

2020/2021 Edition

# Bird & Bird & Corporate PPAs

*An international perspective*



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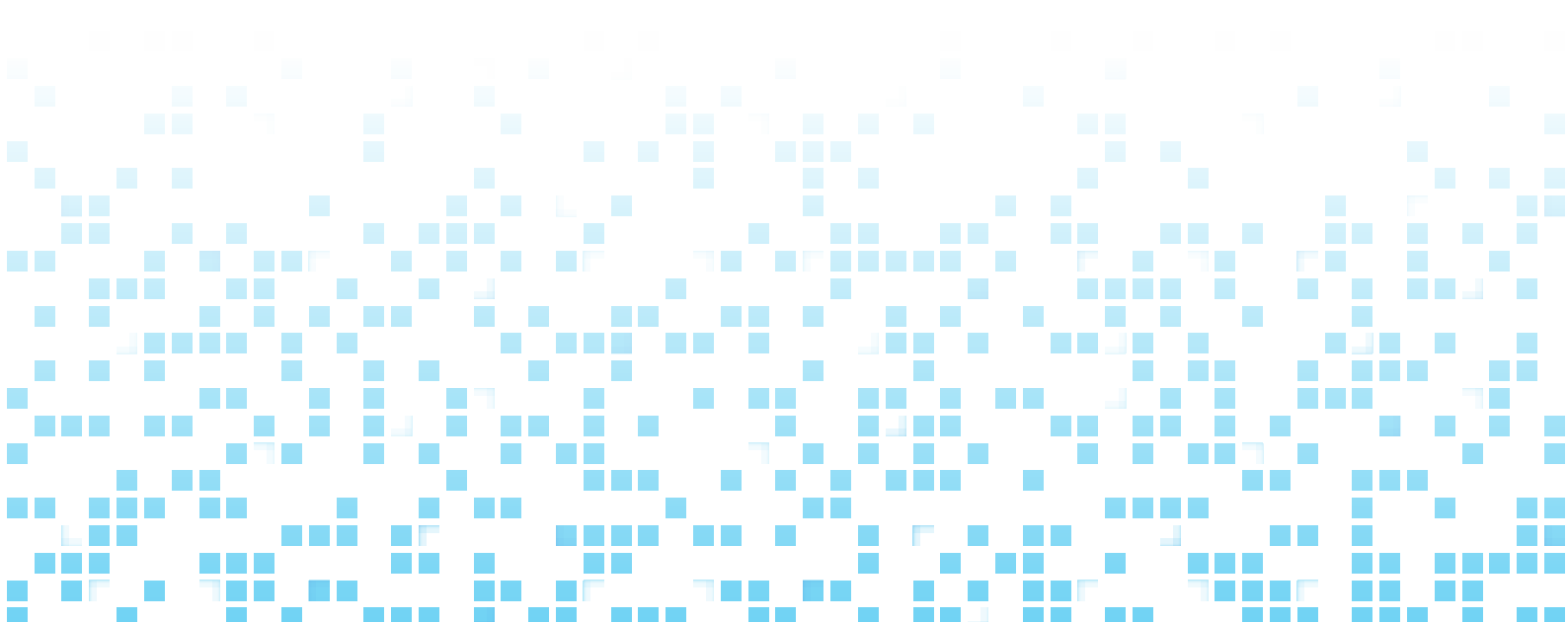
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# Introduction

*Large corporations are continuing to set the agenda for the growth of renewable energy across the globe. In 2019, more than 100 corporations purchased 19.5GW of clean power directly from generators under a Corporate Renewable Power Purchase Agreement (Corporate PPA). In 2020 global Corporate PPAs reached a total of 23.7 GW. Despite the COVID-19 pandemic 2020 was a new record year. The data shows corporates still have a strong appetite for Corporate PPAs in order to take advantage of a range of sustainability, economic, reputational benefits.*

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.

This paper looks at the main drivers behind the growth of Corporate PPAs, and addresses several innovative structures and comments on the market for them in key jurisdictions across Western and Eastern Europe, the Nordics, Asia-Pac and the USA.



# The Global Corporate PPA Market

## What is a Corporate PPA?

A Corporate PPA allows corporate energy consumers to purchase power on a long term basis directly from renewable energy generators without being co-located. This is an alternative to the traditional model where a utility purchases power from lots of energy generators, transports it on the electricity grid and then on-supplies power to the corporates. Corporate PPAs are long term agreements (typically between 10 - 20 years) and provide price certainty for both the corporate and the generator by using fixed or floor pricing structures. Please see pages 7-8 of this paper for further information on structures. For the purposes of this paper we have excluded discussion about on-site PPAs.

## The Global Market

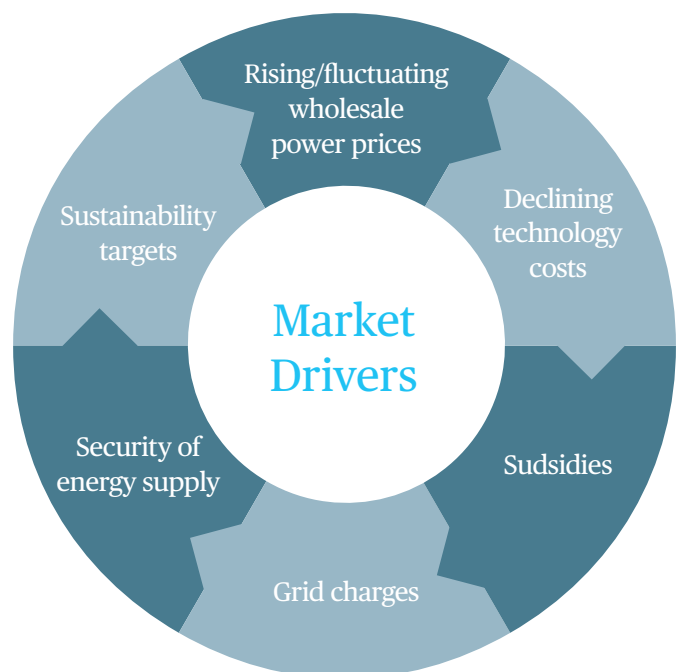
As stated in our introduction, we saw continued major growth in the Corporate PPA market in 2020, with the European market now almost counting for half of that figure. This can be explained by the large drop off in the USA due to the COVID-19 pandemic. The Saudi Arabia and Russia oil price war also led to steep declines in power prices, compounded then by a drop in electricity demand due to COVID-19. Whilst we certainly did see developer and corporate appetite to sign Corporate PPAs during the turbulent times of 2020, it is true to say that many longer term deals could well have been delayed until market stability is restored and power prices increase to an acceptable level for developers.

Within Europe, activity remains particularly strong in the Nordics, where companies are attracted to plentiful wind resources and the Nordpool power market, facilitating the cross-border sale of power between Sweden and Norway. Corporate PPA deals in Norway, Sweden, Denmark and Finland made up nearly half of European activity in 2019. Markets in Spain, Italy, Poland and Germany are picking up - for example the first two Corporate PPAs were signed in Germany. Elsewhere, Australia is an exciting market particularly for synthetic and behind the meter PPAs, driven by relatively expensive wholesale power prices and strong renewable resources.

Major players in the global Corporate PPA market remain tech companies and data centre owners such as Google, Apple, Amazon and Microsoft. By December 2020 Amazon had secured 3.4GW of new PPAs, allowing it to surpass Google as the world's largest purchaser of renewable energy with 6.5GW under contract. Companies from the heavy industries also continue to drive corporate demand, including oil & gas companies (e.g. Occidental Petroleum, Chevron and Energy Transition Partners) and chemical companies (e.g. Covestro and Borealis)

New structures such as the proxy generation PPAs and volume firming agreements are being explored (see further information on page 11). Also, new club structures are enabling smaller corporates to benefit from Corporate PPAs, and this is a concept that continues to be developed further (see further information on page 10). Blockchain PPAs offers transformational technology that could hugely help aggregate corporate demand and match it with renewable energy generation in an automated way (see further on page 12).

The future outlook therefore provides for optimism. Global corporates continue to be increasingly





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conscious about managing their energy needs and being seen to act sustainably by procuring electricity directly from renewable sources has become a strategic priority.

Over 280 companies are now members of RE100, a group of companies who have pledged to work towards meeting 100% of their energy requirements from renewable sources, and the numbers are continuously increasing. Their membership base is also diversifying with 42% of new members coming from the Asia-Pacific region.

## Regulatory Update

Further cause for optimism can be seen through the EU's adoption of the recast Renewable Energy Directive (RED II) in December 2018. RED II includes ambitious drivers for the uptake of Corporate PPAs in Europe including a binding EU-wide 32% renewables target for 2030 and an enabling framework for the uptake of Corporate PPAs. Importantly, RED II requires Member States to assess the regulatory and administrative barriers to Corporate PPAs and to remove unjustified barriers to, and facilitate the uptake of, Corporate PPAs. This will be monitored through the integrated national energy and climate plans which Member States must submit pursuant to directive. In addition to this, RED II:

- a. requires Member States to recognise guarantees of origin (GOs) issued by other Member States in accordance with RED II; and
- b. clarifies that Member States may allow the issue and transfer of GOs directly to corporate off-takers pursuant to a Corporate PPA from renewable generators that already receive financial support from a support scheme (e.g. feed in tariffs).

The latter point is important as it reverses a previous proposal by the European Commission that would have required Member States to ensure that GOs from renewable generators that already receive financial support from a support scheme are placed into a central auction, as opposed to allowing them to be transferred directly to off-takers under a Corporate PPA. This would have had a negative effect on Corporate PPAs given that one of the key drivers to

a corporate entering into a Corporate PPA is being able to demonstrate through GOs that it has procured power from renewable sources. However, Member States can (still) opt not to allow the issue of GOs in this way for renewable generators that already receive financial support from a support scheme.

Member States must transpose RED II into national legislation by 30 June 2021. While certain aspects will depend on how each Member State transposes the requirements of the directive into national law, the creation of an enabling framework to facilitate the transfer of GOs across borders and to encourage the conclusion of Corporate PPAs can only help to drive growth in this exciting market.

## Regulatory Issues - Financial Services

With synthetic Corporate PPAs, in parallel to the conventional contracts between the parties, the Generator and the Corporate will enter into a contract for difference or other financial derivative contract where they agree a fixed strike price for the renewable electricity provided by the Generator (Virtual PPA or VPPA). The Generator and the Corporate settle the difference between the fixed strike price and the variable market price at which the Generator sells the renewable electricity it produces to the utility supplier. This serves as a financial hedge to the electricity price at which the Corporate purchases under its standard electricity supply contract with the utility.

The Generator and the Corporate will each need to consider whether they are carrying out a regulated activity under financial services laws because a VPPA (as a contract for difference) may constitute a regulated financial instrument. In addition to authorisation requirements, the Generator and the Corporate will also need to consider reporting requirements under MiFID II and obligations under European Market Infrastructure Regulation (EMIR) which may include reporting, margin, risk mitigation and recordkeeping obligations. Legal advice needs to be sought to consider whether any of these requirements apply to the Generator or Corporate when entering into the VPPA.

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# Opportunities and threats

## Corporate Consumer

### Opportunities

- Fix/floor/cap power price - hedge against rising or fluctuating energy prices in the wholesale markets.
- Achieve sustainability targets and objective to buy 100% of power from renewable sources. This has become as important, if not more important, than economic drivers.
- Smaller corporates can club together to share risk and enhance bargaining power.
- Blockchain PPAs as an easier way to aggregate demand with other corporates and enter the market.

### Threats

- Board appetite for the deal - economic benefits only stack up if the board trusts the power price forecasts. Board often unwilling to pay more in short-term for lower prices in long term.
- Complexity/costs in negotiating the contracts. Power purchase is not core business. 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 re-negotiation.

## Generators

### Opportunities

- Generator 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 (on the expectation that this will pay off in the long-term when prices rise and corporate still has the benefit of the fix).
- The phasing out of renewable subsidies means that Corporate PPAs offer a new route to market for generators.
- Blockchain PPAs as an easier route to match generation with corporate demand and to access higher tariffs.

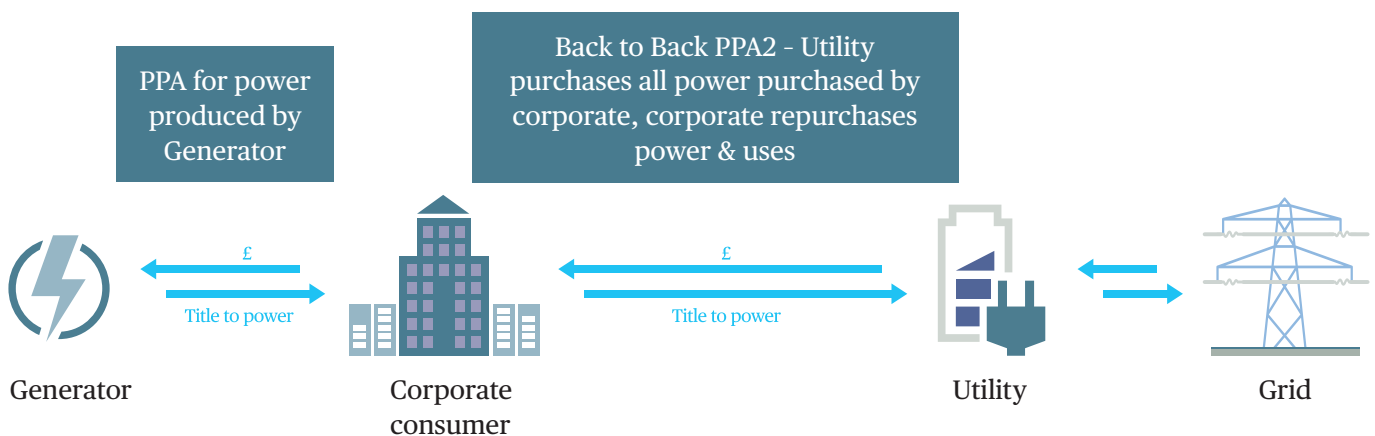
### Threats

- Price - the price the corporate is willing to pay / set the floor at 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?

# Corporate PPA contract structures

The two leading models for Corporate PPAs are (a) the “Sleeved” Corporate PPA; and (b) the “Synthetic” Corporate PPA. The Sleeved Corporate PPA is the contract structure that has mainly been adopted in Europe, whereas the Synthetic Corporate PPA has been the preferred contract structure in the USA. We are now seeing more appetite for the Synthetic Corporate PPA structure in Europe, primarily because it is seen as a simpler contract to execute.

## A) “Sleeved” Corporate PPA



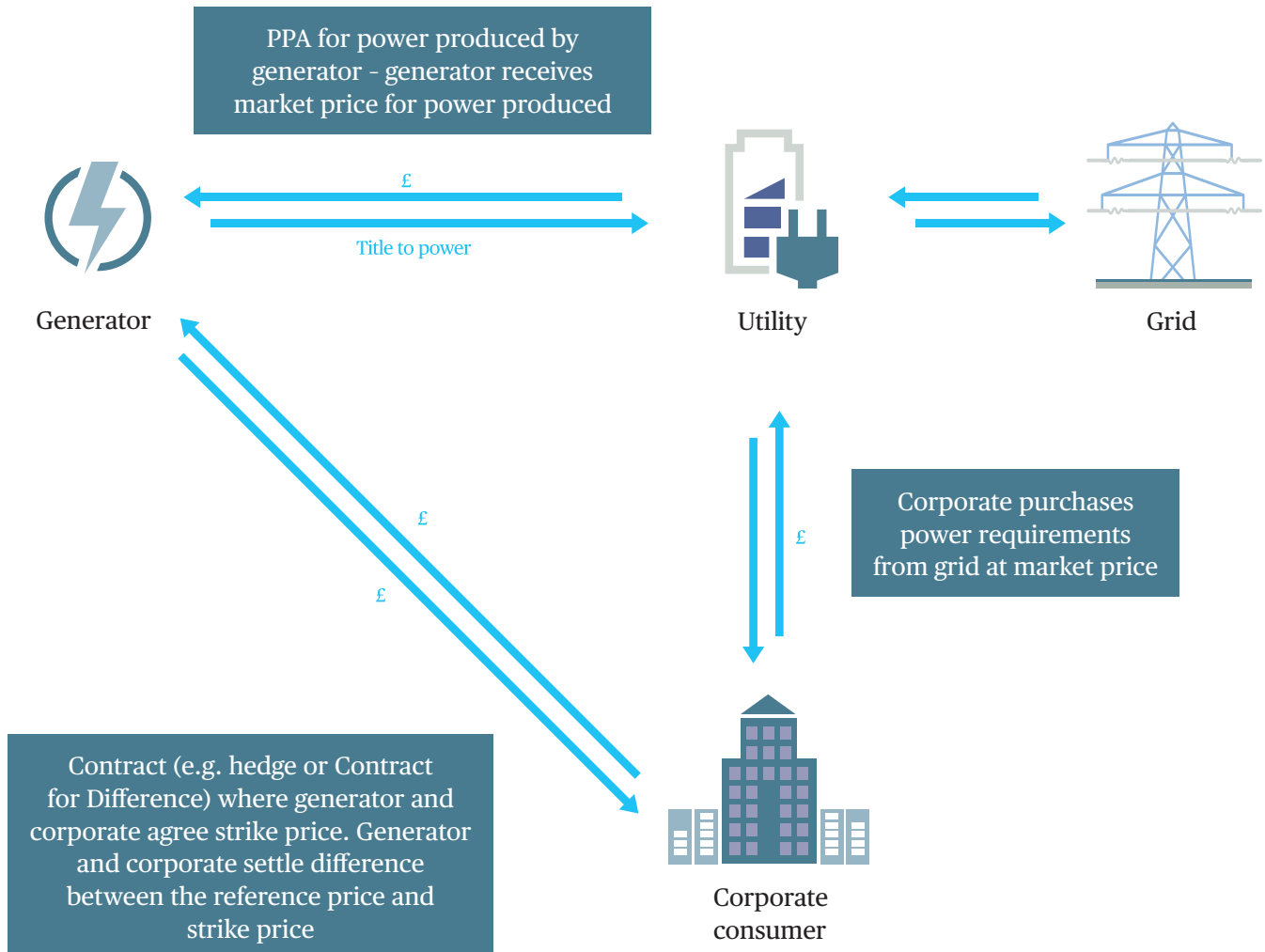
## Key features

Generator sells power directly to the corporate and the utility then sleeves the power through the grid and supplies it to the corporate’s site (together with top up power as necessary):

1. Generator sells power at the meter point to corporate consumer under PPA1.
2. Corporate consumer immediately on-sells power at the meter point to the utility under PPA2. The utility then “sleeves” the power through the grid and sells power to the corporate consumer at its site. The utility will perform a balancing service under this PPA2 (renewable energy is intermittent) by topping up the renewable electricity with extra if needed (for example when the generator is not generating).
3. Renewable benefits can be sold either from generator to utility or from generator to corporate consumer.
4. Regulatory regimes usually require a licensed utility to be involved to put electricity onto the grid (i.e. transport the power from the generator’s site to the corporate consumer’s site).
5. The generator can be entirely independent or sometimes the corporate consumer may make an investment into the generator itself to support the project (and open a new revenue stream in potential dividends).
6. Depending on the regulatory regime, the licensed utility and balancing party may be the same entity (as in the UK) or separate entities (as in the Netherlands).

# Corporate PPA contract structures

## B) “Synthetic” Corporate PPA



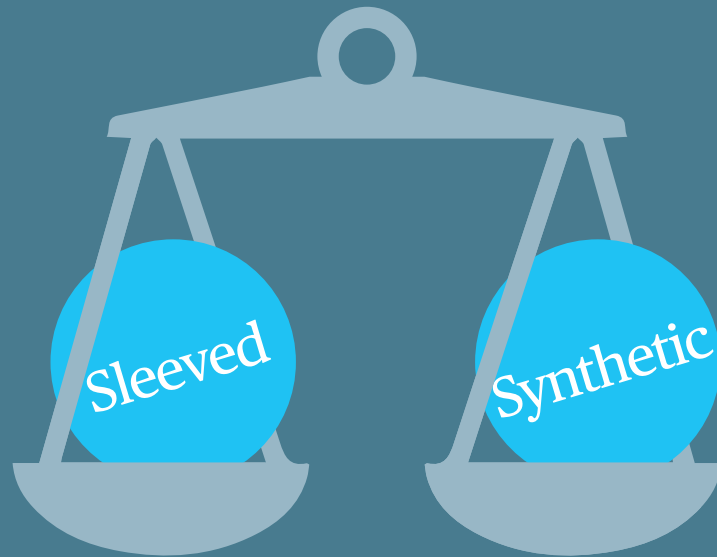
### Key features

Generator “virtually” sells the power that it produces to the corporate for a strike price.

1. Generator sells renewable electricity to a utility under a standard power purchase agreement at a market price.
2. Utility continues to sell power to the corporate consumer under a standard electricity supply agreement at a market price.
3. In parallel to these conventional contracts the generator and the corporate consumer enter into a contract for difference, option or other financial
4. hedge where they agree a strike price for the renewable electricity produced by the generator (Derivative Contract/VPPA). Generator and corporate consumer settle the difference between the strike price and the variable reference price. This reference price is usually based on a wholesale price index. The contract for difference therefore provides a hedge between the strike price and the reference price.

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# Which model to choose?



## Sleeved

Direct contract to purchase power from the generator - easier to show power used is procured from renewable sources.

Corporate and generator must be on the same aggregated grid system (so a sleeved model would not work across e.g.US states or EU Member States).

## Synthetic

Power can be sold “virtually” across separate energy markets (e.g. across US states or in theory across EU Member States). This has been a strong driver for use of synthetic PPAs in the USA (the USA energy market is disaggregated).

Arguably a simpler structure - it is a contract for difference/financial hedge, rather than two back to back contracts for sale of power.

This structure requires the Generator and Corporate to enter into a contract for difference which may be a regulated financial instrument and so there is a need to consider whether this involves carrying out a regulated activity requiring financial services authorisation (for example under MiFID II ) or compliance with reporting or margin obligations (such as under European Market Infrastructure Regulation (EMIR)).

Note: when deciding which model to choose, the corporate’s preferred accounting treatment for the Corporate PPA should be considered.

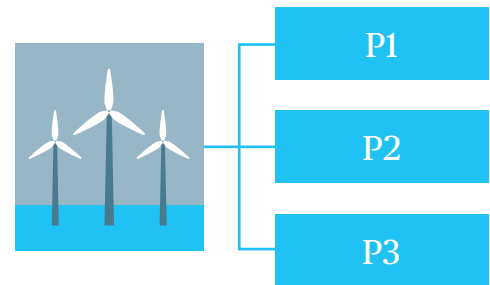
# Optimisation of structures

## Aggregation models

As the volume under a single Corporate PPA is often large with long term commitments, the traditional Corporate PPA structures are predominantly used by large energy consumers such as tech companies and the chemical industry. There is an increased interest from smaller corporates looking to move to renewable energy consumption, however often smaller corporates will find themselves with projects which are too big for their offtake requirements. In that case, one of the following aggregation models might be a solution<sup>1</sup>.

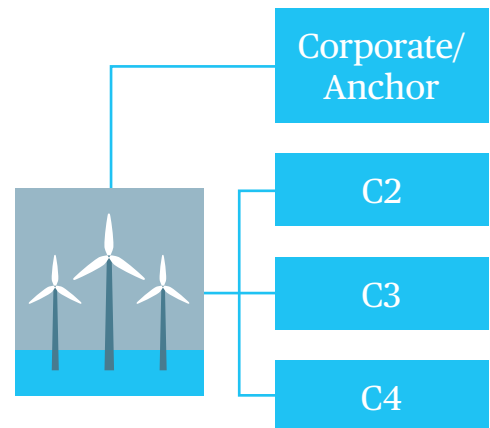
### Club

Under the club structure, large corporates club together to aggregate their energy offtake. A great example of the club structure is the Dutch wind consortium formed by Google, AkzoNobel, DSM and Philips. The corporates joined forces to optimise the Corporate PPAs they entered into for the offtake of energy produced by two wind farms. The corporates each committed to one quarter of the energy offtake of each project, all on similar terms and conditions. The search for the “ideal partners” and the formation of the club takes a considerable amount of time, however, once clubbed together the corporates can benefit from the economies of scale and power of negotiation. Also, the model can be re-used several times. This club was the first in Europe. In the US, the structure is more commonly used.



### Anchor tenant

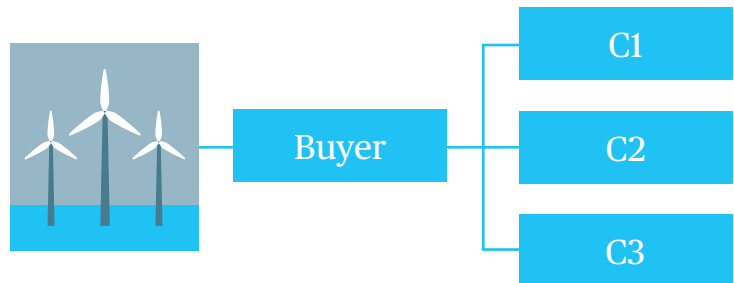
Under this structure, a large offtaker commits to the offtake of a large portion of a project, securing the repayment of the debt by the generator. Smaller corporates can tag along to the project and may secure a Corporate PPA for a smaller part of the project and for a shorter term, either with the large offtaker or with the generator itself. However, some generators may be reluctant to be flexible on the contract terms as the smaller corporates are not material in obtaining financing.



<sup>1</sup> Source: Joining the club: Collaborative Offsite PPA Structures for Renewable Energy Buyers, a joint paper written by Schneider Electric and Bird & Bird LLP.

## *Reselling*

This structure is less common as the benefits are limited. Here a large corporate purchases 100% of the offtake of a project and then resells it in predetermined tranches to smaller corporates. There is little to no flexibility for a smaller corporate to negotiate the terms of the contract. This reduces the upside compared to buying on the market.



## Proxy Generation PPA & Volume Firming Agreements

### *Price risk*

As there are plenty of hedging and other financial instruments available in the market, price risk (taking on the risk of a fixed/floor/capped price) often sits well with the corporate as its main reason for entering into Corporate PPA is price predictability. Also, this may provide the flexibility a corporate needs from an accounting point of view to avoid the Corporate PPA being classified as a derivative.

### *Operational & weather risks*

Often the negotiations of a Corporate PPA evolve around an appropriate risk allocation for operational and weather risks. Both of these risks can cause the plant to produce less than forecast, producing an imbalance on the electricity trading system (and associated charges).

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 risk associated with the operation of the plant should not sit with the corporates, and should remain with the generator. 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.

Whereas 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 projects specifics and its power curve, shifting such operational risk back to the project. Upon 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 lags behind the agreed expectations, 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. Microsoft has been very active in developing solutions for the allocation of operational risk.

As well as operational risks, renewable energy projects are also unique in that the output from them will be variable throughout any day, due to intermittency of the weather. Weather patterns can be predicted to a certain extent but never with 100% certainty or far ahead of time. Microsoft has also developed, together with its partners, the 'volume firming agreement' protecting corporate buyers against the intermittency and weather risk that comes with renewable projects. These agreements shift the 'shaping' risk relating to the intermittency of a project away from the corporate buyers by offering them a 'baseload' or fixed amount of electricity throughout the day. The generators taking on such weather risk will resort to storage and balancing solutions, or may seek to back off the risk with insurers who are comfortable dealing with such risks.



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## Blockchain PPAs

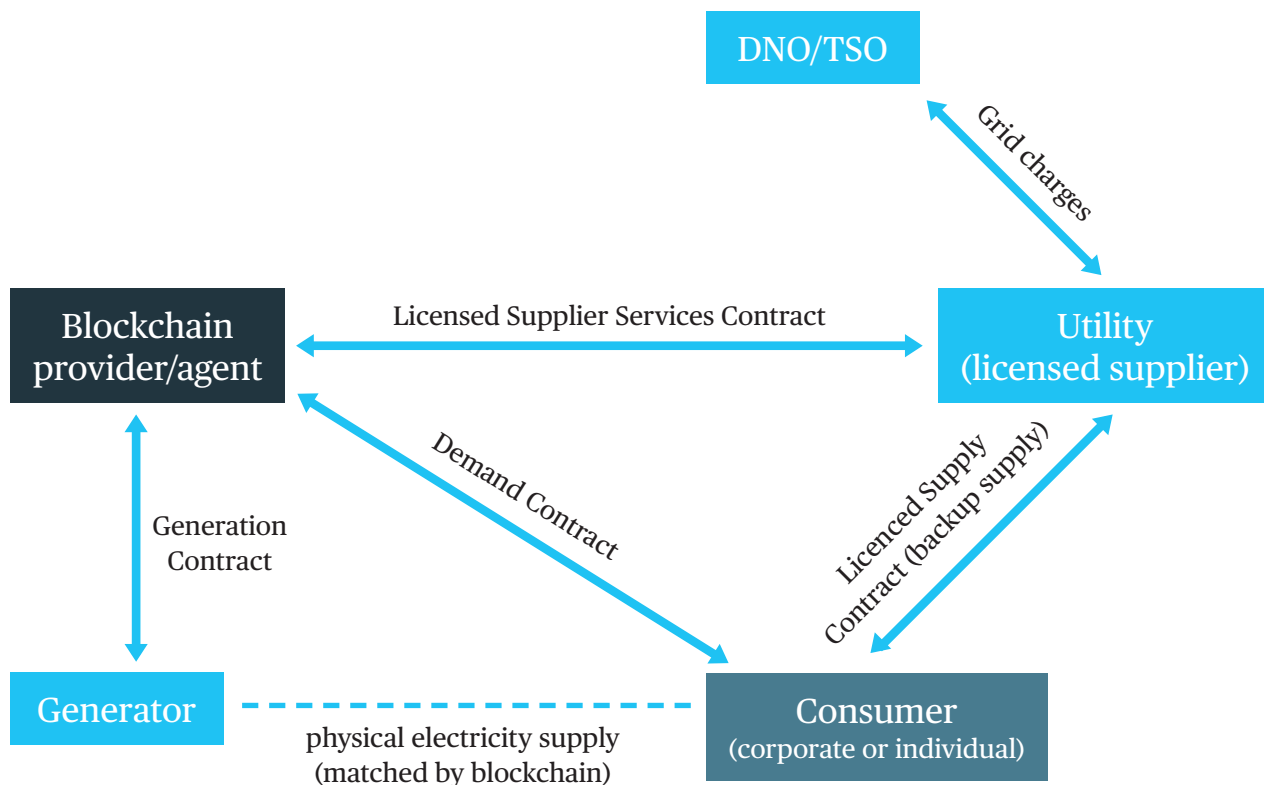
In 2020 we saw increased use of blockchain in the energy sector, including in the PPA space. Blockchain can be used to create local energy markets (via virtual power plants) by aggregating and matching generator supply and consumer demand in an automated way. Both generators and energy consumers can enter into a contract with a blockchain platform provider. The blockchain provider then agrees 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 the corporate enters into with the blockchain provider is simpler than a corporate PPA entered into directly with a generator would be (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.

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, 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 overcome.



## Blockchain PPAs - Example Contract Structure



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# International Case Studies

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# United Kingdom



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

## Corporate PPA Market in the UK

The UK Government's Energy White Paper (published in December 2020) and Prime Minister's Ten Point Plan for a Green Industrial Revolution make clear that renewables form an important part of the UK's commitment to net zero by 2050. Onshore wind and solar are described as being key building blocks of the future generation mix, along with offshore wind. Whilst the CfD scheme will continue in the UK, it will remain highly competitive and so we think Corporate PPAs will remain as an important means of adding more renewables to the grid.

Corporate PPAs have been around in the UK for some time. However, it is only in more recent years that they have become more prominent. This is most likely because the availability of fiscal incentives, such as FiTs and ROCs, meant that there was little commercial imperative on generators to explore such arrangements. Instead, they would enter into shorter term utility PPAs with a licensed supplier, often on standard forms, for the offtake of all of their power as the support payments were sufficient to demonstrate the long term fixed/floor income stream to lenders.

More recently, the rise of wind and solar in the UK and the convergence of a number of market conditions has created the perfect storm for the growth of Corporate PPAs. The closure of the ROC scheme to new participants from 31 March 2017 means that utility scale generators are seeking alternative routes to market. A long term PPA with a credit-worthy corporate offtaker could be the difference between a bankable and non-bankable project. In addition, the ever decreasing cost of generating renewable energy means that a project can be viable without subsidy. In 2019 we saw that Corporate PPA prices were in some cases beating wholesale electricity prices, though this has not been the case in 2020 due to market shocks. As the market continues to re-stabilize, we would expect that from a corporate perspective, Corporate PPAs will

continue to be an attractive prospect to companies who increasingly want to be seen to be acting sustainably and who want to protect against highly volatile electricity prices.

As a result, major corporates playing in the UK Corporate PPA market now include Shell, BT, M&S, EE, Unilever, Mars, Ford, Sainsbury's, Nestle, McDonalds, HSBC, Lloyds and Nationwide.

In addition to this, many more corporates with operations in the UK (including companies such as Unilever, Tesco, Sky, Mace, Virgin Media and the City of London Corporation) are also members of RE 100, the group of companies who have pledged to work towards meeting 100% of their energy requirements from renewable sources.

Despite the UK's established and attractive market for PPAs, 2019 and 2020 have seen a somewhat slower rate of deals being signed than in recent years. There have been very few Corporate PPA deals publicly announced in the UK in 2020. We would attribute this to an uncertain UK investment environment due to Brexit, the market shock caused by COVID-19 and the fact that PPA pricing in the UK is expensive when compared with other countries (meaning corporates prioritise other markets). We expect the market to pick up as corporates continue to focus on green energy buying.

In May 2020, Nestle announced it had signed a 15 year offshore wind Corporate PPA with Ørsted to deliver 31MW per year of electricity from Race Bank offshore wind farm. The deal is Ørsted's second Corporate PPA in the UK (following its February 2019 deal with Northumbrian Water to offtake 23 MW also from Race Bank) and will allow Nestle UK to cover 100% of its power consumption from renewable sources. The UK government also entered the market - in November 2020, the City of London signed a Power Purchase Agreement (PPA) with Voltalia for a 49MW solar farm.

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# United Kingdom



## Corporate PPA Structures in the UK

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. While Marks & Spencer was an early pioneer of the “synthetic” model using a contract for difference type structure across 20 sites, this structure has only become more popular in recent years, with corporates attracted to its comparative simplicity to the sleeved model.

We also seeing a number of new models emerging within the market, or at least being discussed.

These include:

- The “mini-utility” or “supply-lite” model where a corporate sets up an affiliated mini-supply company and becomes the balancing party itself. The generator sells output to the mini-supply company who then sells it to the affiliated corporate under an electricity supply agreement. This model is commonly used in Ireland and is discussed in more detail in the Irish section of this paper (see page 34). This requires significant investment by the corporate consumer in setting up a licensed supply company and gaining the expertise required to manage its own energy supply or outsource this function.

However, the benefit to the corporate is to disrupt the energy supply chain, reducing the number of parties needed to negotiate an energy supply deal and take control of its energy procurement strategy for the long term.

- Building on the “mini-utility” model, Octopus Investments, the UKs largest investor in solar farms, has set up its own licensed supply company, Octopus Energy, offering a range of 100% renewable tariffs to business and domestic customers. Octopus Energy may well be able to procure the power from its own generating assets, disrupting the role of the utilities. This will enable asset owners to offer a simple integrated service to corporate customers.
- The “club” or “consortium” model where small or medium sized companies may begin to take advantage of Corporate PPAs by grouping together to share the risks and enhance bargaining power. This approach has been successfully used in the Netherlands. We think this will be attractive for larger deals such as offshore wind projects. Please see further information on this structure on page 10.
- Blockchain PPAs - please see further on page 12. Blockchain platform providers such as UrbanChain are offering services in the UK.

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# Sweden



*Corporate PPAs have been used for some time and are continuously growing, further advancing an appealing market.*

Wind power investments in Sweden have been built at record pace in recent years and, according to the Swedish Wind Energy Association's (SWEA) prognosis, wind energy production is expected to rise from 25 TWh to 40 TWh within the next three years, meaning that it would correspond to 25% of the electricity use. The target of 18 TWh renewable energy by 2030 is expected to be reached in 2021. Sweden has a target to achieve 100% renewable energy production by 2040 and net zero emissions by 2045. Although production and installed capacity is to double in the coming years, the number of installed turbines will remain around 5,000 and is expected to peak in 2027. SWEA explains that the complicated and uncertain permitting process is a serious obstacle to the development of new wind power.

The joint Swedish and Norwegian support scheme for renewable energy, the Swedish-Norwegian electricity certificate system, is a market-based system, and does not guarantee the owner of the renewable installation a specific price for the power generated. As 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, 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 time period, many corporates also want to show that they are acting sustainably and are contributing to put additional renewable capacity onto the electricity system. However, there are corporates that claim that recent contracts are driven purely by economic considerations.

Furthermore, a recent study found that Sweden has the cheapest average onshore wind PPA prices in Europe.

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

In recent years we have seen more long term Corporate PPAs being entered into in the Swedish market. Large corporates such as IKEA, Google, Facebook, Norwegian aluminium corporates Alcoa and Norsk Hydro, Amazon, and Swedish mining corporate Boliden have all signed Corporate PPAs, and the trend is increasing. Norsk Hydro, which has long been an active off-taker, signed a ground-breaking 29-year PPA including 1.65 TWh wind power per year with Green Investment Group, one of the world's longest and largest corporate wind PPAs in 2018. 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, starting in 2022.

As the support scheme is market based, and as offshore wind is more expensive, so far mainly onshore wind has been developed in Sweden. However, there is now a discussion to enhance the development of offshore wind in Sweden through scrapping the cost for grid connection. Furthermore, we have recently seen some solar PPAs being entered into on the Swedish market. In June 2019, Swedbank announced that it will enter into a Corporate PPA with Eneo Solutions, and be the sole off-taker of what will become Sweden's largest solar PV plant to date, and in July 2019 Swedish bank Sparbanken Skåne entered into a 10-year PPA to purchase one third of the output of a wind farm in Skåne.



*Use of Corporate PPAs has recently increased in Finland and the market is very well suited for them. The new support mechanism being introduced for renewable projects seems to have led to reduced levels of subsidies, meaning that generators have started increasingly to utilize Corporate PPAs in order to hedge against volatile prices and secure a long term fixed price.*

## The new competitive bidding system for renewable energy

In November 2017, the Finnish government published a new legislative proposal (Act on Production Aid for Renewable Energy 30.12.2010/1396) to introduce a new competitive auction system for renewable energy projects. This proposal replaced the old feed-in tariff based support scheme and was accepted with moderations in June 2018 and came into force in September the same year.

Accepted changes permitted wind, biogas, firewood, solar or tidal electricity generators to participate in a competitive process to bid for state-offered subsidies (“premiums”). All bids are considered equal in terms of the technology used and the premiums are awarded to the most cost efficient projects as a result of the competitive bidding process.

The competitive bidding process is now organized by the Finnish Energy Authority subject to a specific budget mandate for each year. The government has set the maximum amount of generation capacity to be

awarded premiums at 2 TWh, which would be awarded from 2018-2020. Due to the relatively small amount of 2 TWh, it is likely that this quota

will be used up rapidly. The auction bidding process is in a form of closed tendering and the premiums awarded is determined based on a generator’s bid for the premium it requires when the market price for electricity is less than electricity’s reference price (30€/MWh). The premium paid will decrease if electricity’s market price exceeds the reference price and will ultimately reach zero during high market prices.

In exchange for being awarded the premium (in addition to the market price for electricity), the successful generators have to produce the amount of electricity they have agreed to in their offer. A failure to do so will result in the generator having to pay the State compensation. A generator’s obligations under the premium system will last for a pre-determined time period and the premiums will be paid for a maximum of 12 years



## Corporate PPAs in the context of the Finnish electricity market

Finland is part of the Nordic wholesale electricity market, which includes the Nordic countries as well as the Baltic countries. The power grids in different countries are interconnected. The Finnish system is in direct contact with the system of Sweden, Norway, Estonia and Russia. According to an estimate made by VTT Technical Research Center of Finland in 2017, by utilising the best wind production sites and the latest technologies, Finland could be producing 300 TWh of electricity annually from wind power, which would be three times more than Finland's current demand for electricity. Due to the interconnected systems it is fairly easy to trade electricity from one country to another. For example a large IT-company has concluded a long term Corporate PPA with a Swedish wind farm for its Finland base premises.

The number of PPAs for renewable energy has increased in recent years. It is also expected for PPA contracts to increase in Finland. According to a report by the Ministry of Economic Affairs and Employment of Finland published in 2019, most wind power projects utilize PPAs. According to The Finnish Wind Power Association (FWPA), during 2018, production of wind power was 5,857 TWh. For example, Google has recently signed three Corporate PPAs in Finland with leading European renewable energy developers CPC, Neoen and wpd. These Corporate PPAs are the first for Google in Europe which do not involve a government subsidy for renewable energy. In 2020, Bird & Bird's team in Finland and UK advised Borealis, a leading provider of polyolefins, base chemicals and fertilizers, on the negotiations of two long term corporate PPA's

with Finnish wind farm operator and developer Ilmatar Windpower.

In Finland no license or permit is required for wind power itself. However, a building permit, granted by the Municipal Building Control Services, is always required when planning a new wind power system.

Usually, wind farms do not require environmental permit in Finland. No permits under Water Act are typically required either, unless the planned wind farm concerns offshore wind power. Wind power turbines over 30 meters high and situated near airports or wind power turbines over 60 meters high elsewhere in Finland require a permit granted by the Finnish Transport and Communications Agency (Traficom), and all the wind farms defined as industrial in size require a permit from the Finnish Defence Forces.

The Finnish Energy Authority must be notified in order to construct an electricity generation plant with an expected capacity of over 1 MVA.

Interconnection to the transmission grid is based on the principle of open and non-discriminatory network access. In accordance with the Finnish Electricity Market Act, a network operator is obliged to connect all generation facilities that fulfil the technical requirements and pay the relevant grid fees.

In order 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 (the so called "chain of open delivery").



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# Denmark



*There is great interest in Corporate PPAs in Denmark. Despite low wholesale electricity prices parity has been reached; the first local PPAs have been concluded and it is expected the market will be booming in the coming years.*

Corporate PPAs are known in Denmark and due to its open economy and the international outlook of Danish businesses many of the Corporate PPAs entered into by Danish parties are related to activities outside Denmark. As a result, some of the biggest and publicly advertised PPAs are physically placed outside of Denmark but with Danish developers or sponsors. Others are foreign data centre owners wanting to operate their data centres with green electricity. However we also see a number of local off-takers entering into Corporate PPAs.

Only a small number of Corporate PPAs have yet been announced officially but we know that there are a number of major Corporate PPAs in the pipeline. One officially announced Corporate PPA is for the offshore wind farm Kreigers Flak, signed between Vattenfall, Novo Nordisk and Novozymes mid-2018.

While there is a lot of interest in Corporate PPAs in Denmark, there are some fundamental issues making the use of them difficult. There are a number of legal issues which are not clarified and hence it is still difficult for financial institutions to provide financing in respect of a Corporate PPA. Work is going on to eliminate or solve these obstructions 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.

The energy policy regarding renewables has changed considerably in recent years. There has never been a stable, long term legislative framework. Instead there

have been a number of changes in fundamental and basic factors affecting the investment into renewable assets. Indeed, the Government has recently announced that it will be introducing new legislation. If such legislation 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 and the climate challenge was a key topic in the 2019 elections. In the 2018 Energy Agreement the ambition to achieve 55% of renewable energy share by 2030, a complete phase-out of coal by 2030 and a fossil fuel free energy supply by 2030 was concluded as a broad political agreement. Wind has dominated the renewable energy generation in Denmark for many 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 solar projects are increasingly being completed. Biomass has been, and is still, popular. It is certain that solar projects may be the most suitable vehicle 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). There is growing pressure on corporates to act sustainably meaning that companies will consider these solutions even though they may not financially be their best investment case.



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# The Netherlands



*Corporate PPAs have shown to be an excellent instrument to raise the sustainable profile of corporates and create price predictability. Innovative structures now also allow smaller corporates to benefit.*

## Dutch regulatory environment

The EU has set targets for renewable energy generation, the reduction of CO<sub>2</sub>- emissions and measures to halt global warming for its member states. The climate goal targets for the Netherlands are extremely ambitious and until now the Netherlands is struggling to meet the goals. To reach its goals for 2020, it had to strike a deal with the Danish government as it failed to reach its (inter)national goals for renewable energy production.

The Dutch government has implemented a variety of measures and regulations to support investment in renewable energy projects such as an updated SDE++ (Stimulation of Sustainable Energy Production) regulation and the EIA (Energy Investment Tax-reduction). From 1 January 2020, the new SDE++ is in force replacing the earlier SDE+ system. Subsidies under the SDE++ system are calculated against reduced emissions rather than as per the SDE+ system, per generated kWh electricity. In addition to the SDE++, companies investing in renewable energy and energy-efficient technology may also be entitled to the EIA, which allows companies to deduct 55% of the investment costs from the fiscal profits, on top of any permitted depreciation. Despite these regulatory changes and a favourable investment climate, the Netherlands is still lagging behind in achieving its climate targets. However, change might be on its way as large quantities of PV panels are being installed in dedicated ground-mounted solar parks as well as on rooftops, both onshore and offshore wind parks and significant investments in hydrogen facilities are underway.

## 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 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.

## 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. As is typical 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 certainly help to fill this void. A long term PPA with a credit worthy corporate counterparty that has a stable pre-agreed 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.

## Corporate PPA structures in the Netherlands

Mandatory unbundling requirements in the Netherlands mean it is possible for a generator and a corporate consumer to enter into a Corporate PPA without needing a utility to enter into a “back-to-back”

# The Netherlands

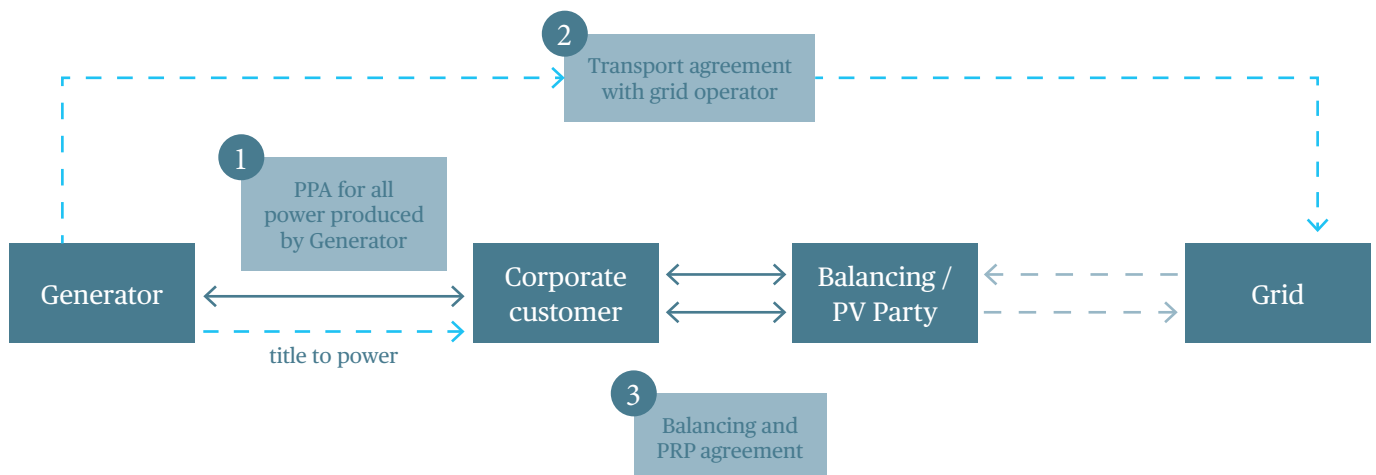


PPA with the corporate consumer. This is because the “sleeving” of the energy is done by the grid operator, rather than by the utility. Rather than entering into a “back-to-back” PPA with a utility, the corporate consumer can transfer its program responsibility to a trading or balancing party, thereby reducing costs of its energy consumption.

An increasing number of Corporate PPAs are being concluded in the Netherlands. 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 to this, utilities such as Eneco are becoming increasingly active in the renewable market. They co-invest in renewable energy projects and/or contract large quantities of renewable electricity and on sell this to their customers. These structures provide the utilities with the economic certainty to keep re-investing in new renewable energy projects.

## Offshore windparks

The tenders for the Dutch offshore wind farms have been very successful with two of the tenders resulting in subsidy free projects. The winning bids of these tenders are all backed with long term (corporate) PPAs securing the financing of the projects. Once all planned offshore wind farms are being built and become operational, it is expected that the Netherlands will be able to meet its sustainability goals.



*Corporate PPAs could be used successfully in Spain to stimulate the development of new renewable projects. However, certain market barriers have so far prevented their widespread use.*

Since 2013, the main support mechanism for renewable generation in Spain entitles generators that export power to the national pool to earn a “reasonable return” which is calculated by reference to the average return in the secondary market of 10-year Spanish government bond. To achieve this they are paid a “specific remuneration” on top of the market price that they receive for the electricity from the CNMC. However, the legislation allows the government to review and amend the specific remuneration every six years.

In this sense, Spanish Royal Decree 17/2019 dated 22 November (“RDL 17/2019”) established a reasonable return for the regulatory period 1 January 2020 - 31 December 2025 of 7.09%, reducing the previous reasonable return for regulatory period 2013-2020 that was 7.398. However those installations with premium retribution before 2013 have the possibility to keep receiving the prior reasonable return, i.e. 7.398 instead of 7.09. It is important to highlight that in order to reduce the number of international arbitrations initiated against the Kingdom of Spain since 2013 due to the change of the former energy regulatory regime, RDL 17/2019 prevents the companies that have started an arbitration proceeding from receiving the 7.398 reasonable return unless they terminate the arbitral proceeding or renounce to the outcome of the proceeding before 30 September 2020.

The last two auctions held in May and July 2017, which awarded a total capacity of 3,000 MW to generators, have shown that an unsubsidized renewables market is gradually becoming a reality without the need for any additional specific remuneration. While this removes the uncertainty of the level of specific remuneration that a project would receive, it would still leave a project exposed to volatile electricity prices that could go up or down, again negatively affecting the length of financing terms available.

## Climate Change and Energy Transition Law

On 19 May 2020, a new Climate Change and Energy Transition Law was submitted to the Spanish Parliament. This bill sets the following objectives for 2030: a 20% reduction in greenhouse gas emissions with respect to the 1990 level; to achieve 35% renewable energies in final energy consumption; and to achieve an electricity system with at least 70% of generation from renewable energies.

A climate-neutral (zero net emissions) target is set for 2050, as well as an electricity system “based exclusively on renewable sources of generation”. In addition, the Council of Ministers is entitled to upwardly revise the targets to both 2030 and 2050, in order to comply with the Paris Agreement, European Union (EU) regulations, technological developments, or for other reasons, whether environmental, social or economic.

These objectives will be achieved with the National Integrated Energy and Climate Plans (PNIEC) and the “Decarbonisation Strategy to 2050”. The PNIEC 2021-2030 defines a series of intermediate targets for the share of renewable energy, setting it at 24 % by 2022 and 30 % by 2025. This means that renewable electricity generation will have to increase, according to the data in the plan, by around 2,200 ktoe in the period 2020-2022 and by around 3,300 ktoe in the period 2022-2025, which will require a rapid increase in the power of the generation pool from renewable energy sources. In the period 2020-2022 the renewable park should increase by approximately 12,000 MW and for the period 2020-2025 by approximately 29,000 MW, of which approximately 25,000 MW correspond to wind and photovoltaic technology. The PNIEC 2021-2030 is currently being processed.

Following the European Commission’s report, it has been submitted to public environmental assessment



information, a proceeding that concluded on 11 June 2020. After the environmental assessment process has been completed, the proposals received will be evaluated and the PNIEC will be sent back to Brussels.

In order to achieve these objectives, the recent Royal Decree Law 23/2020 has empowered the government to establish, by means of regulations, a new remuneration framework for the generation of electricity from renewable energy sources, based on the long-term recognition of a fixed price for the energy.

The aforementioned remuneration framework will be granted through competitive bidding procedures in which the product to be auctioned will be the electrical energy, the installed power or a combination of both and the variable on which it will be offered will be the remuneration price of such energy.

A long term Corporate PPA with a fixed price would help to solve both of these issues and allow lenders to offer longer tenures of debt. In addition to this, there are several other factors that would support the growth of Corporate PPAs in Spain. This includes:

- the price on carbon emissions is putting upward pressure on electricity prices meaning consumers may be more willing to enter into a long term fix;
- large corporate (and progressive smaller corporates too) are committing to use renewable electricity;
- there some renewable projects that are no longer

entitled to receive specific remuneration as they would have reached the reasonable rate of return established by the government as a condition to receiving; and

- there are renewable generators that are looking for potential alternatives outside the specific remuneration support scheme.

## Recent Corporate PPAs in Spain:

The aggregate volume of Corporate PPAs announced in Spain up to Q1 2020 exceeded 6 GW. This figure has grown in recent months due to the increased interest in this type of agreements in Spain. Examples of some of the most important agreements reached during the last year are Acciona with Telefónica (a 10-year-term agreement with an annual supply of 100 GWh), Engie with Fortia Energía (a 11-year-term agreement with an annual supply of 400 GWh), Sonnedix with Statkraft (a 10-year-term agreement with an annual supply of 100 GWh), Iberdrola with Orange (a 12-year-term agreement with an annual supply of 100 GWh) or EDP with Royal DSM (59 MW).

Additionally some energy companies such as Engie are offering PPAs as part of their services in Spain with the potential buyer adhering or slightly negotiating to such PPA.

However, there are still a number of barriers to overcome in order to unlock the Corporate PPA market in Spain:



- **Term of the PPAs.** Long term certainty of revenue is vital in order to construct, develop and finance a renewable project. At present corporates are reluctant to sign up to long term PPAs with fixed prices. However, this should change as the rationale behind this thinking is more a matter of inertia and historical practices.
- **Guarantees and identity of the off-taker.** Identity of the off-taker and its credit rating are very important for the generators as well as for the financing entities. As most of the off-taker does not have enough credit rating, they are required to provide strong payment guarantees.
- **Price of the energy.** While a fixed price under a Corporate PPA provides a generator and a corporate with certainty and a hedge against market volatility, some corporates will be wary to sign up to a long term Corporate PPA if they think there is a possibility that spot power prices will reduce in the future. Traditionally, corporates have preferred to agree power prices year by year and so company boards are not accustomed to assuming the risk of a fixed price over a long term.
- **Regulatory burdens.** The Spanish Energy Act 24/2013 expressly contemplates renewable generators and corporates entering into Corporate PPAs as an alternative to selling and buying electricity on the spot market. However, in order to do so, the parties to a Corporate PPA would have

to comply with certain regulatory requirements to supply information about the contract to the Spanish market operator and the Spanish regulator. This includes notifying the market operator on a daily basis of the electricity supplied and consumed pursuant to the Corporate PPA. This information must be provided to the market operator by a regulated market agent. Generators will typically have to subcontract this service to a professional market agent (usually supply companies provide this type of services) and the fees for such service would have to be built into the Corporate PPA. Additionally, corporates would still have to enter into a contract with the network distribution company in order to pay the necessary grid access charges to take the power from the renewable generator. These additional costs could make a Corporate PPA a less attractive prospect to a corporate (or a generator if the corporate is not willing to pay these additional costs). Finally, the Spanish Energy Act 24/2013 grants the Ministry of Energy power to further regulate bilateral agreements for the sale or purchase of electricity, including Corporate PPAs which may impose additionally regulatory burdens in the future.





# Portugal



*Due to its benefits, Corporate PPA's are beginning to gain prominence in the Iberian space, supporting the expansion of renewable capacity. There are, however, a number of barriers still to overcome.*



## Portuguese Renewable Energy Legal Framework

Portugal has been consistently supportive of renewable energy generation, especially through encouraging legal regimes that have guaranteed and protected investment and the acquisition, by the supplier of last resort, of the electricity generated.

In fact, one of the national goals for the 2030 horizon is the reinforcement of the bet in renewable energies and the reduction of the energy dependency. The recent approval of the National Energy and Climate Plan 2021-2030 (PNEC 2030, in its Portuguese acronym) 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 decarbonization of society and the promotion of the gradual introduction of hydrogen.

According to PNEC 2030, Portugal is the third country of the European Union with the highest level of renewable incorporation. This is the result of abundant natural resources but also of the overall legislative and regulatory stability over the last decades and of public policies that have fostered renewable energy projects since the 90's. Such policies have relied mainly on the approval of public remuneration schemes that guaranteed stability and long-term predictability of return to private investors.

In particular, electricity production in renewable energy plants registered in Portugal until 7th November 2012 is promoted through a feed-in tariff. Since that year, no guaranteed remuneration scheme has been approved for new projects in Portugal, other than for small-scale, self-consumption or renewable cogeneration projects and therefore, renewable projects in Portugal:

- Either benefit from a feed-in tariff granted prior to 2012, selling energy, through a power purchase agreement (PPA), to the supplier of last resort, which is legally obliged to acquire such energy, paying special regime generators the feed-in tariff that corresponds to their generation technology and the date of licensing; or
- were licensed after 2012 and thus, operate under a market regime, selling energy under organised markets or through bilateral agreements.

Nonetheless, in this new world of sophisticated technologies, the reasons for supporting renewable energy generation have not diminished, but only grown bigger, given that a few years ago, a rampant interest in the deployment of solar energy in Portugal emerged. In fact, most renewable investment in Portugal has traditionally focused on the wind and hydro sectors, leaving solar energy overlooked. However, Portugal has recently witnessed a significant increase in capacity licensing requests for solar energy projects, which has resulted in a shortage of grid capacity.

For that reason, on 6 June 2019, the Portuguese Government launched an auction to grant grid capacity in which each participant submitted proposals either 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 being in place for a period of 15 years. Largely due to the success of such auction, photovoltaic production has exceeded, for the first time, the annual mark, with 1,400MW allocated and a world record of 14.80€ per MWh reached. The 2020 solar auction proved also a success with Portugal breaking a new world record with the lowest price of solar energy recorded. The auction was awarded 670 megawatts (MW), of which around 75% in storage mode (483 MW), a third bidding



modality that was newly introduced.

More recently, a new legal regime for both collective self-consumption of renewable energy and renewable energy communities was established, according to which the producer no longer relies on the supplier of last resort to sell excess energy from the UPAC and must trade such energy under an organized or bilateral market, through market participants against the payment of a price determined by the parties, or through the market aggregator.

Currently, the strategy for the Portuguese energy sector relies heavily on the installed capacity of renewable energy generation projects while the country prepares the decommissioning of the coal power plants and boosts private investment in renewable energy projects by launching competitive bidding procedures that bring support schemes closer to market prices and invests in the expansion of grid capacity to allow the connection of said projects.

## 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.

However, stakeholders are exploring alternatives in Portugal. Portugal's regulatory and legal framework allows the use of different mechanisms for the active purchase of electricity by the consumer, the main ones being Renewable Energy Certificates, PPA's and production for self-consumption.

In fact, several players are venturing into the new world of the so-called 'virtual PPA's', as a way to mitigate the price volatility risk of spot-market sales and increase cash-flow stability. A virtual PPA is a power-purchase agreement with no physical delivery of electricity to the off-taker, under which the electricity is sold in the spot market and the floating revenue is exchanged by the generator against fixed payments from a corporate off-taker.

Due to its benefits, Corporate PPA's are beginning to gain prominence in the Iberian space, supporting the expansion of renewable capacity. In Portugal, some examples are: Sakthi, which has 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 (fixed prices of 8 years for the energy produced in the Solar Power Plant located in Salvaterra de Magos (24MW)); Allianz Capital Partners and WeLink (a 20 year agreement regarding the Ourika solar power station); the Vale do Moura Photovoltaic Plant (28,8MW) also signed by Axpo and Hyperion Renewables with a 10 year marketing guarantee, being the first bank-financed photovoltaic plant in the whole Iberian Peninsula which will not receive any type of public subsidy.

Corporate PPA's guarantee new installed renewable capacity and allow the financing and, therefore, the installation of more renewable photovoltaic and wind power plants without any kind of influence of the electricity tariff on the price.

There are, however, a number of barriers still to overcome. On the one hand, REN, the grid operator, faces a huge challenge in accommodating so many new solar generators - with regions such as Evora and Estremoz already seeing bottlenecks. So much so, that, in 2018, the government has put in place a lottery scheme (sorteio) to award future permits for areas where grid lacks capacity. The high number of photovoltaic plants without a subsidised tariff already approved by the government plus pending licence applications exceeded, in some network areas and on a large scale, the reception capacity in the national electricity distribution and transmission network.

Additionally, clarifying the regulation would also be crucial to freeing up investments in new green capacity, given that there are several aspects of the legislation and regulation of Corporate PPA's that are still not clear and remain quite ambiguous, namely pertaining to the taxes levied on power generation.

Indeed, the renewable energy sector needs a cohesive strategy that offers a fair energy transition to society with cost reduction, but also promotes a sector that generates sustainable value chains, to which the development of the Corporate PPA's market in Portugal can contribute to a great extent.



*In Italy we are entering a new era where generators and off-takers will soon be able to take advantage of new developments in the PPA legislative and regulatory framework.*

Towards the end of the last decade, the Italian renewables market entered into a period of rapid growth and transformation. This was due not only to the country's favourable climate but also, and mainly, to a legal framework known as "Conto Energia" which provided economic support to the renewable energy sector through the "feed-in-tariffs" scheme. This scheme provides a guaranteed payment for electricity generated and exported by PV plants to the grid. Italian legislation grants generators the option to sell electricity, either through a mandatory purchase regime (ritiro dedicato), through bilateral agreements (PPAs) or on the electricity exchange market.

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, whereby 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 (usually electricity generators on large scale) to explore how to increase their revenues by selling electricity power generated by their plants. PPAs are hence a valid alternative for generators to the mandatory purchase regime.

PPAs in Italy are bilateral contracts executed "over-the-counter" at a purchase price directly negotiated with energy traders/wholesalers, which in turn 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. Although no regulatory provisions prevent parties from entering into long-term Corporate PPAs, Corporate PPA structures have not yet been explored in Italy. However, corporates are starting to look at them with increasing interest due to sustainability and CSR aspects becoming increasingly important, and because they can provide a direct economic benefit in the background - for instance in terms of access to green bond financing.

In particular, thanks to the ESG procedure to be enacted by corporates, we have noted in recent months an increase in Corporate PPAs requests, resulting in 2 different auctions launched by 2 large TMT corporations to secure the energy needed for maintaining its assets in Italy.

The COVID-19 outbreak has unfortunately originated a “stop and go” to the energy transition’s acceleration started in early 2019, due to the drop in energy demands and to the electricity price curve forecasts until 2024. Notwithstanding that investment in renewables are considered on a long-term return basis,

risks associated with merchant price off-taker default are not helping in creating a healthy environment for foreign investors looking at the green Italian peninsula.

We are currently entering a new era where generators and off-takers will soon be able to take advantage of new developments in the legislative and regulatory framework that governs Corporate PPAs which were introduced in August 2019 and are expected to be further supplemented in 2020/21. In this respect, the Italian Government, in addition to enacting a public platform to facilitate matching demand and supply of PPAs, is also expected to agree to a change in regulation to provide tax relief to corporates buying green energy, and/or to provide a form of guarantee to parties entering into long term PPAs in order to encourage their uptake and drive growth in the market, in line with trends seen across other parts of Europe.



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# Germany



*Corporate PPAs are currently on the rise in Germany. First PPAs have been concluded, significant growth is expected in the coming years.*

In Germany, Corporate PPAs are widely seen as the next “big thing” in the renewables market. The first PPAs for operational projects were concluded in mid-2018, setting the scene for more PPAs to be entered into in the future. At the end of 2019, Covestro and Ørsted concluded the first German greenfield offshore wind PPA - the world’s largest offshore wind PPA at that time.

At the end of 2020, there will be a total of approximately 4.5 GW of onshore wind capacity (and thereafter, an average of 2.5 GW of onshore wind capacity per year) which will no longer be eligible under Germany’s support scheme. By 2026, this will apply to approximately 17 GW or one-third of the currently installed onshore wind capacity in Germany.

It is expected that the Corporate PPA development within the next years in Germany will be driven to a large extent by such operational projects phasing out of the support scheme. A good example to illustrate the possible use of PPAs in this context is a PPA deal concluded in Q3/Q4-2018 with a major German car manufacturer. As of 2021, it will source electricity from a clustered sleeved PPA of multiple operational wind parks to supply its manufacturing sites (46 MW, term of 3 to 5 years). These wind parks will all phase out of the support scheme by the end of 2020.

Furthermore, due to the recent major decline in levelized cost of energy (LCOE), the numbers of Corporate PPAs with greenfield projects will also pick up. This trend is demonstrated by the first long-term solar PPA concluded in 2019 (85 MW, term of 15 years).

The current effect on power prices due to COVID-19 is expected to remain a short-term singularity.

The fact that Corporate PPAs have not been on the rise in Germany earlier can be attributed to the attractive support scheme for renewable energy that has been in place for a number of years. This support scheme used to pay a so-called “market premium” which was based on a statutory reference price for a 20-year subsidy period.

Under this regime, it was financially more attractive for generators to make use of the German support scheme, since it granted a guaranteed price above market prices compared to entering into PPAs with corporates as off-takers. On the other hand, corporates have generally chosen to enter into traditional (“brown”) electricity supply agreements that include certificates of origin of other renewable sources (e.g. Norwegian hydro). Using this, corporates have been able to buy “green energy” for a fixed price. In addition, German energy regulation does not allow to issue and sell certificates of origin for renewables benefitting from the support-scheme. Consequently, to enter into PPAs with such supported projects has not been an option for corporates when sourcing green energy.

However, the scene is now rapidly changing. Amendments to the Federal Renewable Energy Act in 2017 triggered a shift away from the statutory reference prices to reference prices that are set by competitive auctions for wind and solar generators. As in other countries, the auctions have resulted in lower reference prices being awarded. Furthermore, the auctions have put pressure on the supply chain, leading to a major reduction of the LCOE. On the other hand, market prices are expected to rise within the next years. All of this will make long-term Corporate



PPAs with a fixed price a far more attractive option for generators as well as for corporates, mostly due to price certainty for both parties and potential cost savings for the corporates.

There are a number of scenarios for how Corporate PPAs can be implemented into the German market:

1. renewable generators that currently receive the statutory or auction-based “market premium” enter into a Corporate PPA;
2. renewable generators that are no longer eligible to benefit from the German support scheme (e.g. after the expiry of the 20-year subsidy period) enter into a Corporate PPA; and
3. renewable generators voluntarily waive their right to participate in the German support scheme and conclude a Corporate PPA instead.

Scenarios (1) and (2) apply to operational projects only, whereas scenario (3) is relevant to both operational and newly built projects.

In scenario (1), the renewable generator would not be allowed to sell any certificates of origin that are associated with the renewable power to the corporate because it is not able to do this and claim the market premium in respect of the same electricity. However, it should be clarified that scenario (1) is, in all other aspects, legally permissible. Nonetheless, for most corporates, the lack of certificates of origin may eliminate the reputational benefit of entering into a Corporate PPA. However, a Corporate PPA could still be attractive for corporates that want to hedge their power price risks. Scenario (1) is only an option for off-site sleeved and synthetic Corporate PPAs, but not for on-site Corporate PPAs, as to receive the market premium, the electricity generated must be exported to the grid.

In scenarios (2) and (3), it is possible for renewable generators to enter into a Corporate PPA and to also sell certificates of origin that are associated with the renewable power to the corporate. As set out above, in light of the reductions in the reference prices awarded to renewable generators at auction and the reduction to the LCOE, the conclusion of a Corporate PPA is expected to become a more attractive option for renewable generators financially. In addition, newly built projects in scenario (3) may be more attractive due to the fact that they would be subject to fewer legal hurdles by not taking part in the auction process and not being bound by the statutory annual maximum capacity volumes.

Germany is currently in the process of implementing the Renewable Energy Directive (RED II) into national law, including its Renewable PPA friendly approach. However, as of August 2020, the German legislator has not yet proposed any policies and measures facilitating the uptake of PPAs. The same applies to any assessment of regulatory and administrative barriers to long-term PPAs. The legislator plans to address these issues after the summer break from September 2020 on, having in mind the transposition period stipulated in the RED II directive as of 30 June 2021.



*Corporate PPAs are currently surging in France. Decreasing tender prices, projects leaving the support scheme and the need for companies to green their energy mix make the French market mature.*

At the end of 2019, France ranked 6th on the European market for photovoltaic corporate PPAs, and the tendency is rising (the 200 MW line of photovoltaic capacity marketed under PPAs was crossed in February). This tendency is also notable for onshore wind projects - Boralex Europe announced for example in July 2020 that it intends to increase tenfold the volume of wind power marketed through PPAs in France.

There are three major reasons driving the PPA market forward in France: Projects leaving the support mechanisms (1), decreasing tender prices (2) and growing commitment to green power procurement including the guarantees of origin (3) contribute to the widening appetite of companies and producers for corporate PPAs.

(1) Generation of electricity from renewable energy sources has initially been promoted - since 2000 - through a legal "Feed-in Tariff" (FIT) mechanism. According to this mechanism, EDF had the obligation to offtake the entire electricity produced by renewable energy projects falling within the scope of the support mechanism for a fixed (and then indexed) price and for a duration of 15 years. This support system has been modified for the respective energy sources during recent years to introduce a direct marketing scheme with Contracts for Difference (for up to 20 years for smaller projects falling under the 2017 support mechanism). Already in place for solar projects, a tender procedure was also set up for onshore windfarms in 2017.

As from this year, 500MW/year of wind turbine installations will come out of the original FIT support mechanism. As repowering is not easily feasible for all projects and as lifetime -span for the installations is increasing, producers are interested to value of their production by signing short term PPA's. In line with this, Boralex concluded in July 2020 a 5-year PPA with French Telecom Orange (39MW, onshore wind). In addition, 2 of the 13 wind farms operated by Eurowatt and Boralex will remain in service after the end of the FIT support mechanism until December 2023 to supply the produced electricity to Auchan Retail France stores and warehouses. In such short term PPA's the buyer does not have to undertake any long-term commitment with respect to energy prices and can carry out an experimental phase.

(2) More and more generators voluntarily don't apply for support mechanism and enter instead a Corporate PPA: either by avoiding a tender procedure and/or by assuming falling tender prices. For example, the average price of the bids selected in the first wave of the 2019 onshore - wind tender was 66.9 €/MWh and dropped to 62.9 €/MWh in the fourth tender in 2020. The decrease of photovoltaic electricity tender prices is even more important. In order to take into account the COVID situation for the solar sector, a decree dated June 30, 2020 limited further reduction in tariffs to 2.7% for the third quarter of 2020 (for smaller projects).

PPAs protect the subscribed volume from market volatility and provide project owners with a long term



price stability required to obtain project financing at the best price. Thus, long durations for those contracts are becoming more common, such as the 21-years PPA signed between Urbasolar, GazelEnergie and Aéroport de Paris (ADP) in February 2020 (solar, expected production: 47 GWh/an) or the 20-years contract which RES has signed with SNCF Energie in June 2020 (39 MW, solar), following a PPA concluded between the same parties in 2019 for 143 MW and a 25 years duration. As another example, Engie will sell the electricity produced by the Fanjeaux photovoltaic solar farms (18 MW), exclusively via PPAs to the group's local authority, tertiary and industrial customers.

The ambitious renewable energy procurement strategy via PPAs has now reached all major actors as La Poste (tender procedure) or French Telecoms Orange.

(3) Auchan Retail France has made a 20-years commitment to Voltalia to build two new solar parks (61MW, solar) ensuring a stable supply of Guarantees of Origin (GO) at a fixed price and from an identified farm, in application of its local procurement policy.

The firm prefers to buy these certificates directly through a PPA rather than on Pownext. On this market, buyers place orders there in the form of a region/technology pair, but their issued preference for a particular installation is not guaranteed. In addition, the price of certificates of origin is subject to market volatility (Weighted Average Price GO onshore wind turbine New Aquitaine 0.38 €/MWh in March 2020 compared to 0.19 €/MWh in April 2020).

While PPAs may be less economically relevant today than in other countries, in particular because of the cost of electricity, it is nonetheless clear that they are now a pillar in power purchasing strategies of industrial energy consumers in France. However it's in particular the bigger actors who are currently on the driver's seat, being able to procure more easily financial guarantees with respect to offtake or procurement risks, in particular with respect to project finance requirements.



*Following recent developments, the Irish Corporate PPA sector has been the subject of significant interest from both public and private actors in the Irish market.*

Matheson

Whilst we don't have Bird & Bird offices in Ireland, we work closely with leading law firm Matheson on renewable energy projects in Ireland. Matheson have the market leading and largest dedicated Energy practice in Ireland and have excellent experience on Corporate PPAs and set out here for us some commentary on the Irish Corporate PPA market.

Renewable energy generators in Ireland have historically benefitted from a generous feed-in tariff scheme from the Irish government - the Renewable Energy Feed-in Tariff (REFIT). The availability of REFIT has offered very little incentive for generators to consider Corporate PPAs.

Nonetheless, the first Corporate PPA to complete in the Irish market was in fact a 'REFIT-supported' Corporate PPA between GE and Microsoft in October 2017. This Corporate PPA allowed Microsoft to purchase the energy produced at a 37 MW wind farm in County Kerry.

The Microsoft Corporate PPA helped to catalyse interest in the Irish Corporate PPA market and a significant milestone was achieved in April 2019 with the announcement of the first unsubsidised Corporate PPA in the Irish market between Amazon and an independent renewable developer in relation to a proposed 91MW wind farm in County Donegal. This was closely followed by an announcement by Amazon in early August 2019 that it had entered into a further unsubsidised Corporate PPA in relation to a proposed 23MW wind farm in County Cork.

Most recently, Facebook and Brookfield Renewables announced in August 2020 that they had entered into a Corporate PPA in respect of a proposed 28.8MW wind farm in County Tipperary. A further 2 Corporate PPAs have been concluded in Ireland recently (but have not yet been announced). The Matheson team has advised on all of the Corporate PPAs in the Irish market to date.

The Irish Corporate PPA market was initially expected to adopt a "supplier-lite" model (successfully used

in Ireland for over ten years on REFIT projects). This model involves a corporate setting up a licensed supply company. Under a supplier-lite Corporate PPA, the generator sells the power (and transfers the renewable accreditations - GOOs) to the corporate supply company who in turn sells it to the end-user corporate under an electricity supply agreement. In this structure, the corporate is likely to outsource the balancing, forecasting, market integration and trading functions to a third party service provider.

However, we have also recently seen other Corporate PPA structures used - including:

- "Sleeved PPA" structures where power is sold by the generator to the corporate consumer via PPAs entered into by both parties with a third party "utility"; and
- "Synthetic or Virtual PPA" structures where the generator and corporate enter into a contract for difference (CfD) under which the parties lock in the fixed strike price for the sale/purchase of power (and we are expecting the vast majority of Corporate PPAs in Ireland going forward to be virtual PPAs).

The critical question for the Irish Corporate PPA market at the moment is what impact the recent Renewable Electricity Support Scheme (RESS) auction will have. Provisional results for the first RESS auction were announced on 4 August 2020 with the average 'strike price' coming in around the €74/MWh mark (note that this amount is non-indexed for the approximately 15 year support term). At this price, it may be difficult for Corporate PPAs to 'compete' for projects but this could change in the coming years with future RESS auctions.

In any event, the Irish Government's "Climate Action Plan" sets a target of 15% of all electricity demand being met by Corporate PPAs by 2030. The Government will have to consider and implement policies to achieve this ambitious target and it will be interesting to see what form these policies take.





*High electricity prices for industrial off-takers, expectations of meeting strict sustainability criteria at the demand-side, and declining prices obtained through the CfD auctioning scheme (at least in the case of wind and solar projects) make energy market participants eager for measures that would stabilize mid- and long-term electricity prices and alternative sources of project bankability. Only business cooperation can lead to a win-win situation, and so a growing number of PPAs are being concluded on the Polish market.*

Wholesale electricity prices in Poland are currently among the highest (at times even the highest) in the whole EU. What is more, the prices continue to climb due to factors of a long-lasting nature. The structure of what is known as the merit order as a wholesale price creation mechanism, and the extent to which it is affected by the prices of emission allowances, are of the utmost importance. Several other factors also need to be noted: the electricity system's lack of elasticity, limited competitive pressure on electricity prices from neighbouring electricity systems, regulation-based cross-subsidizing and tariffication of electricity sales to households, and the very limited commercial availability of interconnector capacities, to name just a few.

As well as having to face high black energy prices, Polish industrial off-takers must also cope with new public burdens and regulatory overheads, such as the new capacity fee that began to be charged on 1 January 2021. In these circumstances, large electricity off-takers are looking for opportunities to optimize electricity prices and secure at least part of their annual consumption at a price that is acceptable in terms of their long-term financial planning. Limitations of their carbon footprint, the implementation of sustainability strategies and the growing expectations of contractors in supply chains that their business partners will meet the current environmental, social and governance (ESG) standards can be understood as additional incentives.

As far as renewable energy investors and installation operators are concerned, due to the gradual phasing out of public support systems (auctions under the current CfD-based scheme will be organized until the end of 2021; a draft act postponing that date up to the end of 2027 is currently at an early stage of the legislative procedure) those entities are beginning to seek alternative sources of bankability for their projects. Even taking into consideration that the current scheme may be prolonged, it is very likely that the amount of electricity generated in large PV and wind sources that can get covered by CfD contracts via auctions (determined for subsequent years by ordinances of the Council of Ministers) will slowly decrease. The same is true for the reference price level for auctions involving these kinds of renewable sources.

As the prices obtained through auctions for CfD (especially by wind and solar power sources) gradually become less attractive from one auction to another, investors and operators have started to seek an alternative basis for project bankability. It seems, however, that Polish financial institutions must adjust their standards of bank acceptability for different types of PPA contracts, with a noticeable trend towards giving priority to CfDs.

The first PPAs (whether settled physically or financially) were concluded in Poland in 2018 / 2019. Since then, interest in PPAs has grown steadily,

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# Poland

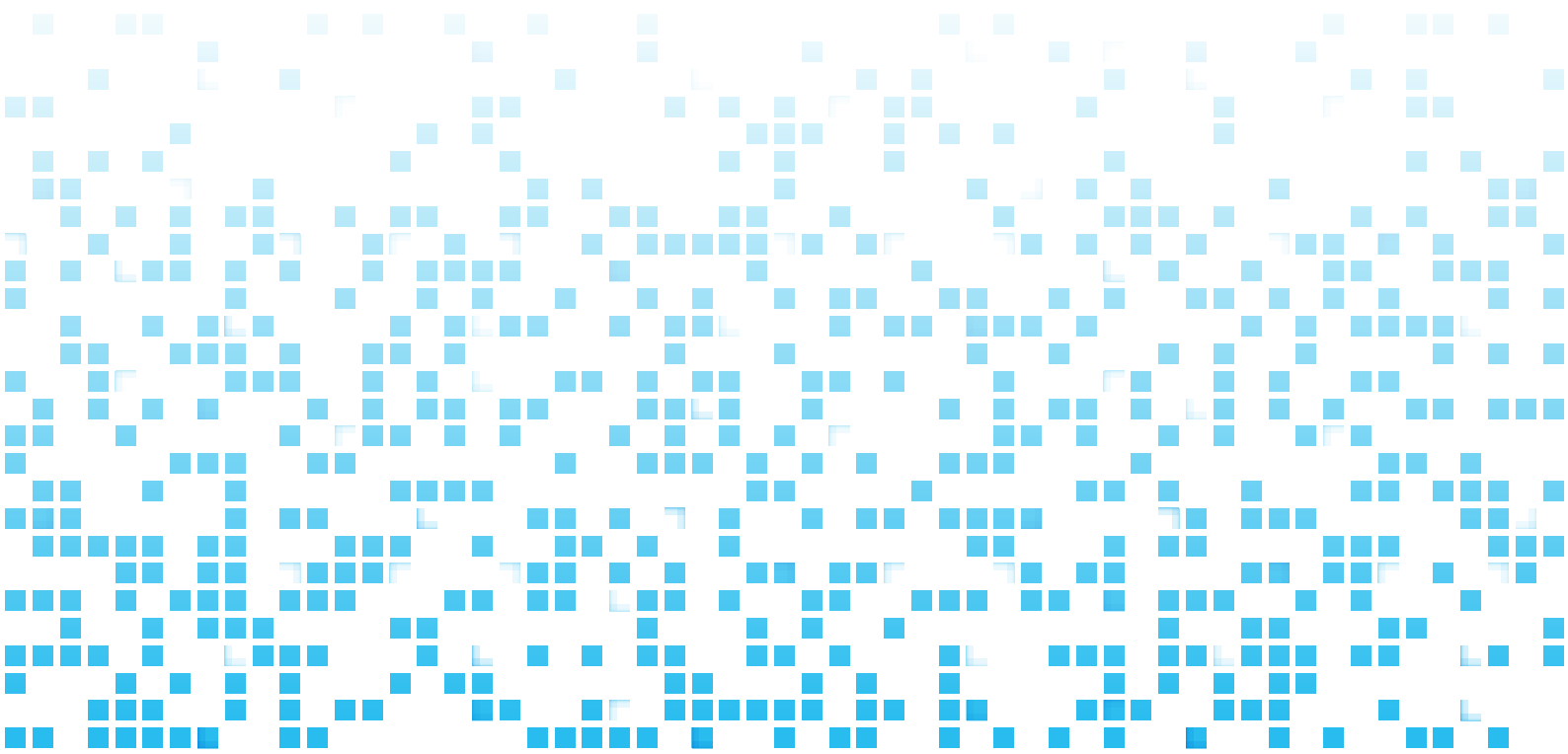


especially with regard to structures where, in addition to the electricity producer and the off-taker, there is another entity (most commonly an energy trading company) responsible for offering a sleeved product. This entity is responsible for commercial balancing between the commercial and acts as technical operator for both - the generating unit and the energy consumer participating in such a structure.

An additional reason for the popularity of sleeved products is that Polish regulatory environment lacks effective implementation of transparent criteria for approval of the private-wire, what makes the conclusion of direct off-site Corporate PPAs (performed outside of a distribution network) virtually infeasible. This situation, however, should change after the anticipated implementation of the RED II Directive to the Polish legal system.

As mentioned above, the main motivations for the phenomena on the demand side include a need to optimize costs and/or hedge and meet strict standards in terms of sustainability and ESG criteria, despite the highly carbonized character of the Polish electricity generation mix.

The vast majority of our international clients, whether from energy-intensive sectors or focused on reaching certain targets rooted in the low-emission economy, are currently considering concluding Corporate or Virtual PPA agreements. It does seem that the market for such cooperation will soon be booming.







## *The new renewables support scheme may result in an upswing in the application of Corporate PPAs in Hungary.*

The conclusion of Corporate PPAs has not been a widely used practice in Hungary. The main reason for this was on the one hand that electricity generators from renewable sources had to sell all of the electricity they generated to the Hungarian TSO, MAVIR, in order to benefit from the feed-in-tariff based state subsidy system, KÁT. On the other hand, 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. Companies with an agenda for sustainability and environmental responsibility therefore had the opportunity to purchase certificates of origin without necessarily having to directly conclude a PPA with the renewable generator.

As of the beginning of January 2017, the state subsidy of new renewable generation capacity of over 0.5 MW was introduced (generally referred to in Hungary as the “METÁR system”). In the METÁR system, the RES generators receive the subsidy as a paid premium over the market reference price, the latter being based on specific day-ahead prices of the Hungarian Electricity Exchange, HUPX. The only exception is RES power plants below 0.5 MW, which had the option to receive a feed-in-tariff, but applications for this subsidy were closed on 27 April 2018. Therefore, with the introduction of the METÁR system, the renewable generators have to go out to the market and conclude PPAs with customers (or traders) that may give rise to a growing number of Corporate PPAs.

Corporate PPAs may also be a way to go for those renewable generators whose eligibility to benefit from the KÁT system expires. These generators will have to make a dire shift in their business model and

handle the risk of price volatility, for which a long-term Corporate PPA may very well be an attractive solution.

Further, for projects that do not or would not want to qualify for state subsidies, Corporate PPAs can be an important factor in the bankability of the project for financiers.

Currently, corporates such as the Hungarian subsidiary of Coca-Cola meet their self-imposed sustainability targets by purchasing certificates of origin rather than entering into Corporate PPAs. Renewable generators eligible for either the KÁT or the METÁR system are not precluded from at the same time registering and selling certificates of origin, which thus far seems to have discouraged the conclusion of Corporate PPAs.

Sleeved PPAs may be difficult to implement in Hungary, because in this model the corporate would need an electricity trading license, which might prove to be too burdensome. Virtual or synthetic power purchase agreements (“VPPAs”) may therefore be the contractual structure of choice in Hungary. Given the lack of specific regulation and practice, however, some regulatory challenges remain also in the case of VPPAs. It will have to be carefully considered whether VPPAs (often being in principle contracts for difference), may qualify as financial instruments and therefore concluding VPPAs may be considered as investment services which would require the authorization of the National Bank of Hungary. It is yet unclear, for example, whether the non-professional or non-principal nature of a VPPA may exempt VPPAs from being qualified as an investment service

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# Czech Republic



*Corporate PPAs are an opportunity for existing and new generators in the context of an ever more stringent and less favourable subsidy policy.*

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.

Operating subsidies can be currently provided either in the form of green bonuses or as the feed-in tariff. Generators can only opt for one of operating subsidies, they 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.

In May 2020 the Czech Government has introduced an amendment to Act no. 165/2012 Coll., on supported energy resources (“Amendment”) to the Parliament. The main goal of the Amendment is to restore the growth of clean energy and to define a new system of support provided by the Czech Republic as of 2021. The Amendment brings auctions as a new type of renewables support mechanism which is a market orientated 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. Furthermore, given the competitive nature of auctions, this mechanism is considered to be a cost-effective way of promoting renewable energy resources and further eliminates overcompensation. On the other hand, auctions impose certain costs and risks for bidders, which in turn may lead (and will most probably lead) to a lower level of participation in auctions and subsequently may result in more expensive offers. As regards the auctions, the Amendment also gives significant powers to the Government which will be able to modify the individual aspects of the proposed auction-based regime, including types of the supported renewable energy resources, by government decrees.

Finally, the Amendment provides for the overcompensation inspection of generators that were

brought into operation between 1 January 2006 and 31 December 2015. The adequacy of the financial support provided to clean energy generators will be assessed with respect to the maximum value of the Internal Rate of Return (IRR). The overcompensation thresholds are set to be 7% for water, wind and geothermal energy, 6.3% for solar energy, 9.5% for biomass and 10.6% for biogas.

In the context of contemplated changes to the system of subsidies and overcompensation inspections, Corporate PPAs represent new business opportunities for both existing and new energy generators. The involvement of the PPAs offers advantages for both parties. As regards the electricity generators, the reduced overcompensation thresholds are a strong incentive, especially for the solar energy generators, to seek alternative mechanism to make their projects profitable and independent of state support. On the other hand, the corporate end-customers can benefit from the long-term price fixation and supply guarantees.

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

Despite the presence of relevant market stakeholders on energy market who may clearly benefit from the scheme, Corporate PPAs have not yet been widely used in the Czech Republic. Given the fact that the proposed Amendment brings significant changes in the field of energy from renewable sources, it is very likely that the new legal framework will encourage the first negotiations of the Corporate PPAs in the Czech Republic.

## *Market liberalisation and general support of more free market mechanisms have been declared to be a clear path for renewable energy sources in Slovakia.*

Since 2009, the electricity from renewable energy sources (RES) in Slovakia has been promoted to RES producers through a system of feed-in tariff (“FIT”) state subsidy. The FIT consisted of two parts: (1) fixed tariff for electricity and (2) surcharge. The fixed tariff for electricity has been stipulated on an annual basis by the Slovak Regulatory Office and the level of surcharge has been stipulated by means of Price decision for the each specific RES producer according to a Decree of Slovak Regulatory Office.

For several years, Slovak RES producers have been selling the electricity to the distribution system operator, and the option of direct sell to the specific electricity buyer using a Corporate PPA has not been widely used in practice. However, new legislative changes are expected in future. Significant legislative changes to the Act on RES happened as of January 2019. This did not cover Corporate PPAs specifically, but has been considered a positive change to the strictly regulated RES environment in Slovakia aiming to make it more free-market oriented.

Beside shifting more powers from local distribution system operator to one centralised Short-term Electricity Market Operator - OKTE, a.s. in the course of providing the FIT to RES producers, the major advance of the amendment for larger renewable sources is the change of sale of electricity from the system of feed-in tariff (FIT) to a feed-in premium (FIP) upon a success in an auction. This way, the state would principally provide the FIP subsidy to those RES producers which were chosen in the new auction system, i.e. these producers would receive a premium on top of the market price of their electricity production. The smaller RES producers under 500kw would be still receiving subsidy under the previous system of FIT.

Additionally, the amendment to the RES Act promises to establish a new option for businesses to operate their own “local RES” under 500kw for their own use, which would be free of (often demanding) fees, e.g. fee for the grid connection, etc.

As of January 2020, a new amendment to the Act on RES came into force. Beside other changes, the amendment has made important change to regulation of guarantees of origin of electricity.

The guarantee of origin is a document proving that the produced electricity originates from renewable energy sources and serve also as proof for the final consumers. The guarantee of origin issued to the RES producer may also be traded, i.e. transferred from one RES producer to another market participant in return for payment.

The amendment to RES Act has changed the authority carrying out activities related to guarantees of origin. These competencies will be transferred from the Slovak Regulatory Office to the Short-Term Electricity Market Organizer (OKTE).

However, more important change is the change in the conditions for issuing guarantees of origin, which shall be stricter. This change relates especially to the cases when the RES producer has already applied for subsidy by means of a supplement or surcharge. In this case the guarantee will be issued, but will not be kept in the RES producer’s account (name), but in a separate OKTE account and offered on the auctions. According to OKTE, the profit obtained from such activities should be used to reduce the tariff for the operation of the RES system.

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.

Nonetheless, the system of non-subsidy RES projects and the Corporate PPA option itself is not a widely discussed topic in Slovakia at the moment.

However, liberalisation and general support of more free market mechanisms have been declared to be a clear path for the RES in Slovakia. Therefore, we are of the view that Corporate PPAs will be very likely supported and legally implemented in the next couple of years.

*Although Croatia does not recognize Corporate PPAs specifically, they would be legally allowed.*

karanovic/partners

A synthetic PPA would be possible under the current regime without any particular additional regulatory requirements. On the other hand, a direct Corporate PPA would need to fulfil additional formalities. This is because the current legislation defines electricity sale purchase agreements between various market stakeholders (i.e. producer - supplier - consumer), which all must have their respective licences and may act on the market only towards predefined counterparties. Producers may therefore sell their electricity to suppliers, and not directly to end consumers, and vice-versa. Therefore, in order to execute a direct Corporate PPA, either the producer or the corporate as the end consumer would need to obtain a supplier's licence, in order to fulfil the statutory preconditions. This would also invoke other formalities such as additional reporting obligations, divided accounting etc.

There is currently no known case of a Corporate PPA being executed in Croatia.

Primarily, most of the RES electricity production facilities constructed in the past decade still fall under the feed-in RES support system, under which all producers sell all generated electricity to the Croatian Energy Market Operator ("HROTE") under a predetermined fixed price.

In early 2020 the incentive system was significantly amended and feed-in tariffs are now available only to production facilities of installed power up to 500 kW, while all other facilities may apply for premium tariffs. The new system is based on a market principle and the premium tariff is paid by HROTE to RES electricity producers on top of the price they achieve on the energy market. If the market price of electricity is higher than the amount of premium tariff, no premium is paid out, while negative premium is not prescribed. As a result of the new incentive system, we would expect a rise of Corporate PPA's on the market to occur in the future.

Also, the Croatian authorities have not yet fully implemented the EU "Winter Package" of energy regulations, which would allow the execution of a Corporate PPA without any preconditions. The EU "Winter Package" should be implemented entirely into Croatian legislation by the end of 2020.



*In Serbia, the expansion of Corporate PPAs is yet to be seen.*

karanovic/partners

Implementation of Corporate PPAs at the moment would require fulfillment of several regulatory requirements. Among others, Corporate PPAs could work: (i) in the structure where both the producer and the customer located in Serbia would be connected to the grid; or (ii) if the RES producer also holds the license for supply of electricity (and provided that it also complies with the supply-related obligations set under the applicable regulations). Although Corporate PPAs should be permitted under the current regulatory framework in Serbia, there are still no Corporate PPAs implemented in practice. There are several reasons for this.

Most importantly, corporates are not currently driven to look into direction of Corporate PPAs as the prices for electricity coming from electricity suppliers - predominantly from state incumbent Elektroprivreda Srbije (EPS), are still moderately low and have proven to be non-volatile. Most electricity is produced by coal-fired power stations heavily subsidized by the state, both directly and indirectly.

In addition to this, the RES market is still relatively underdeveloped. Although Serbia introduced a FIT

system in 2009, the system would need a number of reforms in order to meet bankability and other criteria to allow implementation of large-scale renewables. At this moment, Serbia is considering introduction of market-based incentives for RES. We think it would be reasonable to expect that Corporate PPAs will follow after this new incentive system is rolled out.

Still, there is some early interest with both RES producers and consumers for Corporate PPAs in the future. And it is rightfully so. Serbia, as a contracting party to the Energy Community Treaty and the EU candidate country, has to implement EU energy legislation and harmonize its framework with, among others, RED II, allowing the spread of Corporate PPAs in Serbia. Maybe even more important - at one point in time Serbian government will need to cease subsidising of coal generation, and this would inevitably lead to increases in electricity prices for electricity supplied by EPS. Coupled with constant cheapening of RES technologies, this should lead to a boost of Corporate PPAs in years to come.





*The Corporate PPA market in Australia is maturing with a good number of deals transacted. A disrupted energy market forecast for years to come presents significant opportunity for corporate buyers.*

Investment in Australia’s renewable and storage industry boomed in the latter half of the 2010s to a high in 2018, largely 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 into PPAs to receive green benefits known as LGCs (or large-scale generation certificates).

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.

Market participants in the energy sector will need to remain cognisant of the transformation taking place in relation to the way in which Australia generates and distributes energy. With the number of renewable energy assets increasing to more than one-fifth of Australia’s total energy output (and growing),, together with the proposed closure of a significant number of coal fired power stations, the natural consequence 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 sustainability, may encourage corporate energy consumers to procure energy directly from local renewable energy assets through the mechanism of a Corporate PPA.

In Australia, there are compelling reasons for corporates to consider procuring energy from clean and renewable energy assets. The first and most persuasive being the falling cost of energy production from renewable energy assets when compared to the cost of energy procured from more customary sources, a gap that is projected to increase in Australia due to Australia’s ageing coal-power infrastructure. 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.

Secondly, with Australian generators and investors finding it challenging to find medium to long term PPAs from a “retailer” or state government backed reverse auctions or schemes, there is a gap in the market that corporates can help to address. If such corporates enter into Corporate PPAs directly with renewable energy generating projects, it provides these projects with contractual price certainty on the price of both the electricity they intend to export



and the value of the associated large scale renewable energy certificates. This will assist projects in meeting bankability requirements, allow them to gain access to different types of senior debt and stimulate further investment in the sector as institutional investors see key project risks around pricing being alleviated.

It is key to acknowledge that the US and European experiences in relation to Corporate PPAs have allowed the Australian market to develop from a rather unique standpoint. Australian corporates can take comfort from such international experience and seek to adopt a best practice approach to selecting which contractual models it will deploy in the market.

Despite a slight slowdown in corporate PPA take up in 2019 relative to 2018, there have been a good number of examples of Corporate PPA style transactions that recently been announced or are currently being procured in Australia, including:

- Sydney Airport, undisclosed MW, 8 year PPA;
- University of Technology, 27 GWh p.a. 10-15 years PPA;
- Westpac, undisclosed MW, 10 year PPA;
- Pernod Ricard Winemakers, 10 year PPA
- City of Adelaide, undisclosed;
- City of Sydney, 10 year PPA;

- Sydney Opera House, 7 year PPA;
- Kelloggs Australia, 7 and a half year PPA;
- Westpac, 63 GWh p.a., 10 year PPA ;
- Swinburne University, 15 year PPA;
- Hawkesbury City Council, 10 year PPA;
- Macquarie University, 7 year PPA; and
- Amazon, 105 MW PPA.

The Pernod Ricard Winemakers, City of Adelaide, City of Sydney and Sydney Opera House PPAs are hybrid ‘virtual generation agreements’ combining wind and solar energy from multiple producers. The majority of the Corporate PPAs listed above are either behind-the-meter PPAs or “synthetic” PPAs (i.e. financial hedges or contracts for difference).



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# Singapore



*Being situated near the equator, Singapore receives a healthy dose of sunshine, so it is not surprising that most of the Corporate PPAs in Singapore involve solar energy.*

The land shortage in Singapore is the main factor in determining the PPA model and solar-leasing is the predominant PPA model adopted by solar energy solutions providers. There are mainly two types of solar-leasing: on-site and off-site.

On-site PPA solar-leasing involves the installation of solar PV systems on the rooftop of the consumer's building. The consumer is only required to pay for the solar energy generated and consumed at a fixed agreed price or a variable rate based on a fixed discount

to prevailing electricity prices. Solar PPAs typically last for a period ranging from 20 to 25 years. Such a model is especially suitable in dense urban cities like Singapore, as it requires minimal land use.

The Housing and Development Board ("HDB") entered into a solar leasing contract with Sembcorp Solar Singapore, under which Sembcorp Solar Singapore will install solar PV panels on the rooftops of 848

HDB blocks in West Coast and Choa Chu Kang, and 27 government sites by the second quarter of 2020.

Other notable on-site PPA projects include Sunseap securing a \$50 million loan to fund a 50MW portfolio of rooftop solar projects across Singapore. Such rooftop projects will range from about 100 kilowatts to 5 MW in size and will benefit from long term power purchase agreements with more than 20 companies.

On the other hand, off-site solar-leasing does not involve the installation of solar PV systems on the rooftops of the consumer's buildings. Instead, solar energy is harnessed from rooftop farms that the energy provider owns in other parts of Singapore or from floating solar panel systems in ponds, lakes or reservoirs. An off-site solar-leasing arrangement is

suitable for consumers who are unwilling or unable to install solar systems on their own rooftops.

Sembcorp Industries entered into a 20 year contract to support Facebook's 170, 000 sq m data centre in Singapore by installing close to 900 offsite solar panels in Singapore between 2018 and 2020. This project will generate 50 MWp of renewable energy and will enable Facebook's data centre and local offices to use 100% renewable energy.

Other projects include Sunseap Group's floating PV system and Jurong Town Corporation's ("JTC") SolarRoof project. Sunseap Group's floating PV system is of about 5 hectares on the sea near Singapore's northern shores and it is anticipated that it will generate 6,388 MWh of renewable energy annually. JTC entered into the SolarRoof contract with Sun Electric in 2017 to supply, install and maintain solar panels on the rooftops of JTC's buildings. The SolarRoof project enables the direct export of solar energy that is generated from the rooftops of JTC buildings to the national grid. Electricity that is generated by such solar panels is currently available for purchase by commercial entities.

The latest corporate PPA in Singapore is the PUB floating solar project at Tengeh reservoir where Sembcorp has signed a 25 year PPA for a 60 MW floating solar plant to power five waterworks operated by the PUB. The floating project is scheduled to come online in 2021 with 146,000 solar panels.

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# South East Asia



*Elsewhere in South East Asia, the majority of PPAs involve off-takers (purchasers of energy) that are state-owned energy utilities. However, corporate off-takers are emerging and the corporate PPA market is seeing steady growth.*

Corporate PPAs that have been executed in South-East Asia are concentrated within Malaysia, Vietnam and Indonesia. In the Malaysian State of Sarawak and in Merchang, Jasin, Gurun and Pahang, State government initiatives have resulted in an increased inflow of investments and projects in Sarawak, which has in turn driven up the demand for energy. As such, Sarawak Energy, an electrical utility wholly-owned by the State of Sarawak, has been entering into PPAs with various corporations for the supply of renewable energy.

In April 2018, Tenaga Nasional Bhd, the Malaysian electricity utility, signed a power purchase agreement for a period of 21 years for a 30 MW solar project in Mukim Bebar, Daerah Pekan, Pahang.

In April 2019, Ayala-led AC Energy, Inc. launched a 330-MW solar power plant in Vietnam in partnership with Vietnam's BIM Group and its site exceeds 300 hectares of land. It is anticipated that this project will generate more than 545 million kilowatt-hours of renewable energy annually.

In Vietnam, the Ministry of Industry and Trade is preparing to launch a pilot program that will facilitate the signing of PPAs between private power buyers and renewable energy producers, targeting contracts for up to 1 GW in 2020-2022. Electricity consumers participating in this scheme will be limited to industrial manufacturing companies and have priority if they have committed climate change mitigation and sustainability targets.

In Indonesia, PT Sumber Energi Sukses Makmur (SESM) plans to build a 10.5MW hybrid solar plant in South Sumatra which will sell power under a 20 year power supply deal to palm oil provider PT Golden Blossom Sumatra.

In the Philippines, the implementation of a green energy option program will give rise to a strong market for renewable energy generation by enhancing competition among power suppliers which will lead to growth opportunities for the Philippines' corporate PPA market.





*Record commitments to renewable generation in 2018 and 2019 mean that corporate purchasers are major drivers in the development of new wind and solar power generation projects in the United States. Megawatt numbers vary depending on the source; however, there is no dispute about the significant role played by corporates. While corporate offtakers were initially focused on wind generation, corporate offtakers now regularly contract for solar generation as well.*

Any overview of the U.S. market would be lacking if it did not first address the regulatory and market structure of the U.S. market. First, the U.S. 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 U.S. 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) “Organized Markets” controlled by independent system operators, such as the California Independent System Operator (“CAISO”) and New York Independent System Operator (“NYISO”), and regional transmission organizations, 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 Organized Market category.

This web of markets and regulations means that when looking across the United States for examples of corporate offtake agreements at the retail level, one can find “Direct Sale” PPAs, “Sleeved” Corporate PPAs, and “Behind the Meter” PPAs. “Direct Sale PPAs” are found in states that allow a customer to choose its retail electricity supplier. These states include Texas, California, Illinois, Massachusetts, Michigan, Ohio, Pennsylvania, New Jersey and New York. Direct Sale PPAs in states that allow them, are subject to various state regulatory policies and limitations that include customer size limits, and 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.

“Sleeved” PPAs are found in those states in which a direct sale to retail customers is either prohibited by state law or allowed 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. 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 are also found at the retail level. The "Behind the Meter" nomenclature refers to generation that directly 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.

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 in the parlance of the U.S., 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 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 will follow 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 Floating Price and Fixed Price. If the Fixed Price exceeds the Floating Price, the corporate offtaker pays the renewable generator the difference between the Fixed Price and the Floating Price. 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.

This pricing structure raises three key 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, that are thought to have relatively stable credit ratings, corporate credit ratings can be volatile.

The second issue that arises from the pricing structure is market liquidity. 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 Organized Markets such as ERCOT, SPP and PJM.

Third, 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 in order 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 and not production.

While the pricing structure shares features with a pure financial hedge from a bank or other hedge provider, the VPPA 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 guaranty 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.

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.

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.

Two other elements of VPPAs that distinguish these agreements from other PPAs require mention. 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.

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) guaranties 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). Each of these issues raises commercial and legal issues that should be carefully considered.

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# 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 1350 lawyers in 29 offices across Europe, the Middle East and Asia-Pac, as well as close ties with firms in other parts of the world.*

Our Energy and Utilities team of over 150 lawyers spread across our network advise on energy and utilities matters across all of our practice areas. As an international team, our sector approach is not broken down by offices but into sub-groups that focus around particular aspects of the Energy and Utilities sector.

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.

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

We believe we have one of the leading international renewable energy practices in the world, and have been ranked second globally in the 'Mergers and acquisitions in Renewables' league tables produced by Clean Energy Pipeline in 2019.

This builds on our ranking for the previous two years of being the number one law firm for global M&A and projects/project finance deals.

We are a cohesive and expert team who understand how to work together to complete renewables projects to international investor standards.

This industry experience has meant we have closely tracked the emergence of Corporate PPAs, where global multinational corporations are buying electricity directly from wind and solar generators. This completely revolutionises the market for renewable power from subsidy and utility driven to market demand driven. We consider we are at the forefront of this market, having developed and negotiated innovative contract and business PPA structures, from physical PPAs to synthetic/virtual PPAs and most recently blockchain PPAs.



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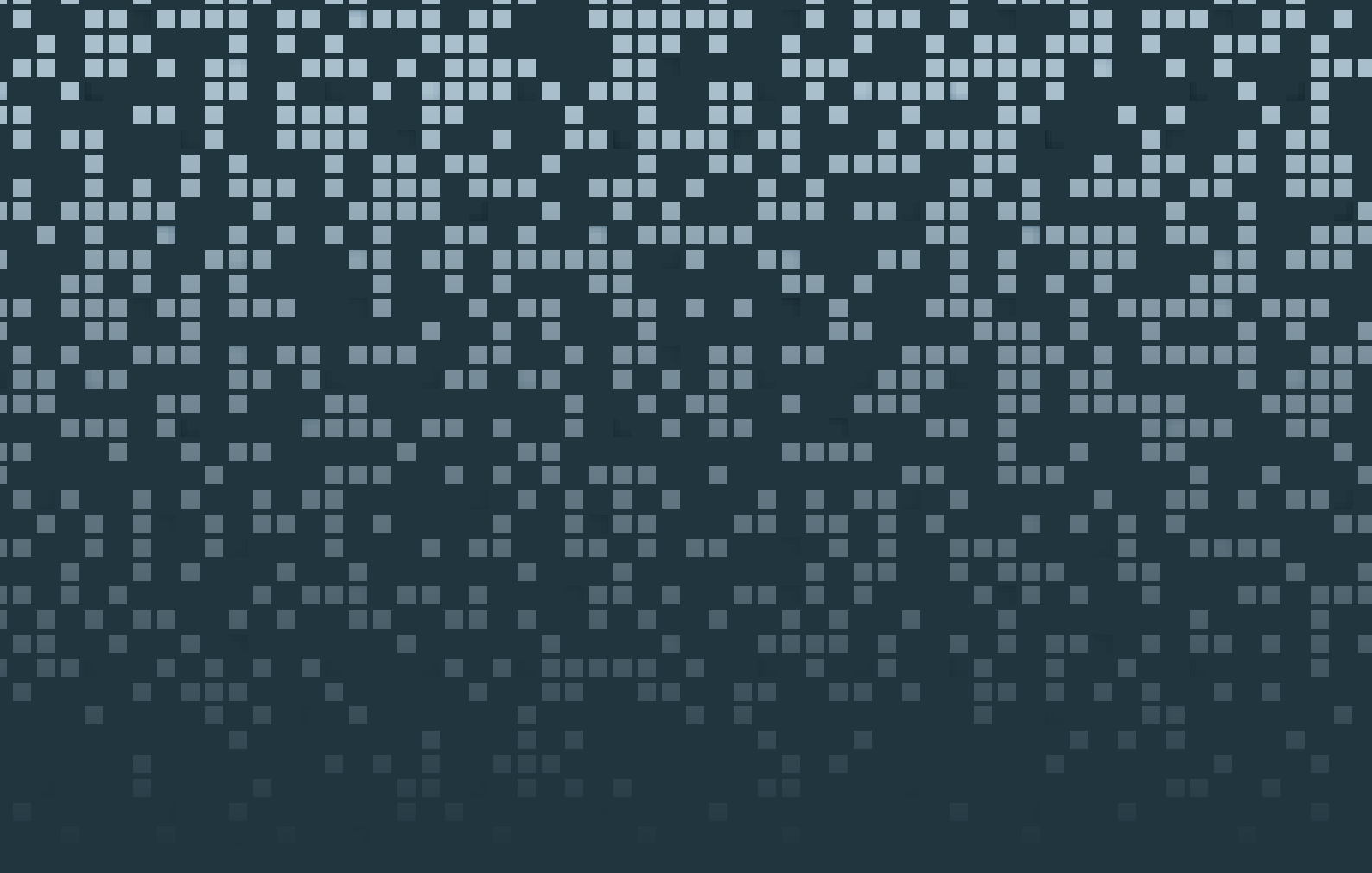


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