

Understanding PPAs

A no-nonsense guide to corporate
Power Purchase Agreements in
renewable energy





Understanding PPAs

While the fundamental principles of a **Power Purchase Agreement (PPA)** are relatively simple, the language used to describe them is not. Frequently, a number of different terms are used to mean the same thing, or vary between different countries and regions.

For businesses keen to experience the many benefits of buying clean energy, this can stand in the way of procurement decisions.

It is for this reason that we have created 'PPA Jargon Buster' to outline as clearly as possible how a PPA works in practice and the opportunities it can create for your business. We also provide a glossary of the key financial and technical terms you can expect to encounter as part of PPA procurement.

Terms highlighted in bold throughout this document are defined in the glossary, starting on page 14.

KEEPING IT SIMPLE.

Last year corporate Power Purchase Agreements (PPAs) saw record growth worldwide.

This growth has been founded on an increasing – and evolving – appetite from businesses both large and small to purchase clean energy, directly from its source.

Originally a mechanism pioneered by the high-profile technology giants such as Google, Microsoft, Apple and Facebook to draw clean power for datacentres, PPAs are increasingly becoming part of the energy buying process for corporate and industrial businesses in a wide range of sectors.

Globally, according to Bloomberg New Energy Finance, 13.4GW of renewable energy was bought by 121 corporates via PPAs in 2018, up from 6.1GW in 2017. While, particularly in the US, technology firms still make up the bulk of this number, financial services, telecommunications and industrials are rapidly increasing their share.

This evolution isn't just predicated on companies wanting to be 'greener' in their purchasing decisions. While environmental social governance (ESG) is high on the agenda for corporate firms, signing a

renewable energy PPA is a good way to meet sustainability goals at a competitive price.

These dynamics mean that, more than ever before, businesses need to understand their energy procurement. For forward-looking firms seeking to improve efficiency and create long-term cost-savings, taking the time to learn about clean energy buying can offer huge benefits, but adopting a clean energy buying strategy from scratch is no mean feat.

Renewable energy PPAs take a number of forms, and to the uninitiated, finding the best structure may seem highly complicated. Buyers need to understand how PPAs are arranged, how the risk profile between agreements may vary, and the underlying factors that determine whether an agreement is, in fact, right for them.

Unless we keep it simple, it may be hard for businesses to understand exactly what they're buying, and how to buy it. We hope that The Jargon Buster provides some much-needed clarity.

If you are considering how a renewable energy PPA could benefit your business – or would like to discuss the content of this guide in more detail – please don't hesitate to contact RES directly.

All the best,
Richard Russell, Group Commercial Director





THE BASICS

What is a Renewable Energy Corporate Power Purchase Agreement (PPA)?

As the name suggests, a Power Purchase Agreement (PPA) is an agreement to buy power directly from an energy generator; in this case a renewable energy generator.

A contract is signed between the energy generator (the **seller**) and the **buyer**, who is also known as an “**off-taker**”. Under the terms of this contract, the off-taker agrees to buy some or all of the output of a renewable energy project at an agreed price, for an agreed term.

Why choose a corporate PPA?

As mentioned, PPAs enable businesses to procure renewable energy directly from the generator. This means that, while PPA structures are naturally more complex than paying **green supply tariffs** to a utility, or the purchase of **green certificates**, they offer a number of benefits that support the objectives of sustainability managers, energy buyers and finance directors in equal measure.

Who is involved?

The seller:

The developer, owner or operator of a wind farm or solar project. The seller is often

referred to as an **Independent Power Producer** (IPP) or Non-Utility Generator (NUG).

The off-taker:

A corporate entity that intends to be the **end-user** of the power generated, or that wants to offset its carbon emissions. Corporate end-users range from large multinational firms buying the entire output of a renewable energy project to power energy-intensive facilities, to small and medium businesses buying a proportion of that output. It can also relate to on-site renewable energy systems that sit ‘**behind the meter**’.

The utility:

The local power utility plays a role in the delivery of power from the seller to the end-user. In some cases more than one **utility** may be required.

When is a corporate PPA suitable?

These long-term benefits are appealing, but it is important to ensure that commercial circumstances are favourable before considering a PPA.

Important factors to consider are:

Sustainability targets – Have your sustainability targets been set? Are goals in place to reduce the **carbon footprint** of your business or become **carbon neutral**? These targets are important drivers for signing renewable energy PPAs.

Green supply tariffs – Does your business already procure energy from renewable sources via a green supply tariff? Buying renewable energy from a utility and obtaining green certificates present alternative options for businesses seeking to enhance corporate image and sustainability. That said, green certificates don’t always lead to new renewable projects being built, and so might not meet ‘Additionality’ goals which are a key part of many sustainability plans.

Energy consumption – Do you understand exactly how much energy your business is using and where it is being used? Are measures in place to reduce electricity consumption, or enhance **energy efficiency**? Before a

PPA is considered, businesses should fully understand their **energy consumption** profile and take steps to optimise this, for example, via use of LED lighting or scheduling key processes.

Board approval – Is there buy-in from a senior level to enter a renewable energy PPA? It is essential that your Executive Board fully supports and understands the role a PPA has to play from a financial perspective as a long-term hedge against rising electricity prices. There are other stakeholders to consider such as your finance teams who would need to support this new commitment and your comms team would need to be able to explain the PPA.





PPA STRUCTURES

How is a corporate PPA typically structured?

While each agreement is tailored based on the unique circumstances and energy demand of the buyer, PPAs signed by corporate players typically fall into one of three broad categories:

'Physical' or 'Sleeved' PPAs

Physical PPA structures see power physically delivered to the buyer – either directly from the seller, or via a utility partner. This arrangement usually sees the buyer enter into two separate PPAs – one with the seller, and one with a utility that will act as an 'agent' to manage the offtake of power from the renewable energy project on the buyer's behalf. A key advantage is that it enables the buyer to account for intermittency of output from the renewable energy project.

1. **PPA with seller** – The power price and contract duration is agreed between the corporate buyer and the seller. The price may be fixed, escalated over time or tied to a key index. The duration may also vary, with most sellers wanting a minimum term of several years to ensure a project can be financed.
2. **PPA with utility** – The corporate buyer agrees with the utility how the natural intermittency of renewable generation is handled. In most cases the best way involves a credit against the buyer's electricity requirements.

3. **Management of power offtake** – The utility manages ongoing delivery of power from the seller to the buyer
4. **Green certificates issued** – The buyer is commonly issued the green certificates associated with the project to prove that renewable power has been consumed.

'Synthetic' or 'Virtual' PPAs

Under this structure, there is no physical transfer of power from the seller to the buyer. Instead, the agreement is financial, based on a pre-determined strike price and Contract for Difference (CfD). This arrangement affords both parties long-term certainty over power prices.

Strike Price agreed: A strike price, which is a cost per megawatt-hour (MWh) of electricity, is agreed between the corporate buyer and the seller.

Sale of power: Power generated by the seller is sold to the local grid at market price.

Contract for Difference: If the market price at the time of sale is higher than the agreed strike price, the seller will pay the difference to the buyer. If the market price is lower than the agreed strike price, the buyer will pay the difference to the seller.

Green certificates issued: The buyer is commonly issued the green certificates associated with the project to prove that renewable power has been consumed.

Cap and Floor: Another approach includes a floating price structure with a cap and floor where the Cap is the maximum power price that the buyer agrees to pay the seller, and the Floor is the minimum price.

'On-site' or 'Behind the Meter' PPA

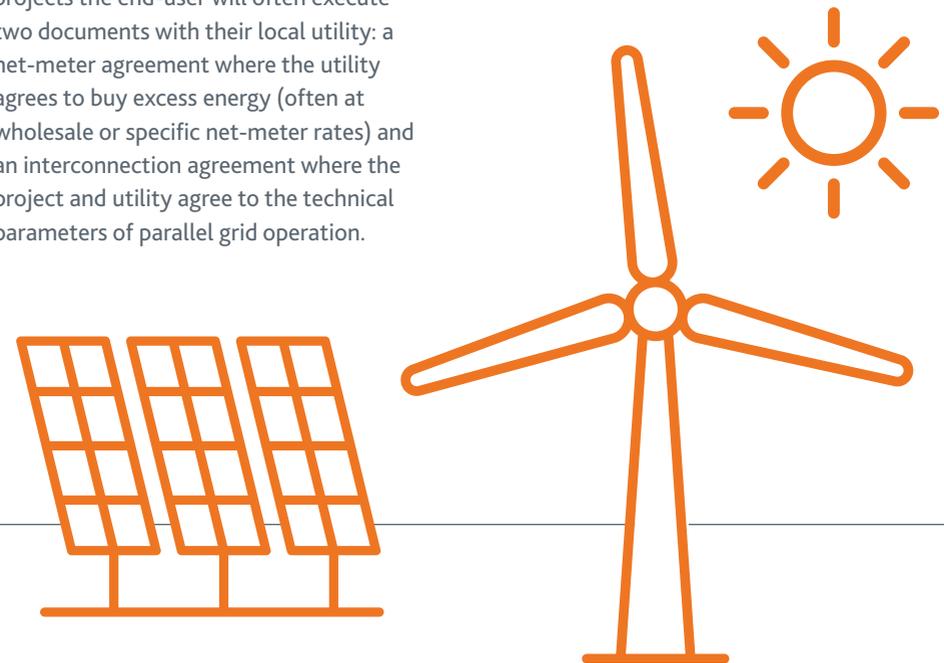
This is the most direct form of corporate renewable energy consumption, with power generated by on-site, 'behind the meter', or distributed projects, such as ground-mounted or rooftop-mounted solar panels, or a small wind energy either of which may also include energy storage installation.

The size of these projects is determined by available land, facility usage, and state and local net metering policies. For these projects the end-user will often execute two documents with their local utility: a net-meter agreement where the utility agrees to buy excess energy (often at wholesale or specific net-meter rates) and an interconnection agreement where the project and utility agree to the technical parameters of parallel grid operation.

These projects are often financed in one of two ways:

1. The business end - The user of the electricity finances the project with their own money and owns and operates the project.
2. The business signs a Power Purchase Agreement (PPA) with a third-party investor who owns and operates the project and the business purchases all electricity generated by the facility.

These often require a grid connection for the operational life of the asset so that the power can be delivered to the grid in the case of the business no longer being present.





PPA JARGON BUSTER

| TERMS | DESCRIPTION |
|----------------------------|--|
| Additionality | Renewable energy capacity added to the grid as a direct result of a corporate PPA. In this context, additionality is used to refer to clean energy projects which would not have happened without the buyer's contribution. |
| Balancing mechanism | A tool used to balance supply and demand in grid systems, ensuring that available power matches consumer requirements. |
| Bankability | A project is referred to as bankable if it is expected to produce an acceptable rate of return (above hurdle rate) over a given time period. In renewables, this often means exceeding the CAPEX and any additional costs within a certain time frame. Another important consideration is contract terms that conform to what is commonly accepted by other market participants. |
| Baseload | The minimum level of demand on an electrical grid over a given time period. Electricity generation assets which are used by the grid to match this demand are often referred to as "baseload". |
| Behind the meter | An energy system designed to provide power for on-site, off-grid use, such as rooftop solar panels or a bespoke wind turbine, rather than relying on traditional grid infrastructure. |
| Buyer | In a PPA agreement, the party that purchases energy generated by renewable energy assets at an agreed rate for an agreed length of time. See also seller. |
| Cap | Within PPAs with a floating price structure that follows a baseload index, the maximum power price that the buyer agrees to pay the seller. See also floor. |
| Capacity | The maximum amount of energy that has been installed and may, theoretically, be generated by a renewable energy system at any given moment. Typically measured in Megawatts (MW). |
| CAPEX | Capital expenditure - the funds used to build a physical asset. |
| Carbon footprint | The quantity of carbon dioxide and other greenhouse gas pollutants emitted by a particular business, institution or individual. |
| Carbon neutral | A business, institution or individual whose carbon emissions are equivalent to the total electricity carbon they use or offset, resulting in no overall net increase in carbon-based emissions. |
| Carbon offset | A way to compensate for carbon-based emissions, generally consisting of a financial contribution towards projects that reduce net emissions. |

| TERMS | DESCRIPTION |
|--------------------------------------|---|
| Contract for Difference (CfD) | In PPAs, a contract between the buyer and seller which stipulates that the difference between the current indexed power price and an agreed strike price will be repaid to the buyer or seller, as appropriate, in order to reduce financial risk arising from price disparities. See also upside risk, downside risk, shape risk. |
| Downside risk | The risk that indexed power prices are lower than an agreed purchase rate. In practice, this means that the buyer might pay above indexed power prices in a long-term PPA. See also upside risk, shape risk. |
| End-user | The party who uses the power produced by a renewable energy system. |
| Energy consumption | The amount of energy used by a consumer, often measured in Kilowatt (kWh) or Megawatt-hours (MWh). |
| Energy efficiency | Reducing energy consumption or loss through increases in efficiency, such as better facility insulation or more modern technologies. |
| Energy independence | The ability to power facilities or on-site processes without relying on electricity from the grid. |
| Floating price structure | An agreement within a PPA to vary power prices, generally based upon indexed prices. This allows the buyer to mitigate downside risk. |
| Floor | Within PPAs with a floating price structure which follows indexed prices, the minimum price that the buyer agrees to pay the seller. See also cap. |
| Green certificate | A tradeable guarantee that power used comes from renewable sources. Typically, a certificate is equivalent to 1MWh, though the schemes vary between countries. These certificates are traded according to government policies that require companies to demonstrate a certain percentage of renewable energy use. This is typically referred to as a Renewable Energy Guarantee of Origin (REGO). |
| Green supply tariffs | A tariff offered by a utility that guarantees energy bought from a supplier is 'matched' by equivalent purchases of renewable energy. This may mean that the supplier buys green certificates, so does not guarantee to the buyer that the energy used is in fact renewable. |
| Hurdle rate: | The minimum rate of return that an equity investor requires for a project to be feasible. For a buyer, this will dictate the lowest power price that a seller can offer a PPA. See also fair value. |

| TERMS | DESCRIPTION |
|---|--|
| Independent Power Producer (IPP) | The owner or operator of a facility that generates electric power for sale to utilities or end users. |
| Indexed price | Power prices that match the current market average. These prices are tracked using different methodologies in different regions, to reflect the varying costs of electricity. When PPA prices are higher than the indexed price, it can lead to downside risk for the buyer. |
| Intermittency | Power sources that do not provide a continuous source of electricity are referred to as 'intermittent'. In the case of renewables, this is often due to inconsistent wind or irradiance. For a buyer, intermittency can be reduced by purchasing a lower percentage of an asset's capacity. |
| Merchant exposure/risk | When generators do not have a PPA and are instead selling power in the market, high power prices make merchant exposure desirable, while low power prices create a risk. |
| Non-Utility Generator (NUG) | See Independent Power Producer. |
| Off-grid | Energy assets not connected to the grid, relying on self-consumption solutions such as rooftop solar, rather than connection to a central grid. See also behind the meter. |
| Off-taker | The party that takes power from a renewable energy system (the offtake). In a physical PPA without a utility partner, this is often the buyer. |
| On-site/Private wire PPA | A PPA in which power is generated by an on-site asset, such as ground mounted or rooftop solar panels. While these assets are often owned by the end-user, they may also be owned by a third party in a PPA agreement. |
| Physical/Sleeved PPA | A PPA in which power is physically delivered to the buyer, either directly from the seller or via a utility partner. In cases in which a utility partner is involved, the utility acts as an intermediary to manage the offtake of power. |
| Power Purchase Agreement (PPA) | A long-term agreement to buy power directly from a generator. There are two main types of PPA – corporate and utility. A corporate PPA is an agreement in which the buyer is a company using power for their own consumption. A utility PPA is an agreement between the renewable energy generator and a regional utility. |
| Price risk | The financial risk incurred to buyers by increases in indexed prices where there is no long-term agreement (such as a PPA) in place, and low subsidy levels. |

| TERMS | DESCRIPTION |
|------------------------------|---|
| Rate of return | The percentage financial gain or loss on an asset over a certain period of time. For a PPA, this will depend on the power price negotiated between the buyer and seller, where the buyer wants to negotiate a low price without dipping below the hurdle rate. |
| Self-consumption | The use of renewable energy systems to provide power for the generator's own use, generally off-grid and behind the meter. |
| Seller | In a PPA agreement, the developer, owner or operator of an asset that generates electricity, which is then sold to the buyer or off-taker. Also referred to as an Independent Power Producer (IPP) or Non-Utility Generator (NUG). |
| Shape risk | Financial risk caused by estimating future power use and buying either too much or too little electricity supply, as electricity can be bought in 'blocks' for a period of time, but electricity usage will vary continuously. In practical terms, this is the financial risk faced in a PPA for a buyer purchasing too much or too little power. |
| Strike price | A power price agreed between the buyer and seller. If the market price goes above or below the strike price, then the buyer or seller agrees to pay the other the difference between market price and strike price. See also Contract for Difference. |
| Upside Risk | The risk that indexed power prices are higher than an agreed purchase rate. In practice, this means that the seller might receive below indexed power prices in a long-term PPA. See also upside risk, shape risk. |
| Utility | An organisation which supplies consumers with electricity through a grid system. Utilities will either own power-producing assets as generators, or engage in an offtake agreement with generators, before selling on to the consumer. |
| Virtual/Synthetic PPA | A PPA in which there is no physical transfer of power; rather, the agreement is financial and relies upon a strike price and Contract for Difference to secure long-term power price certainty. |



**WORKING
WITH
RES**

How can RES help you reap the rewards of renewable energy?

As this guide highlights, a long-term PPA can enable you to meet your decarbonisation goals at a competitive price.

Nonetheless, securing the right PPA for your business can be a complex procedure. For those looking to sign a long-term agreement for renewable energy, RES can work with you to secure the power deal that best matches your energy needs.

To illustrate how RES can benefit energy buyers, here is how we helped Telstra meet its electricity needs.

Telstra tackles rising electricity costs

In early 2017, Australian businesses were facing energy price rises of around 20 percent. Telstra, Australia's largest telecommunications and media company approached RES to discuss PPA options to achieve price security and improved sustainability. Telstra are one of Australia's largest energy users – accounting for around 1 percent of the country's total consumption.

The team at RES were able to draw upon their global market-leading expertise in securing over 1GW of offtake agreements with some of the world's most forward-



thinking companies including General Motors, Google and Microsoft.

RES quickly identified one of their solar projects currently in development that would meet Telstra's energy needs. Emerald Solar farm is located in Queensland, Australia with a 70MW capacity, enough to generate electricity equivalent to supplying 35,000 homes. RES worked closely with Telstra to agree the PPA contract which was signed in May 2017.

James Gerraty, Telstra Energy's former General Manager for Strategy and Commercial, said it had secured long-term supply and price security "well below the current market level".

Australia's first corporate PPA, signed in May 2017, was followed soon afterwards in 2017 when Telstra clubbed together a consortium of Australian corporations to purchase the power from the first phase of Murra Warra wind farm (226MW equivalent to powering 220,000 Australian homes each year). This is located in North West Victoria, Australia and when construction of both phases is complete, will become one of the largest wind farms in the southern hemisphere. In total this wind farm will



The agreement was an important step in enabling Telstra to more actively manage energy consumption and costs, whilst also contributing to reducing emissions and stimulating investment in regional Australia.

Ben Burge, Former Executive
Director of Telstra Energy

reduce greenhouse gases by 900,000 tonnes per year.

The consortium was led by Telstra and included ANZ, Coca-Cola Amatil, the University of Melbourne and Monash University. The PPA contract for Murra Warra included:

- » Energy buyers paying a fixed electricity price throughout contract life;
- » Telstra Energy responsible for large-scale generation certificates, (a form of green certificate) creation and transfer to buyers;
- » Identical contract terms for each buyer, with the exception on the volumes of power and therefore generation certificates;
- » A structure that enables financial hedging for buyers against retail electricity prices.

BENEFITS OF A PPA



SUSTAINABILITY

- Directly supports development of low carbon energy projects. Can demonstrate **additionality**
- Can meet or exceed your sustainability goals (CSR/ESG)
- Ensures ongoing compliance with increasingly stringent emissions legislation



ENERGY SUPPLY

- Provides long-term security of supply (10-25 years)
- Transparent and flexible approach to energy procurement



FINANCE

- A cost-competitive way to meet your sustainability goals
- Fixed price and duration hedges exposure to fluctuating energy prices
- IPP carries the financial risks of operating the renewable energy asset(s)



REPUTATION

- Provides positive PR
- Customers can feel good about using your products and services
- Keep up with or surpass your competition
- Allows companies to meet customer expectations on sustainability practices