Offshore Wind Explainer

Government of JERSEY

PPAs and VPPAs

Overview

Power Purchase Agreements (PPAs), and Virtual Power Purchase Agreements (VPPAs), are two similar commercial mechanisms by which long-term contracts (usually between 5 and 20 years) between a buyer and seller of energy, are created. They also include penalties for not meeting the agreement and agreeing to certain aspects of logistics and delivery.

The seller is usually the energy generator, and the buyer is usually a large company, government, or utilities provider.

In essence, agreements set a fixed, pre-agreed price for the energy being purchased throughout the life of the contract. The benefit of this setup is that it provides the buyer with the ability to hedge and have a stabilised energy consumption cost, whilst for the seller, it provides a guarantee of a long-term market, enabling low-risk investment in renewable energy production.

This is explained diagrammatically on the next page.

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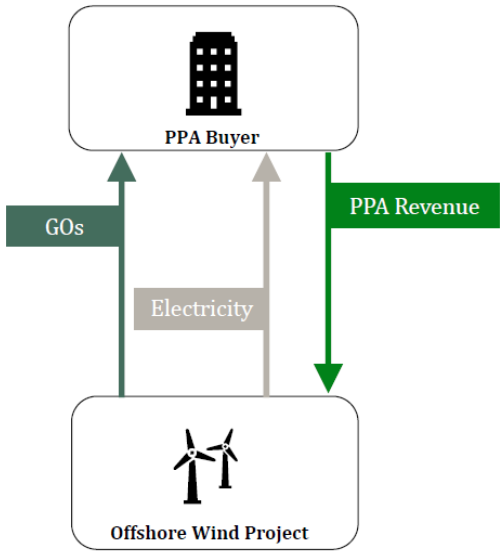
Approaches to long-term power purchase contracting

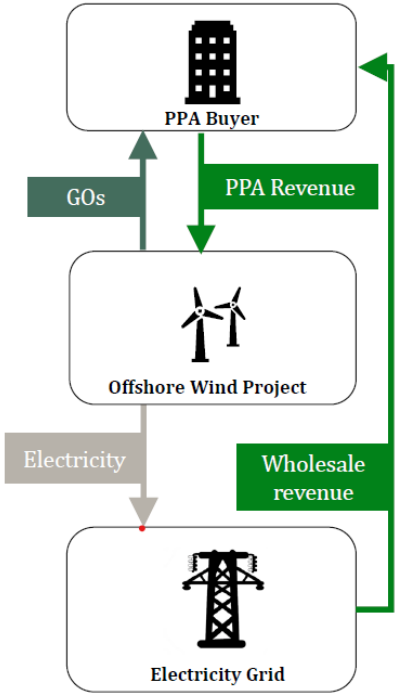
OSW developers like TotalEnergies, ENGIE sign power purchase contracts to cap market risk, and ensure long term revenues for their project, set out below are descriptions of some typical contract structures used in the market today

Direct Power Purchase Agreement (Direct PPA)



- Long-term ~12-20 yr. contract with a corporate buyer or a utility to sell renewable electricity from an offshore wind project at a fixed price per Megawatt hour generated
- Project developer owns and operates project
- Electricity generated by the project is physically transferred to the PPA buyer for their facility use or transmitted to customers
- Guarantee of Origin (GO) certificates generated by the project that enables claims against carbon emissions is also transferred to the PPA buyer

Virtual Power Purchase Agreement (VPPA)



- Long-term ~12-20 yr. contract with a corporate buyer to sell renewable electricity from an offshore wind project at a fixed price per Megawatt hour generated
- Project developer owns and operates project
- Electricity generated by the project is not physically transferred to the PPA buyer. The PPA buyer pays a fixed price and receives revenue from the floating wholesale market
- GO certificates generated by the project that enables claims against carbon emissions is transferred to the corporate buyer

PPAs

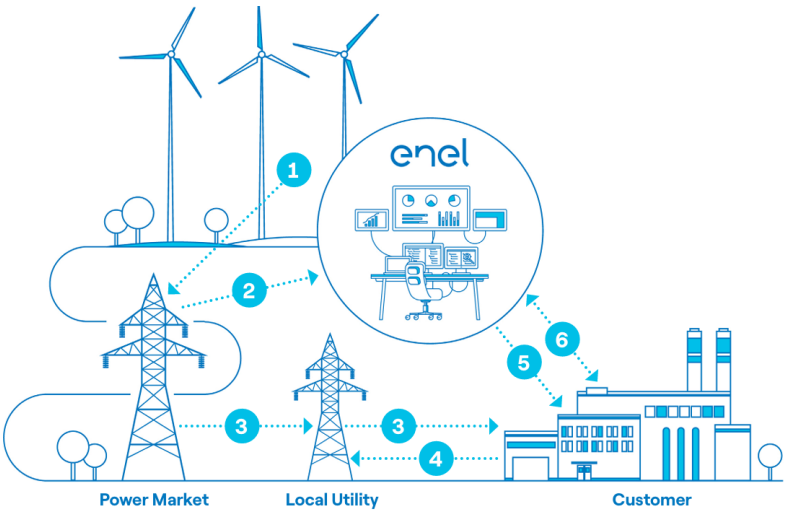
A (physical) PPA is a contract that allows the buyer to purchase the direct energy being produced by the seller, produced by a renewables project (or projects) within the same electricity grid as the buyer's facility. A PPA requires the buyer to be in a deregulated market, where they are free to choose their electricity provider. The agreement would usually stipulate the seller as being responsible for delivering the electricity to a certain point in the grid, at which time the buyer takes responsibility. If the buyer is a utilities provider or similar, they would then be responsible for the onwards sale of electricity into the marketplace, including the transmissions costs. If the buyer is a business, they would have the responsibility of ensuring the electricity is able to be met and used by the facility it has purchased for.

There is also the possibility of an on-site PPA, where the energy is generated on the site of the buyer, for example through solar panels on the roof of their building. The energy generator manages and maintains the equipment used for the power generation, and then sells the energy produced to the buyer.

VPPAs

Under a VPPA, the buyer does not purchase specific energy being produced from a specific source by a producer. It is essentially a financial transaction, whereby the buyer agrees with a producer of renewable energy the strike price (an agreed price per MWh) for the length of the contract between the producer and buyer. The supplier will sell the renewable energy to the grid at the market price. The buyer will continue to purchase his electricity from the local grid's supplier, but the agreement between the buyer and renewable energy producer means that, depending on the market price the renewable energy is sold for to the grid, the buyer or the seller pays the other the difference, depending on if the market price for the period being settled has been higher or lower than the strike price agreed in the VPPA. In essence, it allows the buyer to meet climate change or renewables targets at a stabilised price, where there might not be the ability to buy directly within the existing grid.

There are some advantages in VPPAs in that it enables smaller businesses to take part and meet climate targets, there is greater geographical flexibility in where the renewables can be produced. For a buyer who has a grid that cannot meet the current renewables demand or where a business is isolated from renewable sources, it enables a business to meet their climate change goals sooner, without having to wait for the grid or the renewables sources to be created and developed.



1 Renewable energy is sold into the power market
2 The power market pays the current market price
3 Electricity is delivered to the customer via the local utility
4 The customer pays the utility for the electricity (as before)
5 RECs are transferred to the customer
6 The difference is settled between the contract price and the current market price

[1]

Renewable Energy Certificates (RECs)

Energy Certificates are formal and verified records of how much energy a company or business is using, based on its consumption of various types of energy. In the UK, in relation to renewables and climate change, examples are Renewable Obligation Certificates (ROCs), or Levy Exemption Certificates (LECs), and Renewable Energy Guarantee of Origin (REGOs).

RECs are certificates that confirm a company is using renewable energy, either directly or through a VPPA, generally recorded by MWh used from renewable sources. This can be directly purchased energy or purchased equivalent energy produced that might otherwise have been produced by fossil fuels. These can be important for accessing government schemes or subsidies and meeting national targets/standards. There have been some criticisms of the certification, whereby existing long-established renewables producers were selling certificates, which therefore didn't reflect the principle that a buyer is investing in ***new*** renewable sources being added to the grid.

Energy Certificates are separate from carbon reporting requirements under the Paris Agreement. Under the Paris Agreement, the producing state accounts for carbon emissions (so currently France accounts for the emissions for Jersey's imported electricity, whereas Jersey accounts for the emissions from the Energy from Waste facility). RECs issued by the operator of a Jersey offshore windfarm would not directly change the amount of carbon emissions reported by Jersey under its Paris Agreement obligations.

[1] Enel "Understanding Renewable Energy Agreements" (Understanding-Renewable-Energy-Agreements_eBook_NA_03-23.pdf) p5

Emissions Trading and PPAs/VPPAs

Emissions trading is facilitated by PPAs and VPPAs. In essence, businesses will obtain RECs or equivalent through the purchase of renewables under a PPA or VPPA. This enables the business to purchase clean energy either directly or indirectly and obtain certification that they have moved to a reduced carbon or carbon neutral mode, as part of their business model. With investors increasingly concerned around ESG issues, this can be of importance both for private ESG concerns and for government climate change targets and associated subsidies and investments that are then made available to a business.

There is increasing work across the regulatory frameworks of multiple jurisdictions on how VPPAs and similar schemes are validated and to how they meet targets. In general, there seems to be an effort to tighten up what is claimed to be a new renewables investment compared to what the reality of increased renewables being invested in is. In particular, where the investment is not geographically close to where the business is operating, the long-term benefit (or lack of) to the local region of the buyer is important.

Exhibit 2. Examples of VPPA contracts

Organizations across the public and private sector engage in VPPAs of varying sizes. A small subset of examples is below.

Organization	Project size	Energy type	Counterparty
Takeda	350 MW	Wind	Enel North America
McDonalds	255 MW	Solar	EDF Renewables North America
Boston University	205 MW	Wind	ENGIE North America
Kraft Heinz	158 MW	Wind	Berkshire Hathaway Renewables

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[2] KPMG "Decarbonizing with Virtual Power Purchase Agreements" (Decarbonizing with virtual power purchase agreements) p3