Chris Briggs, Technical Director
Business Renewables Centre Australia

Renewable Energy Power Purchase Agreements, April 2020
Renewable Energy PPAs 101

- Fixed-price agreement with a solar or wind farm
- Electricity and/or green certificates (LGCs) – usually both
- Electricity is supplied through grid – no risk to supply when sun isn’t shining or wind blowing
- Longer-term – usually 10-years+ for a new project
- Shorter terms emerging from retailers (3, 5, 7 years)

Source: Reserve Bank of Australia, March 2020
Renewable PPAs in Australia

PPAs have been signed by Sydney City Council, Google, Apple, Mars, Telstra, Monash Uni, UNSW, Transurban, Shell, Coles, and more.
## Why a Renewable Energy PPA

Buyers often find that combining sustainability and financial benefits is what makes PPAs attractive to CFOs.

### Why

<table>
<thead>
<tr>
<th>1. Sustainability</th>
<th>2. Hedge Value</th>
<th>3. Cost Saving</th>
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<tbody>
<tr>
<td>• Enhance brand</td>
<td>• ‘Lock-in’ acceptable electricity prices to support business operations and planning</td>
<td>• Use a renewable energy PPA to save money</td>
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<td>• Meet green targets</td>
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<td>• Often catalyst for PPA amidst high/rising prices</td>
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<td>• Sustain business value</td>
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### Key point

<table>
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<th>1. Sustainability</th>
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<td>• Strongest case where organisation has sustainability targets</td>
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<td>• PPA’s can achieve ambitious targets quickly</td>
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<th>2. Hedge Value</th>
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<td>• Doing nothing leaves an organisation exposed to wholesale energy market volatility when your retail contract is re-set every 2-3 years</td>
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<th>3. Cost Saving</th>
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<td>• Buyers are achieving cost savings</td>
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<td>• However, lower costs difficult to ‘prove’ because the future in 5 – 10 years is unknown</td>
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Potential cost savings from a PPA

Source: Energetics

Note: this is an illustrative snapshot in time. Savings must be assessed over the life of the agreement and vary from year to year. The graph is for NSW and outcomes will vary for each NEM region. The price of a PPA will vary per transaction based on considerations including technology type, development stage of the project, size of the project and offtake, pricing model.
Wholesale PPAs

- Direct contract with wind/solar farm
- Settled in wholesale electricity market
- No link to retail electricity bill or consumption (financial derivative)
- Typically an option for larger users (50 GWh p.a.+)
  - Lower price
  - It can be simpler for organisations with expertise (or resources to buy expertise) - no third party (retailer)
Retail PPAs

- Retailer holds contract with project
- PPA is integrated into electricity supply agreement
- Attractive for mid-sized buyers (100 MWh – 40/50 GWh p.a.)
  - Retailers negotiates with project
  - Not a financial derivative
  - Integrates with existing billing arrangements
  - Some risk can be transferred to retailer (for a price)
  - Terms vary (3, 5, 7-10 year)
- 8-10 retailers offer PPAs (see guide)
Retail PPA pricing – an example

- fixed price when generation = consumption (A)
- supply for times when generation < consumption (B)
- Price for times when generation > consumption (C)
- Green certificates
Retail PPAs – Options

**Higher price, lower price variability**

**Option 1**
- Standard retail contract with off-site renewable energy
  - Option 1: Fixed price retail contract plus Green-power (no link to RE project)
  - Option 2: Fixed price retail contract plus agreement with retailer or project owner for LGCs (project linked) – sometimes called an LGC-only PPA.
  - Pro: the simplest model (especially if the primary goal is emissions reductions e.g. NABERs rating)
  - Issue: less scope for savings and risk management as a longer-term price is being fixed only for LGCs.
  - Risk: Exposure to future electricity prices which are typically re-set every 2-3 years

**Option 2**
- Retail PPA with ‘full firming’ (fixed price)
  - PPA with retailer linked to RE project(s): fixed-price for output from RE project(s)
  - Fixed price contract with retailer for other times when buyer load is > or < contracted output from RE project(s).
  - Pro: this option combines a RE PPA with a standard retail contract offering higher price certainty.
  - Issue: firming by the retailer comes with additional cost
  - Risk: there are several longer-term offers - but other retailers reset pricing for firming supply every 2-3 years

**Option 3**
- Retail PPA with ‘partial firming’ (some wholesale price exposure)
  - PPA with retailer linked to RE project(s): fixed-price for output from RE project(s)
  - Fixed price contract with retailer for some times when load & project output don’t match (e.g. off-peak)
  - For other times, buyer pays or receives the wholesale price which is passed through by retailer.
  - Pro: savings may be achieved by agreeing to some wholesale price pass-through.
  - Issue: partial firming can be complex to negotiate
  - Risk: greater exposure to wholesale price movements

**Option 4**
- Retail PPA - spot exposure (wholesale price pass-through)
  - PPA with Retailer linked to RE project(s): fixed-price for portion of output from RE project(s)
  - For all times where there is a mis-match between load and the RE project, the buyers receives or pays the wholesale price.
  - Pro: often lower cost option as the retailer is not providing firming. Flexible prices can enable further savings through efficiency and demand management.
  - Issue: more pro-active energy management needed to minimise risk and get benefits
  - Risk: wholesale prices are highly volatile. Buyers choose this option where risk can be reduced by:
    - High match between project output and load (e.g. mixed solar & wind PPA);
    - demand management or on-site generation; or
    - financial risk instruments

**Retailer pricing**

**Wholesale pricing**

**Lower price, higher price variability**
Tenders & PPAs – some tips

- Strike a balance with tender - specific enough for bidders to respond but don’t exclude options or reduce competition
- Ensure the Information you request from bidders is commensurate with the Phase – especially EOI
- Maintain communication with applicants throughout the evaluation process
- Don’t judge a bid solely by its ‘sticker price’ and do due diligence on low bids
- Clarity on LGC requirements and administration
- Matching your Load with the PPA generation should be a high priority
BRC-A Webinar
Retail Renewable PPAs

14 May 2020
General carbon and electricity cost reduction approach

1. Energy efficiency projects
2. On-site low-carbon generation
3. Off-site renewable generation

- Reduce demand...
- Local low-carbon generation...
- Commission off-site renewable generation
Renewable offtake prices in Australia falling

1 Price is the Levelised Cost of Energy (LCOE) derived by the ACT Government, Environment and Sustainable Development Directorate
Retail PPA deal structures

Key considerations:

- Term >=5 years usually, price better at 10 years
- Offtake price will be known for full term
- But unmatched energy adds risk for retailer
- Can firm up; fixed price with retail risk premium, but only for first few years (Option A)
- Can add ceiling, options etc to limit spot price exposure (Option B)
- Some spot market exposure can reduce price but comes with risk (Option C)
Example of matching load with solar only
Example of matching load with wind and solar
# Claims when purchasing renewable electricity

<table>
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<tr>
<th>Carbon Offsets</th>
<th>Greenpower or Wholesale PPA</th>
<th>Electricity purchase + purchase/retire LGCs from project</th>
<th>Electricity purchase from project + purchase/retire LGCs from elsewhere</th>
<th>Electricity purchase from project + carbon offsets</th>
<th>Electricity-only purchase from project</th>
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<tr>
<td></td>
<td>Claim = “Buying Renewable Electricity”</td>
<td>Claim = “Carbon neutral”</td>
<td>Claim = “Support new renewables project to assist in system transition to 100% renewables”</td>
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Thank you
Introducing Flow Power

An overview of our Virtual Generation Agreement

Buying Power Webinar 2: BRC-A launch of the Retail PPA! May 14, 2020
Introducing Virtual Generation

Through our Virtual Generation Agreement (VGA), users:

- Take a portion of their energy from matched wind and solar projects
- Balance of supply sourced from ASX Futures or wholesale
- Excess renewables are sold back into the system

Supports the integration of renewables into the energy system.

And the transition to a net-zero carbon future.
Maximising renewables

We optimise the match between load and renewables to:

+ Maximise consumption of renewables
+ Grade your exposure to the wholesale market for your balance of supply
+ Diversify risk and minimise price variability across multiple sources of wind and solar
+ Matching demand to supply is the most efficient approach to firming.
Future-proofing energy strategies

Our VGA gives organisations the flexibility to:

+ Choose multiple generation sources
+ Flexibility to move between ASX and spot for balance of supply
+ Plug-in additional renewables in the future
+ Incentivise efficiencies needed to drive the right demand-side behaviours and facilitate renewables
Case study: Optimising a renewable strategy

Who: Large NSW-based industrial manufacturer, consuming 190,000MWh pa

What: Wind and solar matched 10-year VGA and energy management strategy

Why: We delivered this solution to...

+ Pair with holistic energy management strategy
+ Enhance value of load flexibility
+ Long-term price visibility
+ Meet global corporate social responsibility goals
+ Align with other environmentally responsible practices within the organisation
Why do we do this?

It’s a holistic solution to drive the right behaviour and create engaged energy users to...

Put them at the centre of the market and create a demand-side solution to...

Drive the transition to a net-zero carbon future.
Retail
Renewable PPA

ENGIE 10-year renewable-backed retail electricity supply agreements

Global website: engie.com
Australia website: engie.com.au
Retail Renewable PPA
Design principles

Complexity kills

Divest risk
“Allocate risks to those most capable of managing them”
Harvard Business Review

Customer-centric
• Comparable
• Competitive
• Common sense

Does it pass the ‘pub test’?
Retail supply agreement structure

<table>
<thead>
<tr>
<th>ORIGINATION</th>
<th>PORTFOLIO MANAGEMENT</th>
<th>RETAIL</th>
<th>DEMAND</th>
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**Market exposure**
- Market prices
- Liquidity
- Portfolio position

**Risk management**
- Flex tolerances
- Customer ‘shape’
- Credit exposure

\[ \text{Electricity Tariff} = \text{Market exposure} + \text{Risk management} \]
• Prices are asset-based, ‘socially distanced’ from wholesale energy market
• Customer load shape is managed with firming capacity, agreed up-front
• Generator portfolio mitigates risk of force majeure or underperformance
Case study: Hawkesbury City Council
Case Study: Hawkesbury City Council

Hawkesbury City Council represents the largest council area in metropolitan Sydney.

“We’ve always known that renewable energy is the power of the future and now the future is here.”
Mayor Barry Calvert

 Council load includes offices, streetlighting, and public facilities (such as libraries and aquatic centres)

Existing energy supply contract expired end 2019

Council engaged Renewable Energy Hub to run a competitive tender process to compare renewable and non-renewable alternatives
Case Study: Hawkesbury City Council

- Single-stage RFP: **engagement to completion under six weeks.**
- **10-year PPA partially firmed** (completely fixed for first five years, fixed + firming mechanism years five-ten). Options also reviewed for five-year and seven-year contract length.
- Compared non-renewable and renewable options to **demonstrate value and promote competitive tension.**
- Undertook scenario analysis and **worked with preferred offer from ENGIE to demonstrate value** and firming mechanism.

**Lesson:** For smaller loads, competitive tender with sufficient flexibility allows retailers to make their most competitive offer.

REH assessed offers with project-specific OR general percentage renewable energy, also non-renewable hedges with LGC.

Wholesale energy prices are down, making Retail PPAs more attractive.

Current energy prices have reduced the cost of firming component in retailer-integrated PPAs. This means now is a good time to hedge against anticipated future energy price rebound and ongoing volatility in the medium to long-term.
Retail Renewable PPA structure

**Origination**
- NEOEN
  - Griffith Solar Farm
  - Parkes Solar Farm

**Firming Capacity**
- ENGIE
  - Silverleaf Solar Farm

**Portfolio**
- ENGIE

**Customer**
- Hawkesbury City Council

**Retail**
- Simply Energy by ENGIE
Retail Renewable PPA structure

- Fixed, confirmed generation volume for duration of agreement
- Guaranteed generation ‘shape’: no risk to run-of-plant exposure to spot price
- Flexible options for firming: can access lowest energy futures prices
Thank you
Melbourne Renewable Energy Project

Principle Partners

Energy Partners
A New Wind Farm: Crowlands

80 MW capacity = 39 wind turbines

140+ Jobs during construction + 8 Jobs Ongoing operation and management of the plant + Opportunities for local businesses
Benefits of a Corporate PPA

1. Emissions reduction and support of renewable energy projects

2. Risk management – Long term price certainty in a changing and volatile market

3. Price benefits

4. Brand and reputation
Why a retail PPA?

1. **Risk appetite** – We wanted our PPA to ‘look and feel’ as close to standard procurement as possible, with similar risk allocation between the parties.

2. **Contract management** – Critical to avoid derivative accounting issues and burdensome contract management (see point 1!)

3. **Scale** – We primarily achieved scale via aggregation, but for small/mid size customers, the ability to contract smaller loads is a key benefit.
Supply Linked Retail PPA - MREP Contractual Structure

Each individual MREP participant

Tripartite agreement

Financier

Loan and security package ($$)

Developer

Internal PPA between related entities

Retailer

LGC SPA

RSA

Each individual MREP participant
How has is worked in practice?

Our PPA has been in operation since 1 January 2019.

A partnership approach with the retailer has been beneficial. Tango have recognised that we’re in a long term relationship and demonstrated willingness to problem solve together.

Contract mechanics have worked as planned (retail price reset)

Some minor teething issues with solar FiT, invoicing, LGC transfer and surrender process, retail service (data access)
Thank you
Opera House

- World’s busiest Performing Arts Centre
- Australia’s premier tourist destination
- 10M visitors annually
- Powerful platform
Our vision

To be as bold and inspiring as the Opera House itself.

Our mission

To treasure and renew the Opera House for future generations of artists, audiences and visitors; and

To inspire, and strengthen the community, in everything we do.
Energy Performance

16% reduction compared to baseline

TARGET 20% by 2023
The Opera House will implement a pathway to become Climate Positive by 2023.

Targets: 13.1, 13.3

Achieve a ‘6 Star’ Green Star performance rating

Implement a pathway to being climate positive by 2023
Why pursue a PPA?
SOH’s Objectives

Support the carbon strategy
  Climate positive by 2023

Reduce risk
  Demand profile is relatively stable
  Lock in long term rates
  Reduce exposure to electricity market

Same or better than BAU financially
The Process

- Concept socialisation
- Market Sounding
- Business Case Modelling
- Approval to proceed to Tender
- Tender Process
- Contract Negotiation
- Board Endorsement
The Tender Specifications

• “Sleeved supply-linked” NSW project
• Off-take 19.8GWh p.a – for optimal match
• Unbundled (electricity rates & LGCs separate)
• Minimum 60% load match
• Minimum 7-Year Term (+ options)
• Demonstrate mitigation of risk (not prescriptive)
The Structure

Sapphire Wind

Licensed
Electricity Retail
(Flow Power)

Bomen Solar

NEM Supply
for any
unmatched electricity
The Agreement

• Two projects - 50:50 mix

• 85% load match - ~15% exposure to wholesale market

• No LGCs (continue to offset to achieve CO2 neutral)

• 7-Year Term + optional 3-Year extension
Load coverage by wind and solar
(yearly Kwh totals in 30 min intervals)
The reality of spot price exposure
Top tips

• Early Executive (CFO) engagement and buy in
• Develop a solid business case against a baseline
• Engage a specialist (aka translator)
• Understand strategies available to mitigate risk