet to be regulated. Given the increasing interest in Corporate PPAs amongst businesses, it's very likely that Corporate PPAs will be supported and legally regulated in the next couple of years.

# Spain

The Spanish PPA market remains extremely active.



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## Spain's leadership in the European PPA market: continued dominance

In 2023, Spain maintained its position as the leading country in the European PPA market for the fifth consecutive year. The country reached a total of 4.67 GW in 37 deals, driven mainly by solar, which is regaining its dominance, and with only 260 MW attributed to onshore wind. The profile of corporate buyers remained unchanged from the previous year, with IT conglomerates maintaining market leadership in 2023 and 2024. Consumer staples also maintained their leading position in terms of number of deals. However, it is worth noting that while IT conglomerates are the main drivers of the PPA market, a more diverse range of corporate profiles is emerging and entering the PPA market in response to their need to meet ESG criteria. This diversification is increasing healthy competition and improving liquidity for buyers in the market<sup>26</sup>.

## PPA price volatility

Spanish PPA prices have been subject to significant fluctuations and volatility, influenced by the various global geopolitical conflicts (i.e. mainly the Ukraine-Russia war, and conflict in the Middle East) that have had a direct impact on energy prices in Spain. These fluctuations

have affected Spanish PPA prices, which rose during 2023 and have fallen in the first half of 2024, reaching low-lying levels and jeopardising the viability of many renewable projects. This fall has been due, among other factors, to the cannibalisation of prices, the penetration of renewables and, consequently, an excess supply that is not being matched by the same level of demand.

In Spain, after several months of declining solar PPA prices, prices stabilised during the second quarter. Despite this stabilisation, the high cannibalisation of solar energy prices has led to extremely low spot prices in Spain. These low prices pose a risk to the viability of projects, as developers face difficulties in recovering development costs and meeting the necessary profit margins to justify their investments.

## Market dynamics

### Negotiation Shifts

In recent years, PPAs have been negotiated at varying price levels, reflecting different costs and market tensions. These negotiations have always aimed to generate value for both parties. However, the current corporate PPA market has shifted, with buyers now holding more influence due to persistent negative spot market prices.

This makes buyers less motivated to sign PPAs compared to previous years (for example, when gas prices soared following the Ukraine-Russia war). As a result, sellers are now more constrained in imposing their conditions and prices, although they need more than ever to get PPAs signed to achieve medium and long-term revenue stability to raise external financing.

## Regulatory changes

### New regulations to unblock the bottlenecks brought by the Royal Decree-Law 23/2020:

Royal Decree-Law 23/2020, issued on 23 June, approving energy and other measures for economic reactivation (the "Royal Decree-Law 23/2020") introduced new requirements for renewable energy generation facilities. To maintain access and connection permits to the electricity grids, these facilities must meet specific administrative milestones. If developers fail to meet these milestones, the financial guarantees they have deposited may be forfeited.

Pursuant to Article 185 of Royal Decree-Law 5/2023, issued on 28 June, which adopts and extends certain measures in response to the economic and social impacts of the War in Ukraine, supports the reconstruction of the

<sup>26</sup> Source: European PPA Market Outlook 2024

island of La Palma and other situations of vulnerability; as well as transposes European Union Directives (the “Royal Decree-Law 5/2023”), the maximum period for meeting the milestone related to administrative authorisation for construction is set at 43 months for facilities that obtained access permits between 31 December 2017 and before 3 June 2023.

However, by means of a new Royal Decree-Law enacted in extremis - Royal Decree-Law 8/2023 of 27 December, which adopts measures to address the economic and social consequences of the conflicts in Ukraine and the Middle East, as well as to alleviate the effects of the drought (the “Royal Decree-Law 8/2023”) - a new extension was granted. This extends the period from 43 months, as established by Royal Decree-Law 5/2023, to 49 months, allowing more time to achieve the milestone of obtaining administrative authorisation for construction for those facilities that had obtained access and connection permits between 31 December 2017, and the entry into force of Royal Decree-law 8/2023 on 29 December 2023.

Another of the measures introduced by Royal Decree-Law 8/2023 was to allow developers who had obtained access and connection permits in the aforementioned period (i.e., between 31

December 2017 and the entry into force of Royal Decree-Law 8/2023) to extend the deadline for obtaining the definitive administrative authorisation for operation by up to eight years, provided that the following conditions are met:

1. said extension shall be requested within three months from the entry into force of Royal Decree-Law 8/2023 or from the date of obtaining the administrative authorisation for construction, whichever is later;
2. this extension shall expressly include the six-month period of the calendar year in which the facility will obtain the administrative operating authorisation, which must in any case be within the maximum period of eight years indicated;
3. the Administration shall issue a decision within a period not exceeding six months, and failure to do so shall have the effect of rejecting the application; and
4. the setting of this new deadline prevents the activity from starting up prior to the beginning of the six-month period.

## Outlook for the future and strategic opportunities for PPAs: market dynamics

### The rise of data centres in Spain – an opportunity for PPAs and price cannibalisation mitigation

As mentioned above, the Spanish electricity market is experiencing a new reality with significant implications for PPAs. For the first time, Spain recorded negative prices in the spot market during the second quarter of 2024, particularly in March and May. This was due to a substantial increase in renewable energy production, driven by solar PV and hydroelectric power. The Spanish government’s ambition regarding renewable energy policy targets, the penetration of renewables, high solar cannibalisation and insufficient storage capacity to cope with the above situations, are likely to make these negative price situations more frequent. As a result, it is expected that in the coming months we will see PPAs incorporate more innovative pricing schemes and flexibility clauses to adapt to these extremely low prices and remain bankable.

In this context, data centres are emerging as a crucial alternative for securing financing for renewable projects. They provide an outlet for a renewable energy market that generates more energy than current demand, with supply expected to grow exponentially by 2030, according to the National Integrated Energy and Climate Plan (PNIEC). The consolidation of the data centre sector and its commitment to green energy through PPAs could play a key role in mitigating the price cannibalisation caused by the penetration of renewables (predominantly solar) in a market facing a lack of demand. In this regard, several recent PPAs in the Spanish market illustrate the successful growth of the PPA market in the booming data centre industry. Notable examples include Apple and Ib Vogt (105 MW), Repsol and Microsoft (230 MW), Equinix and Ignis (225 MW), Digital Realty and BRUC (five PPAs covering around 347 GWh), and Amazon and Grenergy (469 MW)

Despite this growth, Spain's journey to becoming a leader in the data centre market faces challenges, particularly in developing energy transport network infrastructures. Spanish data centre associations have expressed concerns about the current state of these infrastructures.

In response, the Spanish government is considering revising the limits on network investment. In June, a public consultation was launched, proposing measures such as increasing investment in distribution and transmission networks, raising the maximum investment volume as a percentage of GDP, modifying conditions for increasing investment volume, and establishing a new procedure for authorising investments above the current maximum volume.

#### **Short-term and Long-term PPAs**

The renewable energy market in Spain is increasingly adopting a balanced approach to managing revenues through a combination of short-term (ST) and long-term (LT) PPAs. This strategy aims to optimise financial stability and flexibility. While 3-year PPAs are increasingly common for projects that are still in the development phase, 1-5 year PPAs continue to prevail for existing assets. This trend indicates a shift towards more adaptive and responsive contracting strategies in response to price fluctuations in the spot market.

#### **Multi-buyer PPA**

Multi-buyer PPAs emerged as a notable new trend during 2014. By sharing risk, it could be a new avenue for smaller companies to jointly acquire renewable energy through PPAs.

#### **Energy mix and storage**

2023 also saw the first PPAs combining electricity and storage, and the first PPAs for green hydrogen production, which is expected to become a trend in the coming years as storage takes off.

#### **Tripartite PPAs**

In addition, the rise of tripartite PPA structures is increasingly becoming a reality in the market, reflecting the evolving role of utilities in the PPA market. Project owners, utilities and corporations are joining forces - leveraging each of their individual strengths and competencies to conquer the PPA market.

This has led to successive PPA agreements, where utilities/traders mitigate project risks and manage them through long-term volume sales to companies. Utilities have also become more active as risk managers, positioning themselves as 'market integrators' and facilitating the signing of individual physical PPAs.

# Sweden

Corporate PPAs have been used for some time in Sweden and continue to grow for solar and onshore wind, further advancing an already appealing market.



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### Corporate PPAs in the Swedish Energy Market

Corporate PPAs in the Swedish energy market should be viewed in the context of the integration of the energy market with neighbours in the Nordics, and an increased demand and willingness to enter long-term Corporate PPAs in recent years. In particular, the integrated Nordic whole-sale energy market, Nord Pool, and the Swedish and Norwegian support scheme for renewable energy, are important to understand the current Swedish PPA energy market.

Following the background of the integrated whole-sale energy market and the Swedish and Norwegian support scheme, the following discussion will involve recent developments and current trends, before looking towards the future of the Swedish energy market.

### Integrated Markets & Cheapest Average Prices for Wind PPAs in Europe

Nord Pool facilitates price visibility and cross border sale of power between Sweden and the other Nordic countries. Sweden has had PPAs in place for many years, however, more recently, large corporates are entering into Corporate PPAs where they are buying power directly from the renewable energy generator.

There are also more long-term Corporate PPAs being entered into in the Swedish market, and large-scale renewable production facilities within wind and solar are increasingly common.

### The Certificate System

The Swedish electricity certificate system has been in place since 2003. Building on the Swedish certificate system, in January 2012, Sweden and Norway developed a joint support scheme for renewable energy with the intention of increasing the production of renewable electricity and to make the production more cost-efficient. The scheme has had a positive effect on renewable energy production in the two countries, reaching its goals already in March 2021. In 2020, the Swedish government decided that plants commissioned after 31 December 2021 would not be eligible for electricity certificates, making all future plants non-eligible. At the same time the Swedish government decided to close the certificate system by the end of 2035, ten years prior to the initial end date.

As the certificate system is a market-based system, it does not guarantee the owner of the renewable installation a specific price for the power generated. Given the power generator takes a price risk related to the sale of the electricity from the renewable installation, and as there may be a continued surplus of power production, corporate PPAs have been used for

some time in Sweden and continue to grow for solar and onshore wind in particular - further advancing an already appealing market. Many financiers, such as banks, require that the price risk is hedged. One way to hedge the price risk is to sign a long term corporate PPA with an off taker. The PPA may be the enabler of the project and provides a “green” profile to the corporate buyer. While they are interested in having a predictable price for their energy over a longer period, many corporates also want to show that they are acting sustainably and are contributing to put additional renewable capacity onto the electricity system.

### Recent Developments & Current Trends

In recent years more long term corporate PPAs have been entered into in the Swedish market. Large corporations such as IKEA, Google, Facebook, Amazon, Volvo and H&M have all signed corporate PPAs, and the trend is increasing.

### Wind Power

Wind power is the third largest energy source in Sweden and is expected to be the most expanded fossil-free energy source in the coming years. Accordingly, we are continuously seeing large corporations entering into wind power PPAs in Sweden.

However, the wind projects are arousing strong local opposition. As wind power grows in Sweden, so does resistance from citizens who are opposing wind farms on the grounds of habitat disruption and spoiled views.

- In late 2019, Amazon and BP announced that they will power Amazon Web Services data centres with 122 MW of onshore wind power based in Västernorrland, Sweden, which is expected to enter commercial operation in 2024.
- In November 2022 it was announced that Microsoft had signed a corporate PPA with energy firm NTR for wind energy in Sweden. Microsoft will draw energy from the 86 MW Norra Vedbo wind project owned by NTR and Reichmuth Infrastructure, which came into commercial operations in Q4 2022. The long-term PPA assists Microsoft in its plans to offset its Sweden data centre region (Sweden Central Azure cloud region) energy consumption with 100% renewable energy.
- In May 2023, Volvo Group and Vattenfall announced that they had signed a long-term corporate PPA under which Volvo Group is purchasing fifty per cent of the renewable electricity produced at Bruzaholm wind park in Jönköping, Sweden.

- In December 2023, it was announced that Equinix, within the scope of its global PPA Programme, had concluded a PPA also in Sweden, making it the fourth PPA it has concluded with Neoen. Under this particular PPA, Neoen will provide Equinix with 15 MW from the onshore wind power project Storbrännkullen, located in Ragunda and Sollefteå, Sweden.

#### Solar Power

Furthermore, there is an increase of solar PPAs in the Swedish market for various industries such as hotels, retailers, and grocery stores as they seek to proactively achieve lower emissions and keep their costs down. However, we have recently seen even more innovative solutions, for instance where solar energy production has been combined with traditional agriculture.

- In 2022, Parks and Resorts, the owner and operator of some of the most popular amusement parks in Sweden entered into a solar PPA with Sweden's leading solar energy company Svea Solar. The solar park Fjällskär located in Nyköping, Sweden, was inaugurated in May 2023 and is expected to generate about 20 GWh per year for powering some of Parks and Resorts amusement parks during the summer months.

- During 2023, two solar PPAs were announced that both claimed to be the largest solar projects in Sweden at the time of the announcements. In June 2023, Alight and the prominent food retailer Axfood announced a corporate PPA and the construction of Sweden's (at the time) largest solar plant with a capacity of 64 MW. A couple of months later, in August 2023, Alight together with Neoen announced that they had signed an even larger PPA with H&M for a facility with a capacity of at least 90 MWp. As record after record is broken for solar PPAs, we are seeing a shift in feasibility of large-scale solar in Sweden.
- Another interesting collaboration was announced in June 2024. Indeed, Europe's largest indoor farm Ljusgårda said that it had entered into a solar PPA with Energi Försäljning Sverige AB and Svea Solar. Together with Ekoväx, Svea Solar is currently building Sweden's largest agri-voltaic solar parc on 13 hectares. The solar park is expected to enter into commercial operation in August 2024 and generate 8 GWh per year.

## The Future of Investments in Renewables

As aforementioned, solar and wind power investments in Sweden have been built at a record pace in recent years, and according to the Swedish Wind Energy Association (SWEA), the electricity certificate system has already reached the 2030 target of 46.4 TWh, almost 10 years in advance. Sweden also saw 21% of total electricity use being produced by wind in 2023, a number that is expected to increase to 26% by 2025 – further showcasing the scale of investments into wind power.

Sweden has a target to achieve 100% fossil-free energy production by 2040 and net zero emissions by 2045. This should be viewed in conjunction with EU-wide goals of 42.5% renewables by 2030. As offshore wind has historically been more expensive, it is mainly onshore wind that has been developed in Sweden. Although production and installed capacity is set to double in the coming years, the number of installed turbines will remain around 5,000 and is expected to peak in 2027. What has been highlighted as a serious obstacle to the development of new wind power is the complicated and uncertain authorisation process that precedes such development.

While the current government has scrapped the proposal of the previous government, which sought to subsidise the cost for grid connections for offshore wind, the government has instead launched an investigation seeking to minimise permitting times for offshore wind.

Subsequently, in March 2024, the government decided to give a supplementary directive to the government inquiry on offshore wind power. The supplementary directive provides that the inquiry shall also take a stand in the question on whether Sweden should eventually switch to a system where licensing for offshore wind power only takes place through the State designating suitable sites for establishment. This investigation is currently ongoing and the results are expected to be presented in November 2024. A development which is in line with EU wide efforts to shorten permitting times for renewable energy sources. Given the recent developments and trends we are seeing, the PPA market is expanding.

# United Kingdom

An established contractual model and safe regulatory environment has made the UK an attractive, albeit comparatively expensive market, for Corporate PPAs.



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## Corporate PPA Market in the UK

The previous UK Government, prior to the July 2024 election, made a series of commitments to renewables which included the Ten Point Plan for a Green Industrial Revolution (November 2020), the Energy White Paper (December 2020), the UK Government's Net Zero Strategy (October 2021), the British Energy Security Strategy (April 2022), the Carbon Reduction Policy (2023) and lastly, the Energy Act (2023) (EA). The EA aims to unlock £100 billion in private investment for energy infrastructure, focussing on renewable generation projects. The EA is encouraging investment in the UK PPA market by enhancing market stability and seeking to provide a more robust regulatory framework. The EA also provides support for the purchase of power on the wholesale market through increased consumer protection and regulation.

The recently elected Labour Government further opened the door to an increase in Corporate PPAs by announcing the immediate removal of the de facto ban on onshore wind projects in place since 2015. The move is part of the new Labour government's plan to double onshore wind energy capacity, treble solar and quadruple offshore wind by 2030.

Furthermore, Labour's 'Green Prosperity Plan' seeks to create 650,000 jobs in the [renewables sector](#) and the government has committed to an 'Energy Independence Act' which will establish a framework for the UK's transition into what the Prime Minister Keir Starmer has called a '[clean energy superpower](#)'. This would suggest a strong outlook for UK PPAs in the years to come.

## Grid Constraints and the new Labour Government

A longstanding issue in the UK PPA market has been the constraints on the national grid system which transports and delivers the UK's electricity. National Grid has been facing a series of challenges with getting its customers connected to the Grid: increasing application volumes; changes in the technology mix (including increased electrification) and diversity of customers adding complexity to the application process and putting a strain on aging infrastructure; and lengthy connection times ([at the time of writing, there are over 500GW of projects seeking connection with many projected connection dates into the mid to late 2030s](#)).

This limits the PPA market as many new generation projects are simply financially unviable as wait times delay projects producing income. To address these challenges, National Grid launched the TMO4+ (also known as 'First Ready, First Connected') process as part of its 5-point grid connection reform plan. TMO4+ aims to prioritise certain connection projects based on specified criteria. UK energy regulator Ofgem published an open letter on 16 September 2024 detailing further changes to the TMO4+ regime, adding that the connection reform process must align with the "strategic planning demands of the GB energy system" ([including the 2030 Clean Power policy and the Strategic Spatial Energy Plan](#)). National Grid have proposed three potential methodologies which are subject to Ofgem approval. One methodology seeks to prioritise projects which: are critical to security of supply or system operability; would materially reduce system/network constraints; are innovative/emerging technologies; or have particularly long lead times. The implementation of TMO4+ is delayed to Q2 2025 to accommodate these changes. The National Energy System Operator (established in October 2024 to oversee and manage the entire energy system in Great Britain)



will play a key role in reforming the connections process, improving connection infrastructure, and strategic network planning that will provide connections for innovative solutions such as energy storage and offshore grids.

### Incentivising Renewable Energy Projects

2024 has been a strong year for the UK Government's Contract for Difference (CfD) auction under which a budget of £1.5bn was allocated across 131 renewables projects. A CfD represents a long-term contract between a low carbon electricity generator and the government-owned Low Carbon Contracts Company. The CfD guarantees a MWh price floor thus incentivising renewables investment and protecting generators from sudden changes in the market.

2023 saw the scheme come under some criticism as the offshore wind industry pushed back against the £44/MWh price floor which industry insiders claim failed to account for the increased development costs under the current market. [This led to no offshore wind bids in the fifth CfD round.](#) 2024 saw a much stronger year for the auction as round six awarded CfDs to projects totalling 9.6GW of clean power across solar, onshore wind, tidal and offshore wind. [This included a record 3.3 GW of solar projects.](#)

The UK government's energy intensive industries support, initially introduced under the previous government and continued under the current, [is expected to be worth around £24-31 per MWh for businesses in industries such as steel, chemicals and cement.](#) This includes a renewable levy exemption and network charging cost compensation which should assist in reducing PPA costs to for such [businesses.](#)

As wholesale energy prices have stabilised in 2024 following a period of high volatility in the early parts of this decade, it is increasingly important for government incentives. Even when considering an uplift for the corresponding REGOs when purchasing wholesale energy, price forecasts tend to put wholesale energy within or below the range for [UK PPAs.](#) We may see this change as the wholesale stability puts downward pressure on UK PPA price negotiations and this has certainly been the case in [Europe where PPA prices declined 5% in Q1 2024.](#)

### Developments and Trends

#### Market Position

The UK now sits in fourth place on [EY's bi-annual PPA attractiveness index.](#) The 14 Corporate PPAs entered into in the [first five months of 2024](#) is equal to number of PPAs entered into in 2022 and is only two down from the [16 across 2023.](#)

The continued prevalence of UK headquartered and operating organisations in the membership of the RE 100; a group of companies pledging to meet 100% of their energy requirements from renewable sources further indicates that the market will continue to grow as businesses seek to meet these commitment aims in the most commercially sensible manner.

#### Notable Deals

July 2023 saw the UK's first hybrid PPA deal entered into by DIF Capital Partners and Engie which covered 55MW of solar production in Bedford; combined with 40MW/80MWh of battery energy storage. [The hybrid Corporate PPA trend continued in 2024 with Statkraft,](#) Europe's largest renewable power generator, signing a ten-year PPA with international investor FP Lux Group FP for the Scurf Dyke Solar Farm and an 8 MW Battery Energy Storage System in Yorkshire.

Statkraft were involved in other notable Corporate PPAs in 2024, including one with Boralex for the 106MW Limekiln Wind Farm in the Scottish Highlands and another with Luminous Energy for the 5MW Bracon Ash Solar Farm in [Norfolk.](#) Separately, RWE signed their first UK Solar PPA with a [potential installed capacity of 49.9MW.](#)

Meanwhile, [Tesco](#) demonstrated ambitious targets with an announcement in May 2024 that it signed a new deal with EDF Renewables UK to take 150GWh of power from Stranoch windfarm every year. This is in addition to a commitment to onsite private-wire PPAs with solar developers across 100 stores locations over the next three years.

### PPA Structures

The aggregated nature of the electricity grid and the regulatory framework has meant that the large majority of Corporate PPAs in the United Kingdom have been concluded using the “sleeved” structure and this remains the most popular structure in the UK market.

Whilst the “synthetic” PPA approach popular in the US has been used in the past in the UK, notably by Marks & Spencer who adopted a CfD structure for 20 projects, these still remain in the minority within the UK market.

We have also begun to see more deals (as mentioned above) in the “hybrid PPA” model which covers both a power project and a battery storage system.

The “mini-utility” model, where suppliers offer a range of 100% renewable tariffs from their generation projects to business and domestic consumers, also continues to gather momentum in the UK. This ties in with Octopus Energy’s “Electric Match” product which matches energy consumers renewable electricity demand needs (in half hourly intervals) with generators generating during that same period. Octopus Energy, an arms-length supply company of Octopus Investments, the UK’s largest solar investor, is now one of the UK’s major domestic energy suppliers. Other notable examples of the mini-utility model include Ecotricity and Good Electricity. These types of models could see a shift from more traditional corporate PPA structures.

# USA

While the United States remains the largest renewable PPA market in the world, PPA deal volume experienced a slight decline in the US in 2023, compared to the record commitments to renewable generation seen in 2022.



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While the United States remains the largest renewable PPA market in the world, PPA deal volume experienced a slight decline in the US in 2023, compared to the record commitments to renewable generation seen in 2022. Higher interest rates, an uncertain regulatory landscape and lingering effects of the global supply chain constraints of prior years caused US PPA prices to rise during 2023 at a rate unmatched by increases in US power prices, slowing the execution of PPAs. It's not all bad news, though. Despite the downturn in year-over-year PPA execution, US renewable generation grew at a record pace during 2023, and the growth outlook for 2024 remains just as strong, driven by the benefits of the Inflation Reduction Act and decarbonisation demand from public and private entities. As has been in the case in recent years, corporate and industrial purchasers are expected to continue to drive the US renewable PPA market in 2024.

## Regulatory & Market Structure: Retail & Wholesale Markets

Any overview of the US market would be lacking if it did not first address its regulation and structure.

The US energy market is split between retail (i.e., direct sales to the end-user) and wholesale (i.e., sales for resale) markets.

Retail markets are strictly governed by state law and are subject to state regulatory commissions. There are fifty states in the US and thus, in a sense, fifty separate retail markets.

Wholesale sales outside of the state of Texas are regulated by the Federal Energy Regulatory Commission ("FERC"). While a small portion of the wholesale sales in Texas are regulated by FERC, the substantially larger portion of wholesale sales are subject to the rules, regulations and market practices of the Electric Reliability Council of Texas ("ERCOT") and the Public Utility Commission of Texas.

Broadly speaking, FERC regulates wholesale markets through its review of the tariffs, business practices and policies of the numerous public and private bodies that control the transmission systems serving customers within their respective control areas. These wholesale markets fall into two basic categories:

1. "Organised Markets" controlled by independent system operators, such as the California Independent System Operator ("CAISO") and New York Independent System Operator ("NYISO"), and regional transmission organisations, such as the PJM Interconnection and Midcontinent Independent System Operator, Inc. ("MISO"); and,

2. "Bilateral Markets" such as those in the Western Electricity Coordinating Council ("WECC") and SERC Reliability Council ("SERC"). While not regulated by FERC, ERCOT falls into the Organised Market category.

This web of markets and regulations means that corporate off-take arrangements take a variety of different forms. For the sake convenience, we'll refer to them as:

- "Direct Sale PPAs",
- "Community Solar PPAs",
- "Sleeved" Corporate PPAs,
- "Behind the Meter" PPAs, and
- "Synthetic PPAs", or "Virtual PPAs".

## Direct Sale PPAs

In states that allow a customer to choose its retail electricity supplier, such as Texas, California, Illinois, Massachusetts, Michigan, Ohio, Pennsylvania, New Jersey and New York, a retail energy supplier can contract directly with the customer to provide renewable energy. Direct Sale PPAs are subject to various state regulatory policies and limitations, such as customer size limits.

Additionally, in California, a market limit only allows Direct Sales up to an overall historical maximum load amount set for each regulated utility. Direct Sale providers are generally required to register with the state regulatory commission, although regulation of retail providers who service larger commercial and industrial loads, is light.

### Community Solar PPAs

Community Solar PPAs are found in states in which state law and regulation permit “community solar projects”. Community solar programmes differ from state to state, but generally involve two separate agreements. First, the project owner enters into a contract with the participating utility, pursuant to which the owner sells, and the utility purchases, energy and Renewable Energy Certificates (“RECs”) from the community solar project.

Second, the project owner enters into a contract with a customer (the “Subscriber”) pursuant to which the project owner passes through “billing credits” to the Subscriber that are generated under the programme, and the Subscriber pays the project owner a fee.

The programmes generally limit concentration (i.e., the project’s offtake must be made available to the “community” of offtakers). For example, Minnesota’s community solar programme requires that no single Subscriber be entitled to more than 40% of the offtake from any one project. Subscriber contracts generally impose some limitations on the Subscriber’s flexibility to materially modify its load, assign the contract, or otherwise change the basic structure of the supply relationship embedded in the Subscription contract. These limits are imposed as the project owner has to maintain a certain level of commitment from Subscribers, or risk losing the right to serve its Subscribers (and the associated economic benefit of receiving payments from the Subscribers).

### Sleeved PPAs

This form of offtake agreement is found in states where a direct sale to retail customers is either prohibited by state law or permitted only in limited, expressly approved circumstances. Cooperative and municipal utilities will, at times, agree to sleeve a sale to a large customer. Investor-owned utilities may also agree to sleeve power from a renewable generator – although this is the exception, rather than the rule,

and at all times requires some level of approval by the state regulatory commission.

### Rocky Mountain Power’s Schedule 34

One example of an approved sleeve is Rocky Mountain Power’s Schedule 34, which is applicable to the utility’s Utah customers. Under Schedule 34, Rocky Mountain Power executes a PPA with its retail customer and a second back-to-back PPA with the renewable generator. The PPA with the renewable generator terminates at Rocky Mountain Power’s election if the retail customer defaults or terminates its contract with the utility.

### Behind the Meter PPAs

“Behind the Meter” PPAs are also found at the retail level. The name, “Behind the Meter”, refers to electricity generation that serves a retail customer, by directly offsetting the electricity load otherwise served by a utility. “Behind the Meter” PPAs are subject to state regulation and are generally limited to relatively small renewable generators and combined heat and power applications. State regulation will often limit the total amount of electricity load served by behind the meter generators.

### Synthetic or Virtual PPAs

If a corporate offtaker cannot receive service at the retail level through one of the structures identified above, the corporate offtaker will look to the “Synthetic” Corporate PPA (or as they are called in the US, a “Virtual PPA” or “VPPA”). While retail sales and independent renewable credit sales still occur, it is safe to say that the VPPA is now the predominant model for sales from renewable energy generation.

For the most part, the covenants found in a VPPA match those found in a traditional wholesale PPA with a utility. However, VPPAs differ from utility PPAs in certain key areas.

Given the general restrictions and limitations placed on direct retail sales, the VPPA will expressly disclaim any physical sale or delivery of energy. Instead, the VPPA follows the form of a contract for differences. The VPPA includes a “Fixed Price” (which is set in the VPPA and, ironically, can be either fixed or escalating), and a “Floating Price” based on the market price (usually the locational marginal price, “LMP” at a market “hub”). If the Floating Price exceeds the Fixed Price, the renewable generator pays the corporate offtaker the difference between the two.

If the Fixed Price exceeds the Floating Price, the corporate offtaker pays the renewable generator the difference. The VPPA contemplates, and may expressly require, the sale of physical energy by the renewable generator in the real-time or day ahead LMP, at the renewable generator's point of interconnection.

### Virtual PPAs: The Challenges

VPPAs raise a number of issues, the first of which is credit support. Corporate offtakers may or may not have adequate credit to cover the market exposure faced by the renewable generator. (The renewable generator will also be subject to credit requirements.) In contrast to utilities, which are thought to have relatively stable credit ratings, corporate credit ratings can be volatile.

The second issue that arises from VPPAs is the pricing structure. Neither the corporate offtaker nor the renewable generator will want the Floating Price (or the price at the point of interconnection) to be easily manipulated or subject to large, unpredictable, price swings. Thus, VPPAs are generally associated with renewable generation located in liquid Organised Markets such as ERCOT, SPP and PJM.

A third, related, issue, is basis differential. Both parties will want to minimise the difference between the Floating Price it is subject to in the VPPA, and the price at which the sponsor sells its physical electrons. Depending on the market, and more importantly the LMP at the project's physical location, this means that the Parties will want to negotiate whether the Floating Price is to be set at the market hub or the physical point of the project's interconnection (the "node").

Fourth, and finally, price floors will often be a subject of negotiation. The corporate offtaker may not want to be exposed to a Floating Price below zero. In contrast, the renewable generator (if it is a wind project) will want to keep generating to get the benefit of the production tax credit ("PTC"). The PTC is the primary incentive for wind generation development in the U.S. In contrast, solar generation receives the investment tax credit, a benefit not tied to capital investment or production.

### Distinct Features of VPPAs

While the pricing structure of a VPPA shares features with a pure financial hedge from a bank or other hedge provider, it differs from a financial hedge in a few key respects.

In contrast to many financial hedges, the energy quantity in a corporate VPPA is not fixed.

Energy deliveries under a VPPA are generally on an "as-available" basis – subject to the availability or performance guarantee mentioned below. Second, the VPPA will always involve a commitment of the renewable credits ("RECs" or "Green Tags", in the parlance of VPPAs) and other attributes produced by the renewable generator.

### Evolution of REC Requirements in VPPAs

The REC requirements in VPPAs have evolved. While in the past, VPPAs may not have required delivery of RECs produced by the specific generator built and operated by the VPPA counterparty, current VPPAs tend to include a commitment of RECs from the renewable generator's facility. Corporate offtakers want to tie the RECs to a specific renewable generator's facility.

### Reputation, Confidentiality & Publicity in VPPAs

Another unique feature of the VPPA is the importance of reputation, confidentiality and publicity to the corporate offtaker.

Corporate offtakers may want the specifics of the VPPA held strictly confidential and will want strict controls over publicity around the VPPA and the facility. Many corporate offtakers will insist upon naming rights to the facility and control over signage.

### Other Notable Features of VPPAs

Two other elements of VPPAs that distinguish these agreements from other PPAs, are worth mentioning. Given the pricing structure, the reporting requirements of the Dodd-Frank statute must be considered.

In almost all cases, the corporate offtaker will place the reporting obligation under the Dodd-Frank Act on the renewable generator. The timing and content of the reporting obligations should be considered and understood by the renewable generator.

While corporate offtakers may commit to large amounts of capacity, they are often seeking a commitment that will be less than the ideal size of a renewable generator. Thus, the corporate offtakers often commit to a prorated fraction of the total energy generation and REC production of a renewable generator.

This factor requires that consideration be given to how multiple corporate VPPAs work together, in terms of the commitments to commercial operation, curtailment and dispatch, liquidated damages and events of default.

### VPPAs & Traditional Wholesale PPAs: Similarities

As noted above, many of the provisions in a VPPA raise the same commercial considerations present in a traditional wholesale PPA.

Thus, a VPPA will include: (a) requirements for establishing commercial operation and liquidated damages if commercial operation is delayed; (b) provisions requiring operation and maintenance consistent with prudent industry practices; (c) guarantees of mechanical availability and, at times, performance; (d) termination and damages provisions for default; and (e) provisions addressing force majeure events. (With respect to force majeure events, we note that COVID-19 and its effects are a key topic of discussion in all PPAs and VPPAs).

### US Markets: Challenges & Disruptions

There were several challenges for US renewables markets in 2023, which created uncertainty for renewable energy developers and buyers, drove up US PPA prices, and slowed US PPA execution:

- First, were the interest rate hikes that took place during the first half of 2023.
- Second, were the trade investigations on tariff circumvention (the negative pricing effects of which were suspended during 2023 by a moratorium put in place by President Biden that expired in 2024).
- Third, were rulemakings relating to US statutes that prohibited the use of forced labour – a potential issue for Chinese photovoltaic module suppliers.
- Fourth, were the continued impacts of supply chain disruptions arising from, and related to, the COVID-19 pandemic, including expensive equipment contracts entered into by renewable developers in prior years, when supply chain conditions were tighter, and there were longer lead times in sourcing equipment.

- Last, were lengthy permitting processes and interconnection queues that delayed the ability of US renewable projects to achieve commercial operation.

While we expect certain of these market conditions to stabilise in 2024 with the anticipated lowering of interest rates, a number of concerns remain for the contracting of US renewable projects. These include issues such as the ramp-up of U.S. manufacturing, reforms to independent system operator interconnection queues and the continued federal, state and corporate decarbonisation demand, and uncertainty about both pricing (including construction costs).

Each of these issues raises commercial and legal concerns that should be carefully considered in order to maximise the opportunities available across renewable PPAs in the US.



# Our Energy & Utilities Group

Bird & Bird LLP is an international law firm. We combine exceptional legal expertise with deep industry knowledge and refreshingly creative thinking. We have over 1700 lawyers in 32 offices across Europe, the Middle East and Asia-Pacific, as well as close ties with other firms in other parts of the world.

## Leaders in the Energy Transition

The global energy transition has for over 20 years been the central part of our work across the energy and utilities sector with an expert team of more than 250 lawyers internationally, giving us a deep understanding of the challenges our clients seek to address.

Our lawyers have been at the forefront of the green economy and global energy transition for over 20 years. We are a number 1 ranked renewable energy team who have advised developers, investors, funders, EPC contractors, off-takers and regulators across a number of jurisdictions around the world.

As an international team, our sector approach is not broken down by offices but into sub-groups that focus on particular aspects of the Energy & Utilities sector.

The combination of our strengths in the global energy transition and the technology specialism for which we are better known, means that we are ideally placed to support stakeholders involved in new methods of energy generation and management.

We understand key business processes and work closely with industry bodies in order to influence and shape markets. We will help you to anticipate change, deliver solutions and implement strategies.

With over 500 green economy cross-border deals in recent years, our expert team knows how to efficiently structure and manage renewable transactions and financings covering all legal and regulatory requirements with a risk-based approach.

## Key Focus Area: Renewable Energy

A key focus area for us is renewable energy, covering solar, wind, biomass, anaerobic digestion, energy from waste and energy efficiency.

We have been at the forefront of legal advice in the renewable energy industry for over a decade. We provide a full range of transactional support throughout a renewables project, acting as a one-stop-shop.

Our lawyers have advised developers, landowners, EPC contractors, off-takers, regulators, banks and investors across a number of jurisdictions.

### Power Purchase Agreements (PPAs)

Our industry experience has meant we have closely tracked the emergence of PPAs of all types (including route-to-market, corporate (physical and financial) and private wire). This includes longstanding experience on corporate PPAs where global multinational corporations are buying electricity directly from renewable developers on a physical or financial basis. This completely revolutionises the market for renewable power from subsidy and utility driven to market demand driven. We are at the forefront of this market, having developed and negotiated innovative contract and business PPA structures.

Bird & Bird's lawyers advised on some of the earliest Corporate PPAs (in 2007 in the Netherlands and in 2009 in the UK). We have become an experienced advisor on these structures globally. Since Bird & Bird's initial engagement on some of the earliest Corporate PPAs, the appetite for Corporate PPAs has grown considerably.

### Market recognition

We have one of the leading international energy practices in the world. Our Energy & Utilities Group has been recognised by the Clean Energy Pipeline Legal League Tables 2024 for closing 172 M&A and Project Finance clean energy deals globally in 2023 – the highest total of any law firm. This includes being the number 1 firm globally for M&A deals by volume in clean energy in the Clean Energy Pipeline Legal League Tables 2024.

Our energy transition work has won us The Lawyer's Energy & Infrastructure team of the year in 2021 & the European Corporate Team of the Year Award at The Lawyer European Awards in 2022.

*No.1 ranked as the Most Active Law Firm for Clean Energy M&A*

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