



# Electricity Power Agreements in the Australian Corporate Market

## *Powering Investment in Renewable Energy Circumvent Political and Inflation Uncertainty*

### Introduction

Renewable power purchase agreements (PPAs) that reduce cost, improve cost certainty, engage staff, help reduce carbon emissions, and support the growing financial viability of renewable energy projects, are increasingly taking off in Australia.

Companies are entering long term contracts – or PPAs - to purchase electricity directly from energy generators/suppliers, which locks in agreed pricing over many years and provides financial certainty to all involved.

PPA growth in Australia has tended to come from the not-for-profit sector – cultural institutions, local government, universities – and the mainstream corporate sector – banking, telecommunications, brewing, and grocery retailing, until recently.

Four years ago, renewable PPAs entered Australia's electricity market, and with that, a change in the type of industry seeking energy certainty.

This note reviews the growth of renewable PPAs in Australia, including the first renewable PPA to be negotiated with the iconic Sydney Opera House.

### Renewable Power Purchase Agreements Showing Strong Growth in Australia

Renewable energy generation is a small percentage of total electricity capacity in Australia's National Electricity Market (NEM) at just over 2.5%.

Despite this, renewable PPAs have grown from a virtual standing start four years ago to taking more than 1500 megawatts (MW) of renewable capacity in 2018 (see Figure 1 below).<sup>1</sup> This is a clear reflection of the immediate, material cost savings that can be derived.

The strong growth in renewables - projected to increase by 2-5GW over the next three years<sup>2</sup> - is a key factor supporting the growing financial viability of renewable energy projects in Australia.

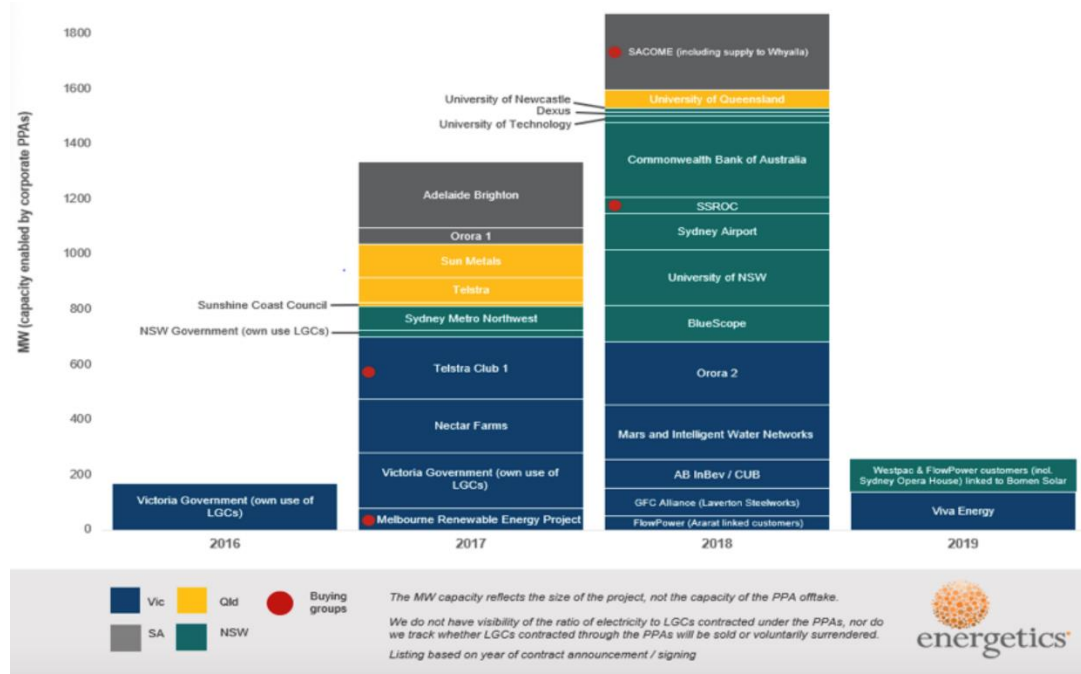
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<sup>1</sup> Energetics, Norton Rose Fulbright and WWF-Australia, [NSW Guide to Corporate Power Purchase Agreements](#).

<sup>2</sup> Business Renewables Centre Australia estimate based on intentions of 60 corporate members.

With more than 14.5GW of capacity in the pipeline<sup>3</sup> at planning or development stage, there is plenty of opportunity for organisations to enter into project-linked PPAs.

**Figure 1: Major Renewable PPAs up to February 2019**



Source: Energetics, February 2019.

In the last two years, organisations across a broad range of industries have implemented renewable PPAs:

Organisation	Energy usage	Supply
BlueScope Steel	20%	133MW Finley Solar Farm 66% of output
Carlton United Breweries	Approaching 100%	112MW Karadoc Solar Farm 74,000 MWh
Commonwealth Bank	66%	270MW Sapphire Wind Farm 96,000 MWh
Sydney Airport	75%	135MW Crudine Ridge Wind Farm And Sapphire Wind Farm
UNSW	100%	255MW Sunraysia Solar Farm 124,000 MWh
Sydney Opera House	100%	Flow Power Retail PPA 85% matched 50% Sapphire Wind Farm 50% Bomen Solar Farm

<sup>3</sup> Clean Energy Council, Clean Energy Australia Report 2019.

Each example in a new sector shows the new way forward for the sector as a whole and demonstrates how renewable PPAs can reduce cost, improve cost certainty, engage staff and help reduce carbon emissions. We consider one example in detail to illustrate.

## Case Study: Sydney Opera House

### *Background and Aims*

The Sydney Opera House is located on Bennelong Point, along with other accommodation, entertainment and tourism attractions, besides Sydney Harbour.

The Sydney Opera House Trust operates the Bennelong Point precinct on behalf of the NSW State Government.

The Sydney Opera House is one of the busiest performing arts centres in the world and Australia's premier tourist attraction. With 10.9 million visitors last year, nearly 1,800 performances in six theatres, ten bars, restaurants and function centres, serving 2.5 million meals and drinks, the Trust operates a \$150 million per annum organisation.

The unique design of the building presents a significant air-conditioning challenge. Utzon and his colleagues designed an innovative system that uses seawater from Sydney Harbour but, like any large building, heating and cooling is the largest source of demand for electricity, comprising around 60% of Sydney Opera House's total requirements.

For many years, Sydney Opera House had a traditional power purchase agreement in place with a major electricity retailer. Pricing certainty had been important for planning purposes so rather than accept the best short-term pricing at the time, management had decided to lock in a fixed price for the term of the agreement. That delivered significant price benefits over the term, as electricity prices rose sharply during the period of the agreement.

In entering the market for a new power purchase agreement, Sydney Opera House decided to explore renewable energy.

As a NSW Government institution, Sydney Opera House could access a whole-of-government energy purchase agreement. They decided against that because their aim was to achieve a comparable pricing outcome – an attractive price but with certainty over a long term – while addressing Sydney Opera House's commitment to reducing its carbon emissions.

Objectives

*Reduced carbon emissions*

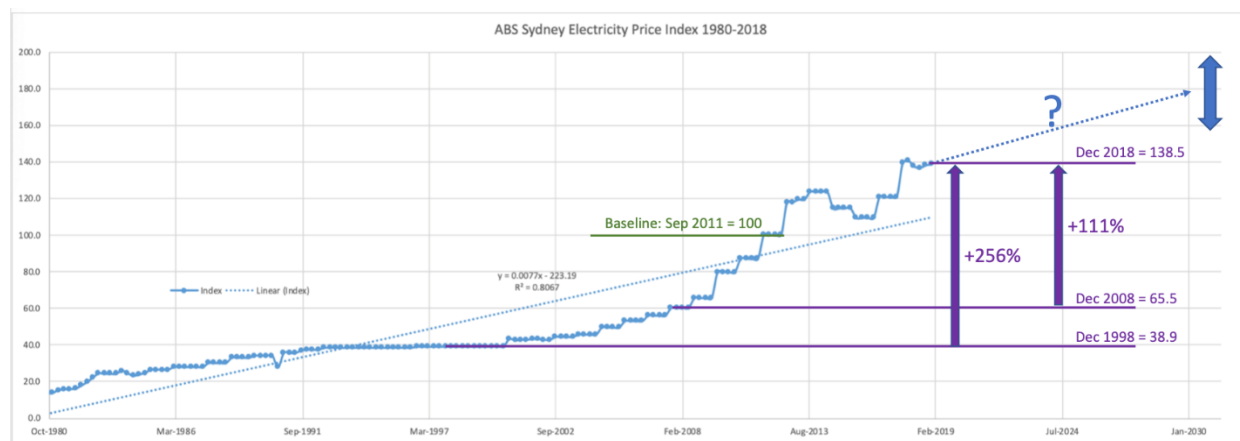
*Pricing certainty over a long period (7-10 years)*

*Comparable to NSW whole-of-government pricing*

It was also important to ensure the volatile electricity prices that Sydney had been experiencing were absorbed into the agreement, to reduce price shock.

The following table<sup>4</sup> in Figure 2 shows the increase in electricity prices in Sydney from 1980 to 2018 and shows the path if this trend continues.

**Figure 2: Trend of Electricity Price Increases in Sydney Set to Continue**



Source: PreSync chart incorporating ABS data.

The long-term upward trend of electricity prices over 20 years and the sharp increase in volatility over the last 5 years demonstrates the financial advantage of locking in attractive pricing in a PPA.

## Process

PreSync, an advisory firm, was engaged to model Sydney Opera House's demand and guide Sydney Opera House through the tendering process.

As part of its overall program to reduce carbon emissions, Sydney Opera House had implemented an energy efficiency program. This resulted in improving efficiency by 14% over 5 years. Lighting systems were changed (e.g. new generation LED lighting was introduced in theatres) and usage was monitored carefully. The major contributor to improved efficiency was the replacement of centralised chiller equipment, delivering a 9% increase in efficiency. Consequently, notwithstanding an increase in activity in the precinct, electricity usage had continued to reduce over time.

The key requirements of the Sydney Opera House tender were:

- 60% or greater matched supply;
- A 7 year term with an option for an extension;

<sup>4</sup> PreSync chart incorporating ABS data.

- Retailer-led PPA; and
- Verification that energy was supply-linked.

Sydney Opera House desired a significant level of matched renewable energy, otherwise there would remain a material requirement for energy from providers other than the supply-linked providers. This would reduce the carbon emission benefits of the arrangement and expose Sydney Opera House to pricing variability. The term was important for planning and budgeting purposes and verification was necessary to have confidence that Sydney Opera House was meeting its sustainability commitments.

### *Deal Structure*

There are several structures for a renewable PPA:

- **Financial PPA** – the buyer and seller agree on a Contract for Difference, to reflect the difference between the negotiated fixed price and the spot price. No renewable energy is delivered to the buyer.
- **Physical or Direct PPA** – the seller delivers renewable directly to the buyer.
- **Renewable Retailer PPA** – a retailer contracts the fixed price and acquires renewable energy from the generator and delivers energy to the buyer.

Sydney Opera House decided to use a renewable retailer to create a supply-linked PPA. This was preferred over other models because Sydney Opera House wanted to have a single arrangement with a retailer rather than multiple contracts or financial derivatives.

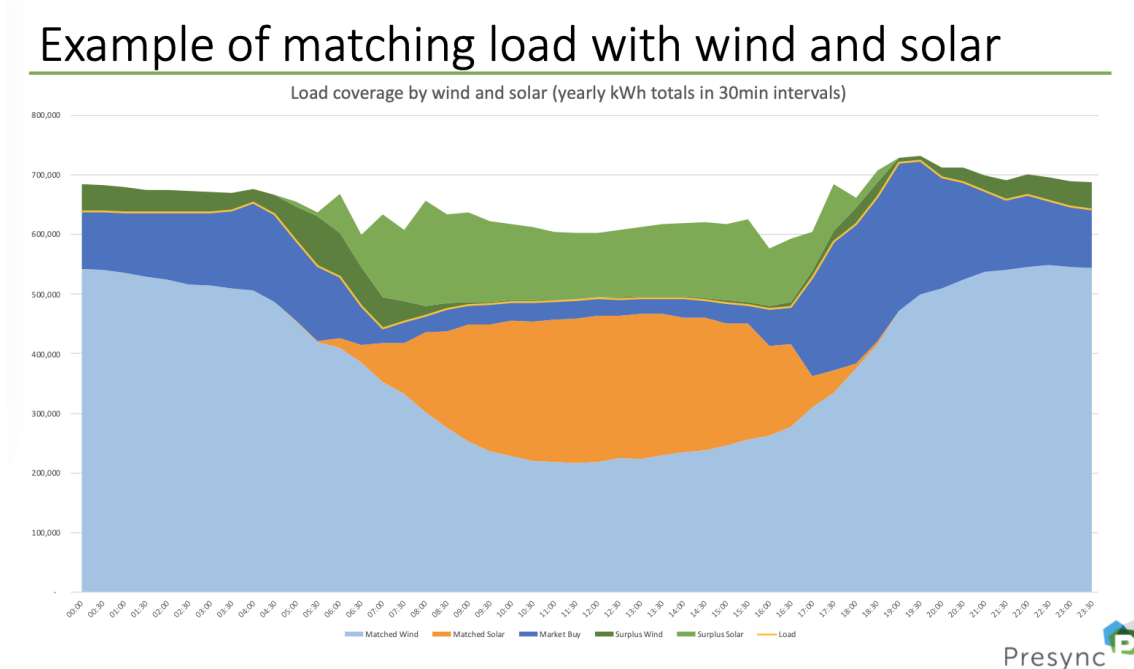
The successful provider was Flow Power. Its proposal was project specific – the [Sapphire Wind Farm](#) in New England and the [Bomen Solar Farm](#) near Wagga Wagga (which will be operational in mid 2020) - to deliver an equivalent amount of renewable energy to that used by Sydney Opera House with an estimate of 85% matched to demand. The term was seven years, with a 3-year option to extend, exercisable by Sydney Opera House.

This kind of PPA does not result in the actual electricity generated by the renewable generators being delivered to and consumed by the customer. The energy is supplied to the grid and the customer buys an equivalent amount of electricity from the retailer. The retailer manages the spot price / PPA price difference in relation to the contracted electricity with a Contract for Difference. Matching is important because any electricity demand that is not matched will be bought at the spot rate, increasing the uncertainty of Sydney Opera House's overall pricing.

The key to a high level of matching is precise demand forecasting. Sydney Opera House had very detailed historical usage information and was aware of the factors that affect electricity demand: principally, high levels of activity in the precinct, which occur in the middle of the day and during the evening (the theatres and hospitality venues have very high utilisation, essentially 363 days per year). Solar

energy is a very good fit for daytime usage and wind contributes in the early morning and in the evening. A 50/50 split between solar and wind was the right combination. Figure 3 shows a typical highly matched solar/wind combination.

**Figure 3: Presync Modelling of Wind and Solar Load Matching**



Source: Presync, 2019.

Sydney Opera House was able to mitigate spot price volatility by contracting a separate ceiling product with the retailer. This increased the price (as the retailer charges a margin for this protection) to a small degree but it reduced Sydney Opera House's exposure to major price rises.

One of the key benefits of renewable PPAs like this is they provide the contractual certainty needed to finance construction and commissioning of generation projects.

Sydney Opera House had already become achieved carbon neutrality through offsetting in September 2018. The new arrangement provides a pathway for Sydney Opera House to meet its future targets of being climate positive, which may include the purchase and retirement of LGCs (Large Generation Certificates).

### Initial Outcomes

The arrangement is on track to meet Sydney Opera House's aims of 85% renewable energy matched to its usage. Solar is expected to provide the majority of electricity during the day, while wind provides generation at other times. The remaining 15% is provided through traditional generation, with protection against large swings in the spot price.

So far, the PPA is generating a modest improvement over the baseline in line with expectations, and with increased certainty over future pricing.

Sydney Opera House has also recently sought expressions of interest to investigate a battery solution that will improve the matching of energy and function as an uninterruptible power supply (UPS).

## Sector Impact

Each corporate agreement in a new sector creates momentum and learning by doing. The City of Sydney recently concluded a renewable PPA based very closely on the Sydney Opera House model.<sup>5</sup> The agreement, reportedly worth \$60m to Flow Power, will match 75% of the City's electricity demand with a mixture of 75% wind from Sapphire Wind Farm and 25% solar from a combination of Bomen Solar Farm and a community project near Nowra, NSW.

Another cultural institution will soon announce its own renewable PPA, adding to an already significant deployment of onsite solar panels. The City of Newcastle<sup>6</sup> has also signed a 10-year PPA with Flow Power, acquiring wind energy from Sapphire Wind Farm.

## Prospects— NSW government

The possibility of widescale uptake of renewable PPAs by the large NSW Government departments would add considerable bulk to overall capacity.

The top four departments by electricity consumption (Education, Justice, Family and Community Services, and Health) used over 233 gigawatt hours (GWh) of electricity in the 2016 financial year (76% of NSW Government and 0.35% of total NSW consumption).<sup>7</sup> The Department of Health alone spends over \$125m on electricity each year. One of the Department's actions in its [2016-23 Resource Energy Efficiency Strategy](#) is to 'Enable renewable energy opportunities.'

Based on the Sydney Opera House case study, renewable PPAs can provide a significant positive impact on both NSW Government department budgets (in terms of both cost reduction and forecasting certainty) and carbon emissions. They would also add jobs in NSW: last year almost 4,500 people were employed in the renewable energy sector in NSW, an increase of 950 from the 2015-16 financial year (ABS figures).

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<sup>5</sup> <https://news.cityofsydney.nsw.gov.au/articles/100-per-cent-renewable-energy-deal-struck-for-the-city>

<sup>6</sup> <https://www.newcastle.nsw.gov.au/Council/News/Latest-News/City-awards-100-per-cent-renewable-contract>

<sup>7</sup> 776 contract – Small sites Electricity Government Expenditure Report 2017



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## Broader Trends

The growth in PPAs is coming from the not-for-profit sector – cultural institutions, local government, universities – and the mainstream corporate sector – banking, telecommunications, brewing, and grocery retailing.

Any organisation with a significant physical footprint can gain financial and emissions reduction benefits from a renewable PPA. The Business Renewables Centre of Australia ([BRC-A](#)) estimates that PPA contributions from its 60 members that are major electricity buyers will generate 2-5GW of demand for renewable capacity in the near term.

However, the vast majority of electricity usage in Australia comes from a small number of highly energy intensive industries. For example, the Tomago aluminium smelter alone (owned by Rio Tinto) consumes 12% of NSW electricity. In fact, leaving aside the coal generation firms, Rio Tinto is far and away the largest emitter of greenhouse gases in Australia, and its aluminium smelters are the largest users of electricity, alongside Alcoa's Portland smelter in Victoria (which consumes more than 8% of Victoria's electricity).

There has been some recent movement among heavy electricity users to embrace renewable PPAs.

[BlueScope Steel](#) signed a seven-year PPA in July 2018 with a consortium including ESCO and Schneider Electric to acquire energy from a 175MW 500,000-panel solar farm in Finley in the NSW Riverina. BlueScope will take 66% of the farm's production, which represents 20% of BlueScope's purchased electricity for Australia, which is a significant step forward to start decarbonising its operations. In November 2018, after the BlueScope PPA commitment, infrastructure investor John Laing Infrastructure Fund, acquired the Finley solar farm.

Also in the steel-making sector, [Gupta Alliance](#) plans 1GW of solar capacity in a bid to create "green steel". This is not a move based purely on environmental motives, but a calculated investment decision to claim the leading position in sustainable steel making for the long term, and a strategy designed to keep up with the rapid growth in investment across Europe in heaving industry [decarbonisation](#). A manufacturer that is not subject to electricity pricing volatility will have a sustained competitive advantage.

This logic was behind [BHP](#)'s decision to transition from coal-fired electricity contracts to renewable energy in Chile in October 2019. BHP is the world's largest copper producer and has signed ten and fifteen year PPAs for 3 terawatt hour (TWh) per annum, with a combination of solar, wind and hydro power.<sup>8</sup>

With Rio Tinto's Australian aluminium operations under sustained cost and emissions pressures – global chief executive (CEO), Jean-Sebastien Jacques, said big increases in power prices have left Rio's three Australian aluminium smelters on "thin ice". The CEO of Rio Tinto's aluminium division, Alf Barrios, issued a blunt

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<sup>8</sup> [Reuters, 21 October 2019.](#)



warning that current prices from coal-fired power were too high: “...power accounts for about a third of the global cost of the smelters and the smelters at Pacific do lack internationally competitive energy prices, which undermines the viability of these assets,” he said. “We are working very closely with the power suppliers and the governments to find a solution to this challenge. I’m not going to speculate on the outcome but clearly the current situation is not sustainable.”<sup>9</sup>

One of Rio Tinto’s aluminium smelters that is under pressure is the Tiwai Point facility in the South Island of New Zealand. It is worth noting that New Zealand electricity prices are not nearly as volatile as Australian prices and have not changed materially in the last few years. The main contributor to Rio Tinto’s high electricity charges at its Tiwai Point facility is the cost of electricity transmissions. According to Electric Kiwi CEO Luke Blincoe, Meridian provides electricity to Tiwai almost at cost.<sup>10</sup> The factor driving the review is more likely the 25% fall in world aluminium prices, caused by a global oversupply.

Miners and large scale manufacturers could significantly insulate themselves against rising electricity prices by committing to long term renewable PPAs. An operation as large as Tomago may need a variety of generation sources, including sufficient firming from pumped hydro storage or gas-fired peaking turbines, but such a huge amount of reliable demand could underwrite massive investment in renewable energy projects in the Tomago region. That in itself would contribute massively to increasing reliability of supply and counteract the closure of the AGL Liddell coal-fired power station in NSW.

When interviewed about Atlassian’s commitment to 100% renewable energy (by 2025), co-CEO Mike Cannon-Brookes said there was a strong business case and positive impact on employee morale (which is important in the “war for talent”). He also noted that [RE100](#) - a global corporate leadership initiative bringing together influential businesses committed to 100% renewable electricity - now had commitments from 7 of the 10 largest ASX listed companies. “The other three might be a little more difficult,” he said, suggesting their business models might put them in opposition to the aim of renewable electricity purchasing.

On the contrary, resources companies have two very strong motivations to embrace renewable energy: electricity is a much more significant input cost to their businesses so they could see huge savings and, at same time, they can show their genuine efforts to address at least some of their contributions to global carbon emissions in the management of their supply chain.

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<sup>9</sup> Guardian, 31 October 2019.

<sup>10</sup> <https://www.stuff.co.nz/business/opinion-analysis/116851413/rio-tintos-tiwai-point-aluminium-smelter--should-it-stay-or-should-it-go>

## Effect on Renewable Energy Sector

Whilst the total amount of renewable energy contracted through PPAs remains small in Australia in the context of total energy usage, it is a critical and growing contributor to investment in the sector.

Increased PPA activity will provide important financing certainty for renewable energy projects and, if the larger energy users (such as BHP and Rio Tinto) start considering renewable PPAs in Australia, investment in large scale renewable projects could open up considerably.

There is literally a wall of patient superannuation capital looking for long term investment opportunities with low risk and reliable yield. Large industry super funds have investigated renewable energy projects (the [Powering Australian Renewables Fund](#), or PARF, a collaboration between AGL, QIC and the Future Fund is a good larger scale example) but in general there are not enough large-scale opportunities to attract that capital.

If large users such as government departments and resources companies considered renewable PPAs, the investment market for large-scale solar and wind projects could improve dramatically.

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