Učešće industrije na tržištu električne energije

PPA contractual framework

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What is a PPA?

- To promote RES, governments initially provide financial incentives for investment such as subsidies (feed-in-tariffs, feed-in-premiums…)
- In a feed-in tariff world, renewable energy investors did not need to manage price risk!
- With improved technology, renewable assets have become cheaper to build - consequently, governments begin to move away from subsidy schemes
- Market shift from subsidised projects to open markets has drastically affected renewable investors, they now need to find alternative securities to replace government subsidies!

What is a PPA?

- A power purchase agreement (PPA) is a contractual agreement between energy buyers (off-takers) and sellers (RES project/Investors) to purchase an amount of energy at an agreed price, for a certain time, in advance of producing the energy
- PPAs are usually signed for a long-term period between 10-20 years
- PPAs can support new investment or cover an existing asset previously under a feed-in tariff (replace an expired contract)
- Main purpose of PPAs:
  - Project financing - bankability, counterparty risk, COD project financing
  - Risk management - hedging and long-term price predictability

Benefits of a PPA

- Power purchase agreements come with environmental, financial and brand benefits
- On the sustainability front, PPAs are a reliable way for organizations to meet their green energy commitments and help bring new renewable sources online
- On the financial side, PPAs are often more affordable than other ways of procuring renewable energy
- Power purchase agreements involve some financial risk, but the right mitigation strategy can protect consumer from market volatility and provide insulation against rising energy costs

For a RES owner/developer	For a buyer/off-taker	For a lender
• PPA allows renewables projects to increase their level of revenue certainty • Enables the financing of their renewable project by lenders • Reduces risks by efficiently allocating them among the contractual parties	• Assures fixed long-term costs • Enables a company to (indirectly) fund a renewables project and receive “green attributes”, such as RES certificates, i.e. Guarantees of Origin	• Offers revenue certainty, as an amount of energy has been sold in advance at an agreed price • Allow for the claim of their contribution to the renewable industry – ESG context

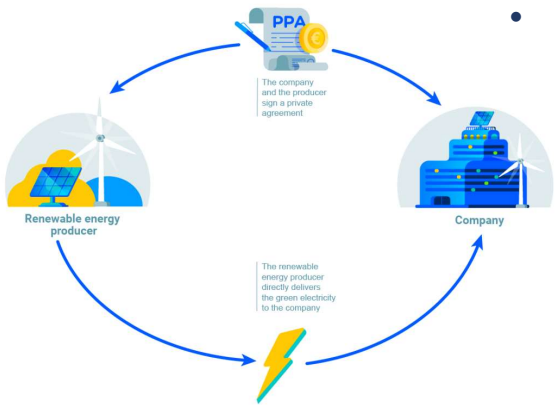
PPA key points

Key points	
Commercial structure	Type of PPA to be used (pay-as-produced (with or without volume cap), pay-as-nominated, annual/monthly baseload etc.) has a strong impact on the risk distribution among the parties
Energy risks	Following key energy risks should be considered: Price risk, Liquidity risk, Volume risk, Profile risk and Balancing risk
Duration	Duration of the PPA (how long the fixed price is set for), possibility to renegotiate the price, what is the start date of the PPA (COD, grace/delay period or similar)
Price fixing	Fixed price or appropriate Reference price should be defined (in case of financial PPA)
Counterparty (credit) risks	The credit risk refers to the risk that the buyer will not be able to meet its contractual payment obligations agreed into the PPA contract. Know who your direct counterparty is and follow their company's credit development. The same applies to the seller, e.g. what if the project runs out of money before COD? It is a crucial topic in securing financing for a greenfield project, so proper financial guarantees need to be in place.
Settlement	Physical or financial PPA, treatment of negative prices etc.
Underlying contract	An underlying master agreement contract could be in place based on the EFET (European Federation of Energy Traders) or an ISDA (International Swaps and Derivatives Association)
Regulatory risks	What happens if there is a change in the law that materially affects the obligations of one or both parties in the agreement? This can affect the balance of revenues or risk between the parties, so contractual adjustments could be envisaged.
Performance guarantees	Contractual treatment of under-performance. A performance guarantee refers also to the case where the production at COD does not meet the contractually agreed-upon expected production. Consider how this settlement will be addressed between both parties.
Termination	What are triggers that could lead to a potential contract termination?

PPA types – physical PPA

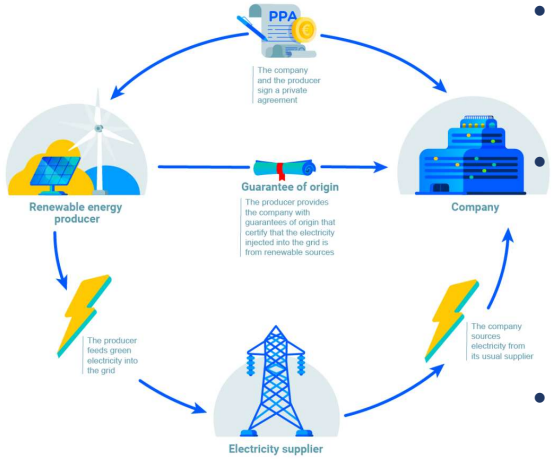
- Power purchase agreements can be physical or financial (virtual).
- With a physical PPA, the seller delivers electricity directly to the buyer (utility or corporate off-taker).
- In the most cases, this is an agreement of the physical delivery of electricity, executed in cooperation with the supplier (electricity trader) as a third party (so-called “sleever”) between the customer and the RES producer

Physical on-site PPA



- RE power plant is directly connected to the consumer, i.e. electricity is consumed on site)

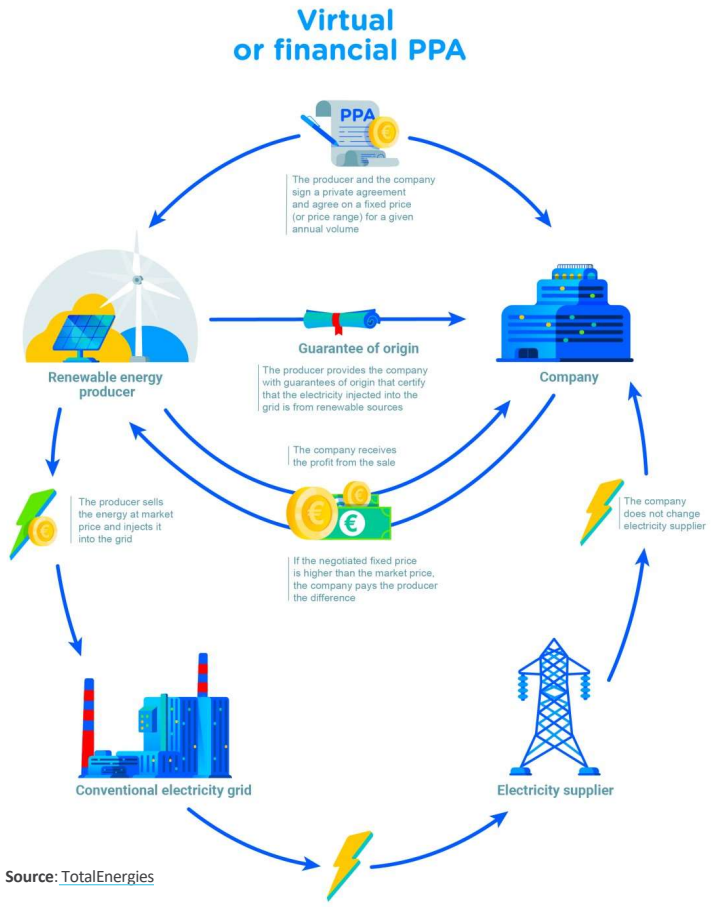
Physical off-site PPA



- Utility scale RE power plant is located off-site and connected to the grid
- Electricity produced by the renewable facility is injected into the power grid (i.e. electricity market) to supply the customer
- GoO’s are attached to the electricity

Source: TotalEnergies

PPA types – financial PPA

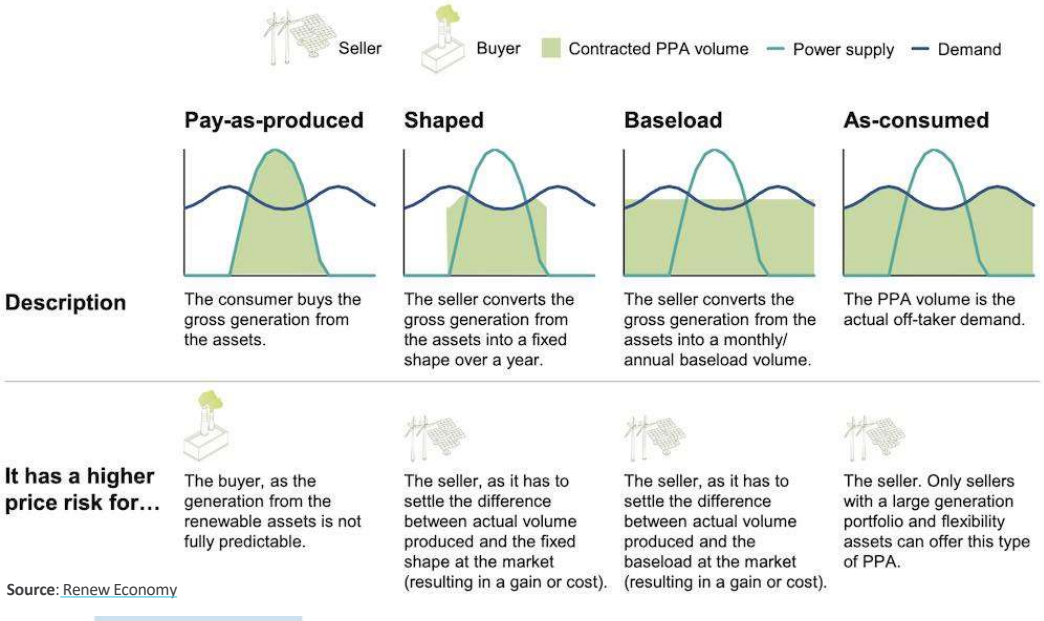


Source: TotalEnergies

- A virtual PPA is a financial agreement (CfD), not a contract for physical power.
- This secures the investment, ensuring a regular income for the renewables project, but there is no physical delivery of electricity under this model.
- In a VPPA, the buyer continues to purchase electricity from its supplier as usual, and the RES sells its electricity to the market at market reference price.
- If the market price is lower than the fixed PPA price, the buyer pays the difference to the seller and vice versa - if the market price is higher than the fixed price, the buyer makes a profit.
- In both cases, the buyer receives Guarantees for origin (GoOs) to lower its carbon footprint.
- Virtual power purchase agreements are ideal for organizations with widespread operations, like banks, mobile operators, big retail companies etc.

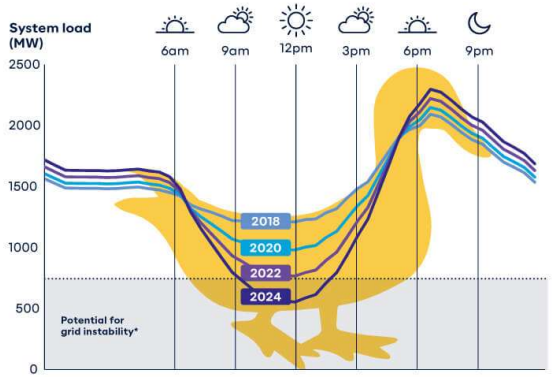
PPA types – commercial structure

- **Pay-as-produced:** the buyer (off-taker) commits to buying all or part of the actual electricity produced by the renewable asset. This type of contract benefits the producer because it involves almost no risk: all production will be sold at the agreed-upon price.
- **Pay-as-nominated / Pay-as-forecasted:** the off-taker commits to purchasing the electricity from the asset based on the hourly production forecasts provided by the producer on the previous day.
- **Baseload:** The consumer agrees to purchase a fixed output defined on an hourly, monthly, quarterly or annual basis. In the case of under or over production, the producer must buy or sell the difference on the wholesale market.



PPA Energy risks

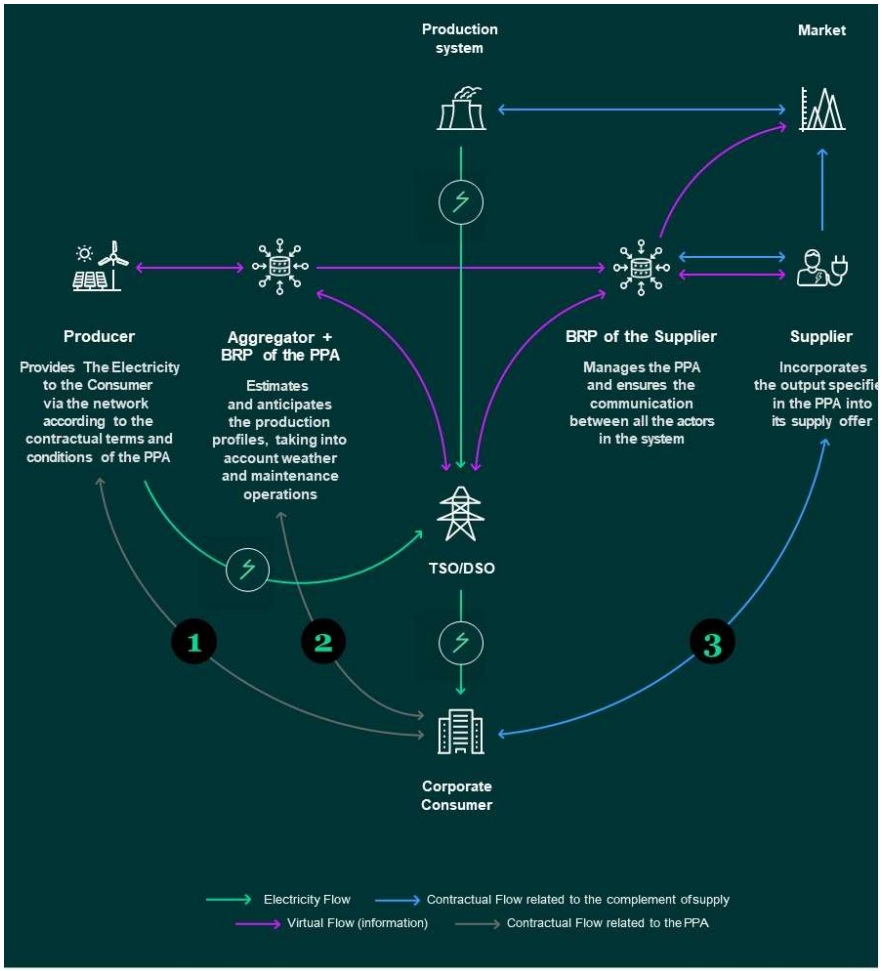
- **Price risk** refers to shortfalls for both parties in relation to market opportunities.
- **Liquidity risk** is linked with the liquidity of the underlying reference market price, i.e. possibility to execute PPA contract without affecting the market price.
- **Volume risk** is the uncertainty related to how much electricity the asset produces each year. If there are significant drops in production, it can expose the off-taker (consumer) to the market, causing the off-taker to lose income and the producer to face potential penalties.
- **Profile risk** is the uncertainty about when and how electricity is used or produced daily. Changes in how electricity is produced can lead to losses for the off-taker (consumer), who might need to buy electricity from the markets temporarily, or for the producer, who has to make up for deficits to meet the consumer's needs.
- **Balancing risk** is closely linked with the technology (wind, solar etc.) and it is usually handled by the physical supplier (aggregator or BRP) which is not directly included in the PPA framework.



Source: Synergy - Solar Duck Curve in Western Australia

Putting PPA into action

- Putting a PPA into action involves various actors and many steps.
- In this complex ecosystem, one player may take on several roles.
- For instance, the Aggregator can also be the BRP for the PPA.



1 **PPA**
Corporate off-site physical PPA, directly concluded between a RES producer and a Consumer

2 **PPA contract management**
The Consumer has entered a contract with an Aggregator for the management of the PPA

3 **Supplementary supply contract**
The Consumer has entered a contract with a Supplier for the integration of the PPA and supply contract

PPA Market insight

EUROPEAN PPA MARKET 2023

16.2GW

272 deals

10.5GW
#160

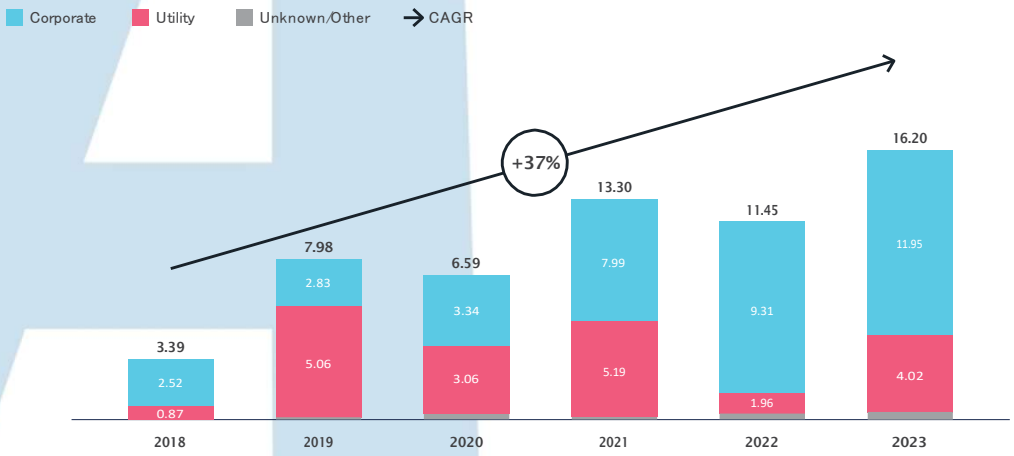
2.3GW
#58

2GW
#20

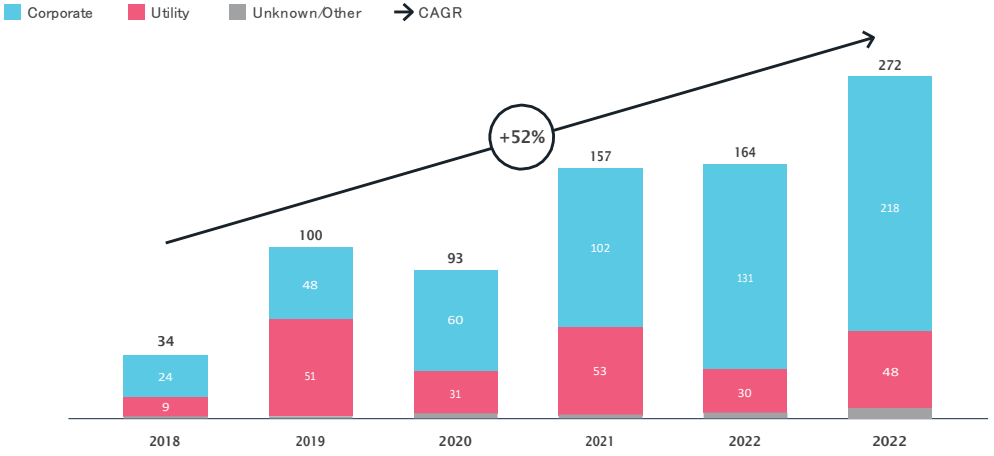
TOP BUYER amazon

TOP SELLER Iberdrola

PPA deal flow by disclosed contracted capacity, 2018- 2023 (GW)



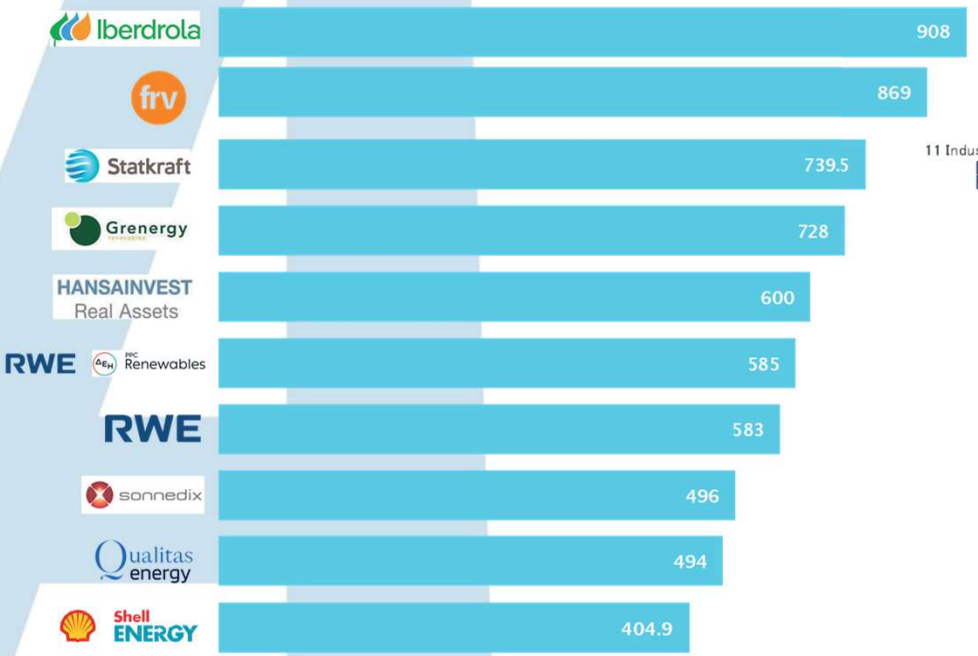
PPA deal flow by deal count, 2018- 2023 (# deals)



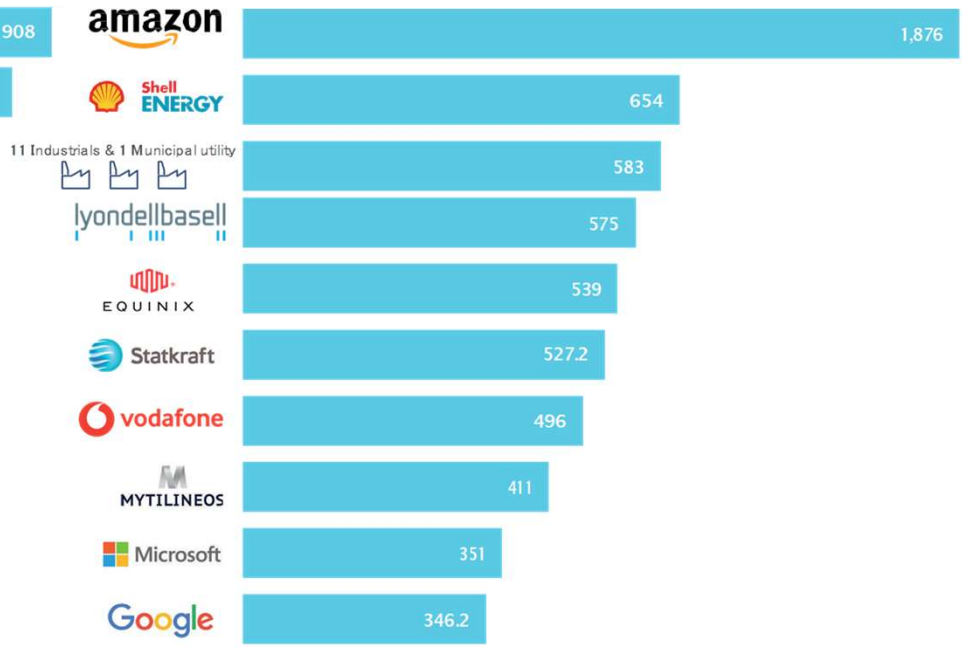
Source: PexaQuote, *PPATracker*

PPA Market insight

Top Sellers in 2023 by volumes (MW)



Top Buyers in 2023 by volumes (MW)



Source: PexaQuote, *PPATracker*

Hvala na pažnji!

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