Renewable power purchase agreements (PPAs) explained





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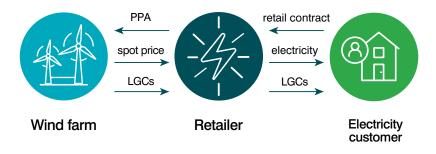
A retail PPA defined

If your business is buying between 500MWh and 50 GWh of electricity a year, negotiating a renewable power purchase agreement (PPA) could be a good option for you. The PPAs we're outling in this document are contracts for electricity and/or green certificates with a renewable energy generator, like a wind or solar farm.

There are 2 main types of PPAs:

- retail PPAs
- wholesale PPAs.

Retail PPA



Under a retail PPA, a business or organisation signs an agreement with an electricity retailer to buy electricity and/ or LGCs. The retailer acts as an intermediary between a renewable energy farm and buyer. The retailer is responsible for negotiating and managing the contract with the renewable energy farm.

For a wholesale PPA, on the other hand, a business or organisation negotiates directly with a renewable energy farm. Wholesale PPAs are usually undertaken by large electricity buyers buying more than 50 GWh a year.

Companies of many sizes can negotiate a PPA. Large corporates like BHP and Woolworths have PPAs as well as small energy buyers such as schools, law firms, financial consultancies and IT companies.

Differences:

Standard electricity contract versus PPA

Standard

- Typically contract term is 1 to 3 years
- Often little room for price negotiation
- Frequent re-contracting exposes your company to price increases more often

Retail PPA

- Bespoke form of standard electricity contract linked to one or more solar or wind farms
- Can offer greater price certainty over a longer period of time
- Contract term is typically 5 to 10 years
- Most businesses engage an energy consultant to help them negotiate a PPA through an electricity retailer. There are currently around 8-10 electricity retailers working in this space

When to buy



The best time to negotiate a retail PPA is before your current electricity contract ends. The retail PPA will replace your current electricity contract. Ideally you would start negotiating a PPA at least 6 months before the end of your existing contract. If you're a medium energy buyer, that buys roughly 10 GWh – 30 GWh a year, you might start negotiating your first PPA 12 months before the end of your existing contract.

Where to buy



Retail PPAs are available from some electricity retailers. Many organisations lack the expertise to work directly with a retailer for a PPA – most use a consultant or broker.

Find a list of retailers.

Find a list of energy and legal consultants who can help you with your renewable energy procurement process.

PPA pricing models

There are many ways retailers can vary price and risk to structure a PPA, but in simple terms, there are 3 main models:

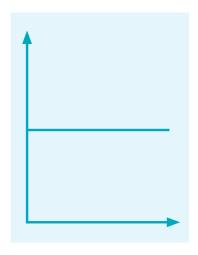
	Fully firmed (fixed price) - least resources required	2 Partially firmed	Spot exposed - most resources required
Price of electricity when the electricity you use matches what you agreed to buy from solar or wind farm	Fixed	Fixed	Fixed
Price for when your electricity use is greater than what you agreed to buy from the solar or wind farm	Fixed	This could involve either: • a fixed price for some periods and the variable spot market price for other periods. For example, off peak times OR • spot exposure and with a hedge or limit. For example, a monthly cap on expenditure	Spot market price
Key ongoing tasks	Minimal change to existing energy practices	Proactive energy management will result in more value	This option requires proactive management of energy use, any solar generation and awareness of changing spot prices to minimise risk and maximise returns
Case study examples	Northern Beaches Council (see page 23)	City of Sydney (see page 23)	Pernod Ricard (see page 24)

Option 1: Fully firmed retail PPA (fixed price)

A fully firmed retail PPA will typically consist of an agreement:

- for the supply of electricity from 1 or more renewable energy farms at a fixed price
- to buy/sell electricity at a fixed price when there is a mismatch between supply (from the renewable energy farms) and demand.

This PPA model may include a long-term fixed price but often includes a formula to reset prices based on the electricity futures market. Your consultant will explain these options to you and recommend the best option for your company.



Pros	PPA model with the highest level of price certainty Less exposure to price increases than the standard retail contract
Cons	Fixed pricing is generally more expensive than other types of PPAs. This is because the retailer will charge a premium to manage the risk of wholesale prices being higher than the agreed price
Ongoing effort	Lower effort – periodic renegotiations
Risks	Electricity prices over time may fall below the rate agreed in the PPA, which would mean you could end up paying more than you would otherwise under a standard contract

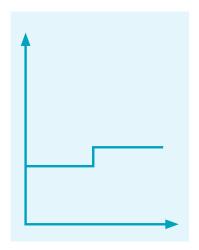
Option 2:

Partially firmed retail PPA (fixed + variable price)

A partially firmed retail PPA will typically consist of an agreement:

- for the supply of electricity from 1 or more renewable energy farms at a fixed price
- to buy/sell electricity when there is a mismatch between supply and demand for a mix of
 fixed and variable pricing. For example, it could include a fixed price for peak periods and
 a spot market price for off-peak periods. Or it could include spot exposure with a hedge or
 limit, like a monthly expenditure cap.

This PPA model can include an option to reset prices based on the energy futures market or a spot market price formula (real time pricing or retrospective pricing). Your consultant will explain these options to you and recommend the best option for your company.



Pros	There is less exposure to electricity price increases than a standard electricity contract Can be cheaper than a fully fixed pricing model. This is especially true if complemented by onsite solar, storage, energy efficiency or demand management to reduce consumption in high-price periods. Can earn significant revenue by selling surplus electricity generated by on-site solar into the wholesale market, through a retailer
Cons	These arrangements may be more complex to negotiate with retailers
Ongoing effort	To get full value, this option requires more proactive energy management and time commitment. It's less attractive to companies that prefer a more 'set-and-forget' option renegotiations
Risks	There is exposure to wholesale price increases, either for particular periods or up to the monthly expenditure cap
	If electricity prices fall below the PPA rate, you may pay more than you would otherwise – albeit less than a fixed price PPA

Option 3:

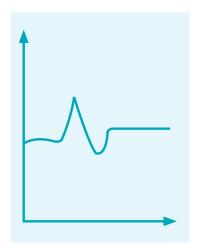
Spot-exposed retail PPA (variable price)

A spot-exposed retail PPA will typically consist of an agreement:

- for the supply of electricity from 1 or more renewable energy farms at a fixed price
- an agreement to buy/sell electricity when there is a mismatch between supply and demand for variable pricing based on the spot market.

For all periods where your electricity use matches the agreed supply (the renewable energy farm output), then the price of electricity equals the agreed price in the PPA.

When your electricity use is lower than the agreed supply, you pay the spot market price. If your electricity use is higher than the agreed supply, you pay the price for excess consumption.



Pros	If you have some flexibility over the timing of your electricity use – or other on-site generation or storage – you can save significant money
Cons	There is greater risk of exposure to periods of very high prices and there can be significant fluctuations in monthly bills. When the retail PPA doesn't account for all the electricity you use, you can be exposed to high-price events
	On the other side, when you're selling excess rooftop solar generation from your site/s, there is the risk of lower revenue if the spot price is low
Ongoing effort	If you go down this path, there is often an organisational journey which leads towards further savings by using other energy and demand management strategies to reduce and shape your times of energy use
	This option is typically used by larger businesses with the incentive and resources for active energy management
Risks	There is a risk of fluctuating bills
	You can implement risk mitigation measures, such as combining wind and solar farms, to improve the load match and additional financial instruments to limit exposure

How to procure: 6 steps

If you're buying around 500 MWh to 5GW of electricity a year, the process could be quite straight forward and take around 3 to 6 months.

If you're buying roughly **5 GWh to 30 GWh** a year, or have organisational complexity, the procurement process is likely to be more formal and extensive. At this scale, a retail PPA can often take 9 to 12 months to negotiate and implement. Depending on market conditions and the availability of renewable projects, it could be longer. These are not hard-and-fast rules.

Step 1: Engage your team



- Develop a project plan, including an internal stakeholder engagement plan.
- Build internal project team and initial internal stakeholder engagement and hold a project inception meeting.
- Use the Business Renewables Centre Australia's (BRCA's)
 diagnostic tool to help you find the best options for your company.

Internal agreement is often the hardest part. Talk with your chief finance officer early as they don't like surprises. But they can be great supporters and help you champion the project.

Remember when you're pitching, the value of a PPA is financial as well as environmental – 'get off the price rollercoaster' by fixing a price for electricity and accelerating your journey to net zero emissions.

Step 2: Build a business case



- Define your key internal drivers. For example, financial certainty and/or emissions reduction.
- Understand your electricity use, including your load profile.
- Develop initial business case for engaging an external consultant.
 For example, preliminary evaluation of alternatives such as standard retail contract, GreenPower, identification of key sensitivities, risks, and mitigation methods.

Understand your load profile

To understand your load profile, you simply need to uncover:

- how much electricity you use. Find the yearly amount in MWh
- when you use electricity how much you typically use at each hour across the day. Find the shape of your load profile across all your sites.

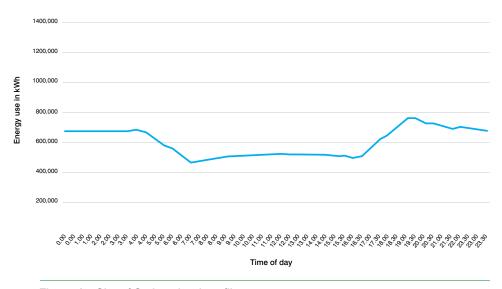


Figure A - City of Sydney load profile - blue line represents the average electricity use by City of Sydney based on more than a year's worth of data

An electricity retailer will aim to structure your PPA to maximise the match between your load profile and the power generated from 1 or more solar and/or wind farms. For example, if you use most of your electricity in the evening, they'll look to structure a PPA where most of your electricity is bought from a wind farm because wind generation is typically higher from late afternoon until the early morning.

This task is called load matching.

Why load matching matters

This can be difficult to understand. Don't get too hung up on understanding the ins and outs.

In short, it helps the stability of Australia's electricity grid – so enough electricity is generated when it is needed. Because electricity is difficult to store. Under a standard electricity contract, electricity providers match the loads of all their customers across their portfolio and the grid.

Following the black line in figure A above, you can see the City of Sydney uses most electricity at night. To reflect this, we structured our PPA so that 75% of the electricity we buy is wind generated and 25% is solar generated.

Our company is risk averse, so should we sign a retail PPA?

All businesses purchasing electricity are already exposed to electricity market price risk. When the electricity market price goes up, your electricity retailer will generally increase the price you pay for electricity as soon as it's possible, depending on your contract. across all your sites.

However, a retail PPA gives you the opportunity to lock-in an agreed price for the 'A' component of the figure B below for a longer term – usually 5, 7 or 10 years – and agree on a price or pricing structure for the rest of your load.

While a longer-term agreement is a difficult adjustment for many organisations, a well-structured retail PPA will reduce electricity price risk in the long run.

The figure below shows how load matching and pricing works using an example of a PPA with a solar farm:

- Where your electricity use matches with the power generation (A), you pay a fixed price as agreed under the PPA.
- Where your electricity use is greater than the amount you agreed to buy from the solar farm (B), you pay a different price – how this price is structured depends on the PPA option you choose.
- Where the power generation is greater than your electricity use (C), the excess is typically sold to the market.

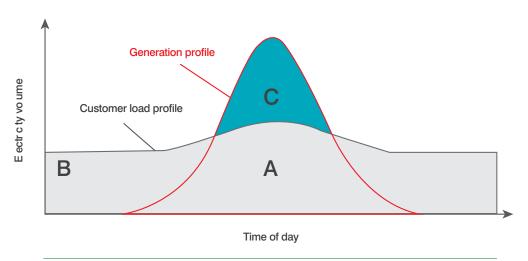


Figure B - Source: Energetics, 2023

Step 3: Engage an energy consultant



An energy consultant can help you evaluate your options, get quotes, advise you throughout the tender and negotiation process, and finalise your deal structure. It's a good idea to get them to quote for their services and decide if you'll proceed with them or if you'll negotiate a PPA directly with an electricity retailer.

To select the best retail PPA option for your company, you'll need to know your company's:

- · electricity use
- · appetite for risk
- preferred PPA pricing model/s.

Step 4: Agree on preferred terms and go to market



After evaluating your PPA options:

- finalise your preferred terms such as length of contract, preferred pricing model and whether you want a deal with one solar or wind farm, or a mix of both
- draw up an agreed tenderer/retailer invitation list
- prepare tender documentation, including an evaluation matrix
- agree on a procurement strategy. For example, 1-stage or 2-stage.
- contact retailers.

The best pricing can generally be found in options where the buyer accepts more of the price risk. So we see higher pricing for fixed price PPAs, and generally lower pricing for partially firmed (variable) and spot exposed pricing PPA models.

Importantly, before you go to market to seek offers, it's a good idea to have in mind which of these options – fixed, partially firmed (variable) or spot exposed – you would prefer, which you could live with, and what your company wouldn't accept.

There is a balance to be made:

- If you're too broad and don't provide enough preference information to retailers, they might not be able to quote, or you might not be able to compare apples with apples when you receive quotes.
- If you're too narrow in your preferences (such as only wanting a 5-year deal or a deal with one specific solar farm), you may not receive many quotes, or you could miss out on the best priced options.

The difference between spot and futures prices

Below you'll see electricity futures prices mentioned. It helps to understand the difference between the electricity spot market and electricity futures prices to understand your company's risk exposure.

Electricity spot prices reflect the current wholesale market cost of electricity determined by supply and demand – it's calculated every 5 minutes. Whereas electricity futures prices predict the cost of electricity at a future date (lock-in a date for future purchasing).

Electricity retailers are subject to these markets when they buy and sell electricity, and in turn use these markets to develop pricing for customers.

An energy consultant will be able to explain this in more detail - where it applies to your business.



Step 5: Comparing options



- Receive and coordinate tender responses, undertake due diligence.
- · Assess tenders using your evaluation matrix.
- Prepare a tender evaluation report.
- Select a preferred supplier and discuss your recommendation with your internal decision makers.

Step 6: Finalising the transaction



- Negotiate fine details of contract, where this is an option.
- Gain legal advice on the contract.
- Execute renewable energy PPA.

Because LGCs need to be 'retired', not on-sold, to be able to claim the renewable energy for emissions accounting, you might need a legal opinion on the contract. If you don't have in-house expertise, your advisor or energy consultant will be able to recommend a suitable lawyer. Not all businesses gain legal advice, but it might be prudent for you.

Group buying

Buying in bulk can cut complexity, time, and costs. Businesses in a PPA buyers group aggregate their electricity use to enhance their buying power.

Benefits:

- More competitive pricing due to greater collective buying power.
- Opportunity for greater renewables impact: by purchasing as a group, you're giving others a way to join and do the same, multiplying your impact.
- · Up-front advisor costs are shared.
- Peer-to-peer learning and support.
- Group deals can amplify your marketing by having a strong announcement as a group of your switch to renewables, you broaden your reach.

Despite its benefits, group buying of renewable electricity in Australia poses challenges due to its emerging nature. This leads to limited established methods, consultant expertise and advisory experience, requiring a more pioneering approach.

Why you might join a buyers group



- Your load is too small to access a PPA by yourself or the business case would be stronger if you could access a lower price.
- You feel you don't have the experience or capability to do this on your own.
- You see benefits in working with others and demonstrating collective impact.
- Collective procurement is often used and is familiar to your organisation.
- You have specific sustainability goals you could achieve more easily as a group, such as supporting the development of a new wind or solar farm in a particular location.

Structures of buyers groups

Group buys have their own facilitation and resourcing complexities, depending on when you join the group and how it has been structured.

The most successful group buy projects generally include organisations that have:

- · a similar size of yearly energy use
- similar cultures and objectives
- · joined forces with 4 to 8 others.

There are notable exceptions to this last trend, such as **Lion and AHA's aggregated PPA**.

Collective decision making

Some buyers groups involve collective decision making from the beginning. Group members might agree on advisor/consultant budgets, selecting advisors, agreeing to request for tender terms and selecting the best PPA.

Lead decision maker

Newer models are emerging where the lead buyer or group facilitator will undertake most of the early scoping process themselves on behalf of the group.

Specific request for tender terms will be decided by the lead buyer upfront. Businesses can request to join the group after these have been established.

The lead buyer or group facilitator seeks quotes based on the request for tender terms and chooses a preferred supplier. Group members are invited to accept the offer.

It's becoming more common for organisations such as councils and industry associations to create second and third buyers' groups after the success of their first group PPA.



Steps of group buying

The steps to develop and execute an aggregated PPA are outlined in this table.

Group buy projects vary in length. GreenPower group purchases can be done relatively quickly, over a few months.

Larger retail PPA projects are likely to take more time. This time is often a function of the representatives from each participating company's ability to effectively build internal support for the project and secure approvals.

	Step	Duration	Description
1	Group formation and MoU	2-4 months	MoU includes agreement on budgeting, governance, and process. May not be required for smaller deals or when working through an existing procurement group
2	Appoint energy and legal advisors	2-4 months	Potentially not required for GreenPower or smaller PPAs
3	Request for tender (RFT) specification	1-2 months	Agree on PPA objectives, whether to support a new or existing project, evaluation criteria, collating and inserting customer energy load information, the importance and type of co-benefits from the project (for example, scholarships for disadvantaged students) and term length
4	Procurement	2-4 months	Issue tender, receive tenders, shortlist, and select preferred tenderer
5	Finalisation	1-2 months	Finalising and signing contract. Agree on communications and marketing

The BRC-A has developed resources to support you throughout this process.

How to find a group

Existing procurement groups

Some organisations already exist to support their industry members with group buying. For example, local governments have joint organisations that perform large scale procurement for road building materials, sustainability advice and other items. Another good example is industry associations that support their members on procurement and sustainability initiatives. Such groups have been used to form buying groups for PPAs.

A sustainability leader

Some groups have formed because an organisation with high sustainability ambitions has led the initiative. For example, the City of Melbourne created the Melbourne Renewable Energy Group which saw 13 organisations sign a PPA. Telstra facilitated a group with Melbourne and Monash Universities, ANZ and Coca Cola.

It's possible there is a group buying project developing now that may suit your organisation. **Register your interest with BRC-A to find out more**.

Renewable energy procurement options

Purchasing type	Key benefit	Key challenges
GreenPower	Pricing - forming a group to buy Greenpower may see better pricing	GreenPower is already available for very small buyers from many providers. Any saving on price may not overcome the effort to buy as a group
Retail PPA – small	Pricing – by forming a group, you may increase your purchase size	Many retailers now offer retail PPAs, even for small buyers. Any saving on price may not overcome the effort to buy as a group
Retail PPA – medium	Additionality – if your organisation uses 10,000 to 40,000 MWh per year, you may not be large enough to contract with a new wind or solar farm. By forming a group you could reach the 50,000-100,000 MWh necessary to sign a PPA that can finance a new solar or wind farm	Finding other group members of similar scale willing to join at the time can be challenging
Large scale PPAs	Impact – even if your organisation can sign a large scale PPA itself and achieve additionality, by bringing other organisations into a group, you can support their renewable energy ambitions, and reserve some of your capacity for future PPAs	Large scale PPAs are complex. Procuring a large scale PPA as a group can take more time or cost

What does additionality mean?

Renewable energy generation that is truly new is considered additional. For example, companies responsible for financially supporting new, expanding, or developing renewable generation sources, as opposed to buying into what is already available or planned, can claim additionality.

Green your supply chain



Many organisations are now looking to reduce emissions caused by their supply chain, also known as scope 3 emissions.

Since your supply chain's scope 2 emissions form part of your scope 3 emissions, forming a renewable electricity buying group with companies along your value chain can help you to address these scope 3 emissions.

This is an emerging area, so if you're interested in this increasingly important leadership topic, keep an eye out at on the **BRCA website** for an upcoming guide on how to do supply chain PPAs.

Tips

- Include group buying within your options analysis when creating a business case for switching to renewable electricity.
- Marketing and communicating your switch can be as important as signing the PPA. Switching to renewable electricity can support your organisation's position as an industry leader and improve your brand equity with clients, customers, employees and other stakeholders.
- Consider whether the benefits of participating in a group will outweigh any costs.

Northern Beaches Council / Fixed price

- Signed a 7-year PPA with a 5-year fixed price period in 2021
- Electricity is sourced from a portfolio of projects including new projects planned to come on-line in coming years – LGCs from a regional NSW wind farm
- At the end of the 5-year fixed price period, Council can extend the deal for another 2 years, with an
 electricity price re-set formula. This could lead to a price increase but includes a lower price for LGCs
- Estimated to save \$1.9m over 7 years. Meets Council's goal of being 100% renewable by 2030 and cutting greenhouse gas emissions by 60% by 2040
- · Council has now commenced a process to lead a group of businesses in a group-buy PPA



City of Sydney Council / Partially firmed price

- Signed a 10-year PPA in 2019
- Most energy used at night (street lighting) so 75% of electricity is bought from a wind farm
- PPA price structure as follows:
 - Where its electricity use matches the amount outlined in the PPA, the City of Sydney pays the agreed price
 - Where its electricity use is greater than the amount outlined in the PPA, the City of Sydney pays the spot price – but only up to a ceiling price. A fixed amount – around 1% of the total invoice cost – is paid monthly to guarantee that, over a quarter, the spot component of its electricity price does not exceed a pre-defined level
 - Where its electricity use is less than the amount outlined in the PPA, the surplus power is sold and the City of Sydney earns revenue based on the spot price in the electricity market
- To further support the stability of Australia's electricity grid and to save money, the City of Sydney is installing batteries and looking at where it can time-shift and/or reduce its electricity use. It aims to increase electricity use in low-demand/low-price times and export surplus power in high demand/high-price times.

Read more about the City of Sydney's PPA.

Pernod Ricard / Spot exposed (variable)

- Second largest wine, spirits and champagne company in the world. Its Australian wine portfolio includes Jacob's Creek, St Hugo, and George Wyndham
- Signed a PPA with Mannum Solar Farm and Clements Gap Wind Farm through electricity retailer, Flow Power, to cover 80% of electricity use in 2019. The remaining 20% of its electricity use is generated by its rooftop solar array. Pernod Ricard pays the spot price for the electricity it buys and earns the spot price for the electricity it exports to the grid
- Spot exposure enables a business with flexible electricity use to use power when the
 price is low and export surplus power for revenue when the price is high. New technologies
 make it increasingly easy to automate onsite power generation and reschedule non-critical
 processes with little to no impact on the core business of the organisation
- Installed a Glaciem thermal energy storage system in 2020, which can be charged and discharged many more times than a Li-ion battery to give it more flexibility



Lion Brewery & Australian Hotels Association

- Signed a 10-year retail PPA in 2020 to enable the construction of a new project, the Silverleaf Solar Farm near Narrabri in NSW
- Lion Brewery was the principal buyer but partnered with the Australian Hotel Association (AHA). Aggregating the load of more than 300 hotels and pubs enabled them to achieve the scale for a competitively priced PPA
- Lion's deal with ENGIE enabled ENGIE's retail arm,
 Simply Energy, to offer the associated deal with AHA member companies
- For the typical NSW pub participating in this deal, electricity cost has dropped from 11.5c/kilowatt-hour to 6.9c/kilowatt hour
- The deal reduced Lion Brewery's carbon emissions by 40%
- <u>View the entertaining promotional video</u> Lion released following the deal
- Lion executed a second PPA in early 2023, bringing it very close to their goal of 100% renewable energy across their Australian operations

Melbourne Renewable Energy Project

- City of Melbourne led the Melbourne Renewable Energy Project (MREP), a group of 14 private and public sector organisations, combining their purchasing power to fund Crowlands 80MW windfarm near Ararat
- The City of Melbourne ran a series of workshops to test interest, form the buyers group and establish the project governance and scope
- An MOU was signed between the 14 buyers to outline 'how we work together'. There was a participant agreement signed that covered roles and responsibilities, cost-sharing and decision-making processes. Participants could withdraw from the process if they weren't satisfied with the tender result
- While the deal was negotiated as a group, each individual buyer signed its own retail PPA

· Load size: 88 GWh a year

Contract term: 10 years

Retailer: Tango Energy

 Buyers included: Bank Australia, NAB, Australia Post, Citywide, Moreland City Council, City of Yarra, City of Port Phillip, City of Melbourne, Next DC, RMIT University, The University of Melbourne, Zoos Victoria, Melbourne Convention and Exhibition Centre, Federation Square



Image: City of Melbourne team, courtesy of Pacific Hydro

Southern Sydney Regional Organisation of Councils

/ Spot exposed (variable)

- The Southern Sydney Regional Organisation of Councils (SSROC) signed their PPA in 2022.
 This included 25 participating councils
- Load size: 214 GWh a year this equates to 83% of the group's total electricity needs across 300 council facilities and more than 3,400 small sites
- Contract term: The initial term of the agreement was 4.5 years with the option of extending for an
 additional 4 years. This provided some load flexibility to the participating councils, which was important
 for deal success given the large number of contracting parties and diversity of sites and facilities involved
- The deal included a portfolio of 3 committed and operating solar farms in NSW near Moree, Nevertire, and Hillston
- Retailer: Zen Energy
- The cost was the same or lower than their existing contracts for fossil-fuel fired power

Handy links:

- Business Renewables Centre-Australia (BRC-A) is Australia's peak corporate PPA training and education initiative. BRC-A is an independent, not-for-profit member-based organisation that connects energy buyers, developers, and service providers. To help you find what renewable electricity procurement options are available to you, use this diagnostic tool from the BRC-A.
- Find a retailer
- Find an energy consultant or broker
- Find legal services

If you have any queries or suggestions on how we could improve this guide, email us at renewableenergy@cityofsydney.nsw.gov.au



