

***Electricity Sourcing:
PPAs, 100% Renewables and Net Carbon
Zero explained***

Frontier Impact Group

Frontier Impact Group provides services to the energy and land sectors focusing on economic and sustainability outcomes.

Provide a range of energy services supporting :

- **Energy Procurement**
- **Energy Efficiency**
- **Independent Solar and Solar Storage advice**

We also have a focus on sustainable projects in the areas of:



Energy: more renewable & efficient energy use



Water: cleaner & more efficient use of water



Air: improving air quality & reducing emissions



Land: more productive & efficient usage

Current Projects include:

- Renewable Diesel
- Renewable Energy
- Energy Efficiency
- Land Restoration
- Organic Fertiliser
- Vertical Farming
- Carbon Farming
- Smart Farming
- Funding Solutions

Breaking Electricity Costs Down

❑ Your electricity bill covers a large number of cost components (whether you see them all or not as line items on your bill)

❑ Energy Charges

❑ Energy Losses

❑ Environmental Certificate Charges

❑ LGCs – regulated mandatory % under RET

❑ STCs - regulated mandatory % under RET

❑ VEECs – regulated mandatory % under VEET

❑ Network Charges (regulated)

❑ NEM Charges

❑ Metering Charges

❑ Retail Service Fees

❑ Retail Profit Margin

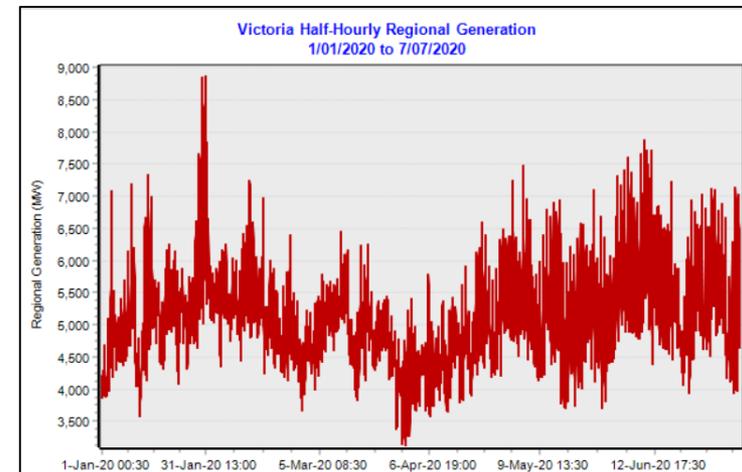
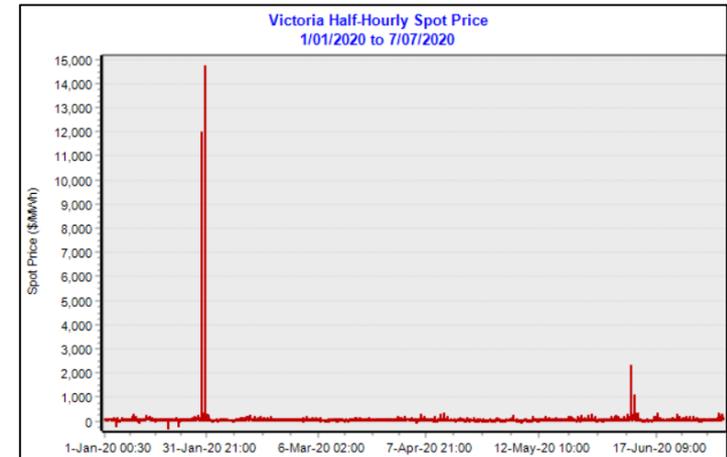
Customer Name	Test Customer	
NMI	Test NMI	
Address	Test Address	
Customer Type (select from list)	Business	

Current Account/1st Offer Details:		
	RETAILER 1	
Peak Energy (Or Flat Energy)	7.857	c/kWh
Off Peak Energy	4.796	c/kWh
Fixed Charge	\$1.99	\$/day
Network Price Pass Through	YES	YES/NO
Non-Summer Demand (or Flat Deman	\$0.00	\$/kVA
Summer Demand	\$0.00	\$/kVA
LGC (LREC) charges	0.674000	c/kWh
STC (LREC) charges	0.967000	c/kWh
VEEC (VREC) charges	0.625000	c/kWh
Metering Charges	\$3.21	\$/day
DLF	1.10000	
TLF/MLF	1.02000	
Solar Retailer Tariff (FIT)	12.000	c/kWh

Alternative Retail Offer Details:		
	RETAILER 2	
Peak Energy (Or Flat Energy)	18.700	c/kWh
Off Peak Energy	18.700	c/kWh
Fixed Charge	\$4.05	\$/day
Network Price Pass Through	NO	YES/NO
Non-Summer Demand (or Flat Deman	\$0.47	\$/kVA
Summer Demand	\$0.24	\$/kVA
LGC (LREC) charges	0.000000	c/kWh
STC (LREC) charges	0.000000	c/kWh
VEEC (VREC) charges	0.000000	c/kWh
Metering Charges	\$0.00	\$/day
DLF	1.10000	
TLF	1.02000	
Solar Retailer Tariff (FIT)	11.500	c/kWh

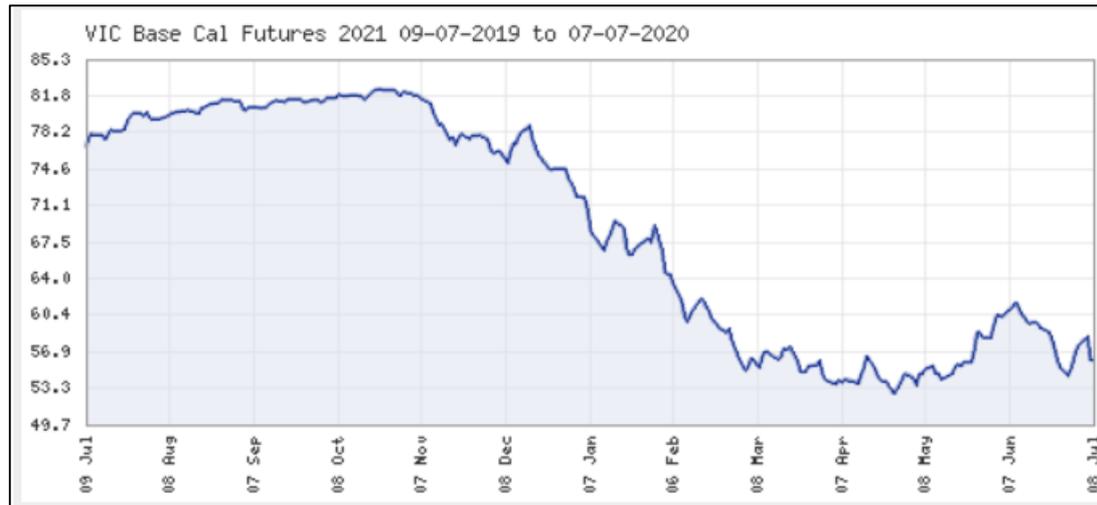
Spot Market for Electricity

- ❑ Electricity Generators produce electricity in the National Electricity Market (NEM) and offer it at various prices into the NEM
- ❑ The supply and demand for electricity sets the spot price every interval (currently every 30 minutes but moving to every 5 minutes)
- ❑ Generators receive the spot price for their output
- ❑ Spot prices can vary from $-\$1000/\text{MWh}$ to nearly $\$15,000/\text{MWh}$ ($-\$1/\text{kWh}$ to $\$15/\text{kWh}$)
- ❑ Electricity retailers are charged for the electricity at the same spot price and then charge their customers a contract negotiated fixed price for that electricity either bundled or unbundled
- ❑ There are some protections in place in Victoria - Victorian Default Offer price



Wholesale Electricity Contracts

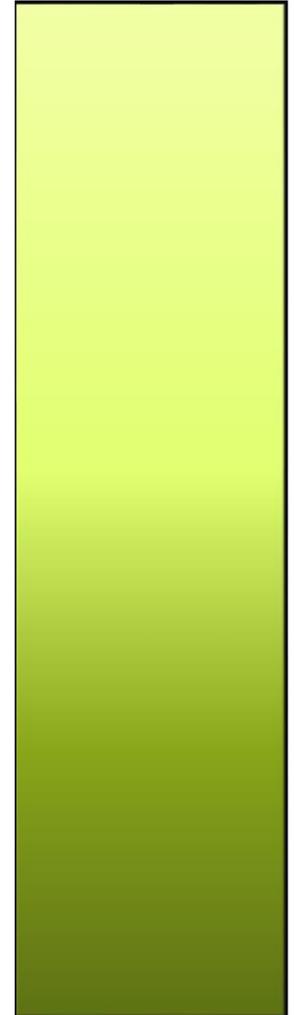
- ❑ Electricity Generators and Retailers hedge their electricity spot exposure using derivatives futures contracts
- ❑ Prices move up and down like any other contracts market



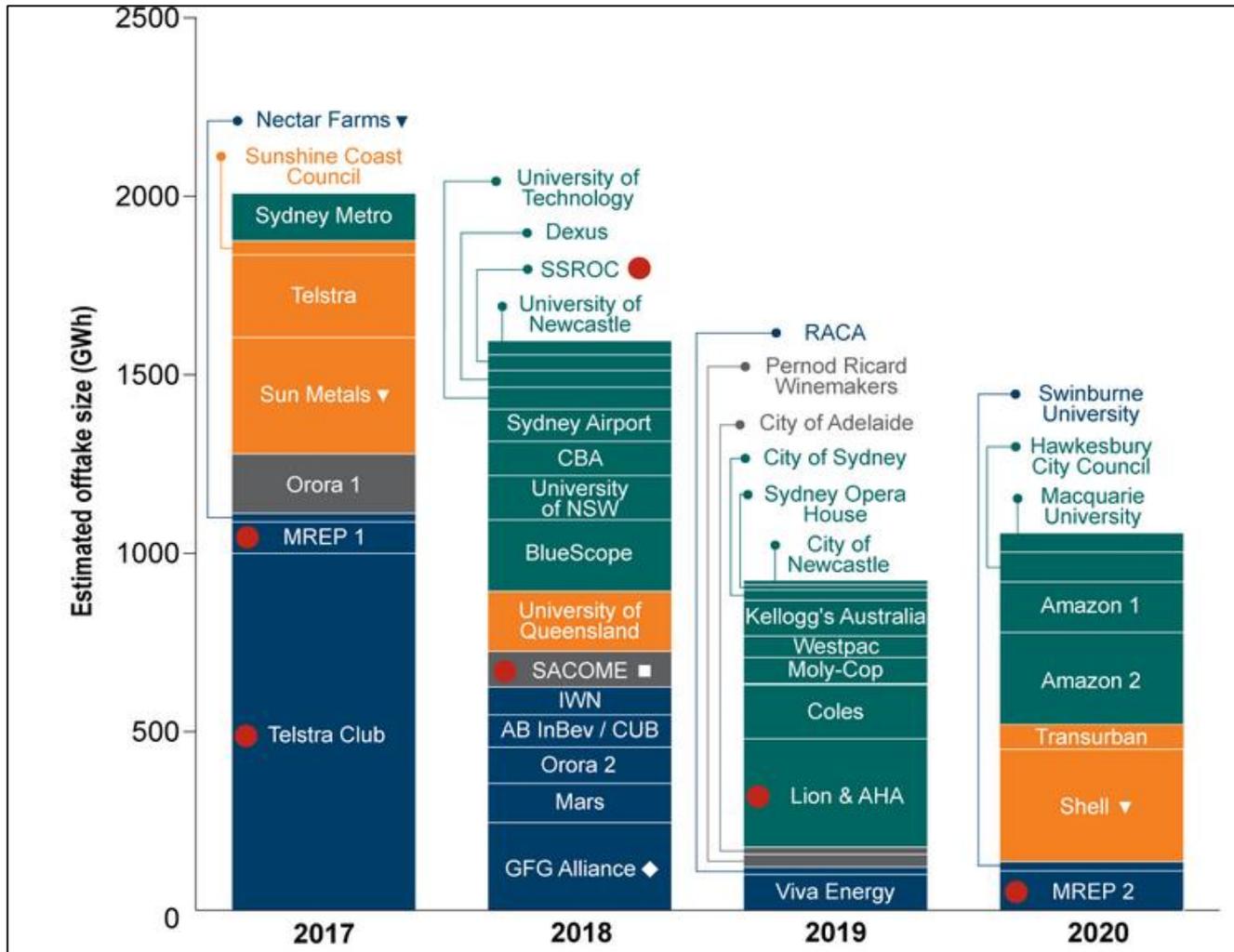
- ❑ Retailers use this as the basis for pricing to their customers

Shades of Green

- ❑ Renewable Power can come from a range of sources including solar, wind, hydro, bioenergy, tidal power, wave energy etc
- ❑ In Australia accredited power stations can produce LGCs (or STCs)
- ❑ Accreditation is based on new generation under the Renewable Energy Target Scheme under the Renewable Energy Act
- ❑ However for example Snowy Hydro and Hydro Tasmania claim renewable energy from hydro sources which may not necessarily be accredited under the RET given they have been in existence for years
- ❑ Some accredited LGC generation activities e.g. burning wood waste in coal fired power stations are considered by some to be not so green and are excluded from schemes such as



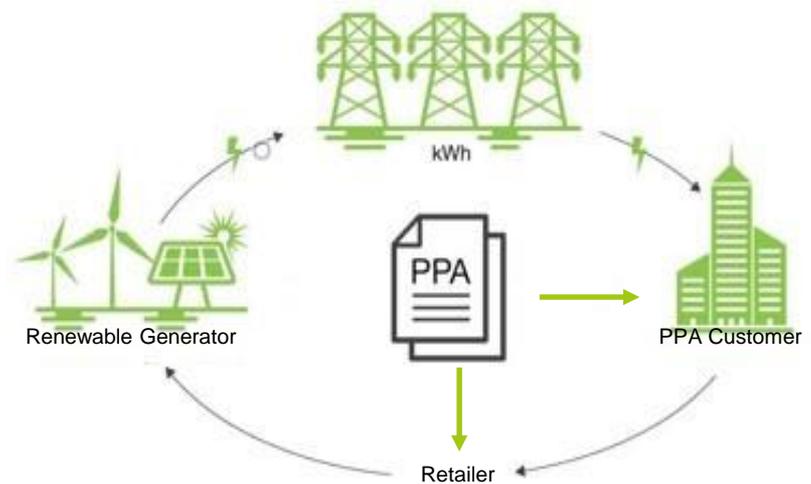
100% Renewables



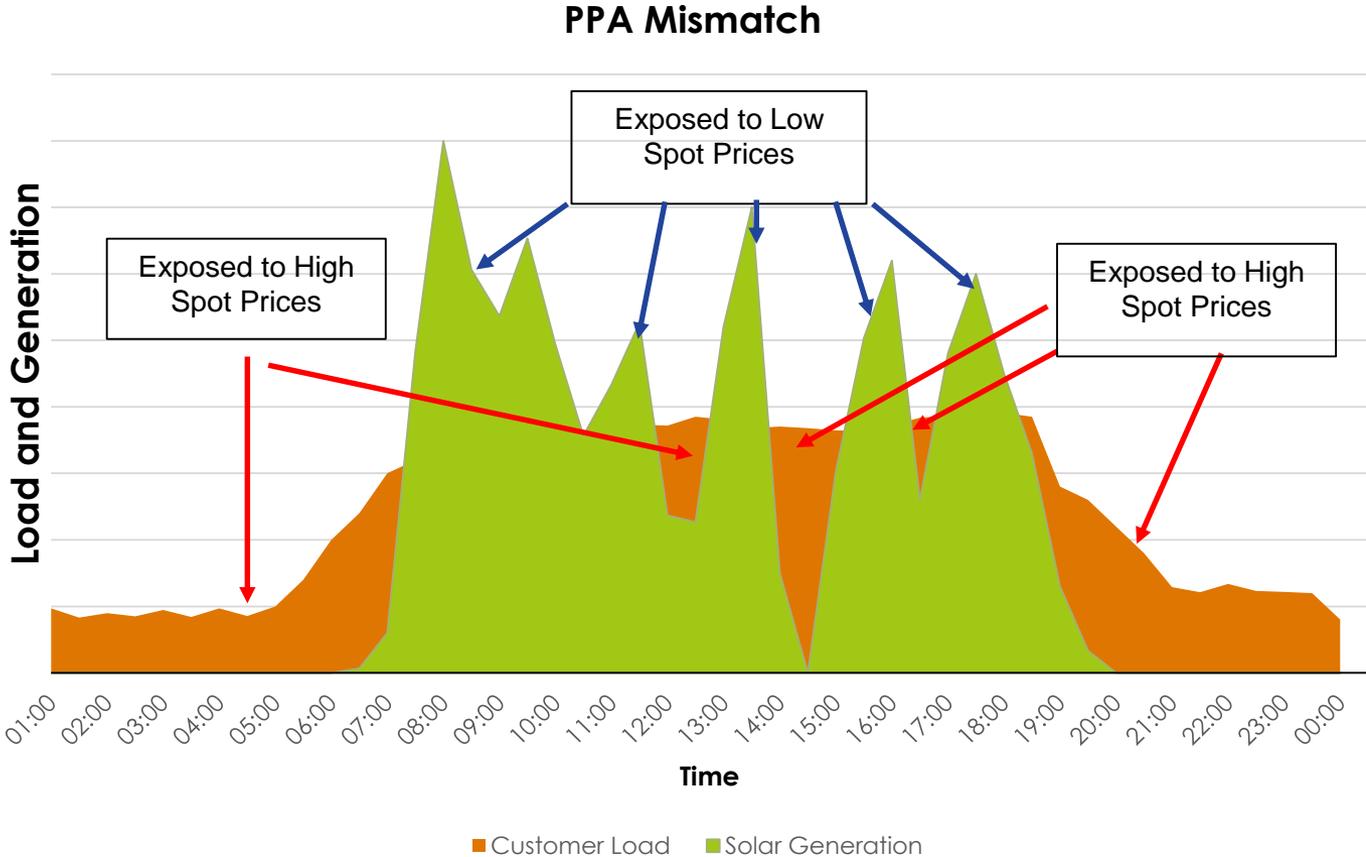
Source: <https://businessrenewables.org.au/deal-tracker/>

PPAs

- ❑ Electricity consumption meters are matched against a percentage of the output of a renewable generation facility or a number of generation facilities meters
- ❑ Because renewable energy production profile is different to that of customer electricity usage profile there are mismatches
- ❑ Mismatches are exposed to spot prices so that customers have some exposure to spot price variability
- ❑ Some retailers may offer solutions to “fill in the gaps” so that “green electrons” being produced match the energy being used at all times – this is generally a more expensive options
- ❑ Need to make sure that you are not “doubling up” on Mandatory LGCs
- ❑ Usually longer term agreements – 5 to 10 years



PPA Mismatch



Non PPA Renewable Energy Structures

- ❑ 100% Renewables does not necessarily equate to PPAs

- ❑ Can incorporate:
 - ❑ Fixed Price Energy structures akin to standard electricity contracts (no price risk)
+
❑ 100% LGCs linked to a particular renewable energy project(s)
Or
 - ❑ 100% LGCs provided from a range of sources
Or
 - ❑ 100% Greenpower linked to an accredited Greenpower scheme
Or
 - ❑ Notional renewable electricity supply without LGCs

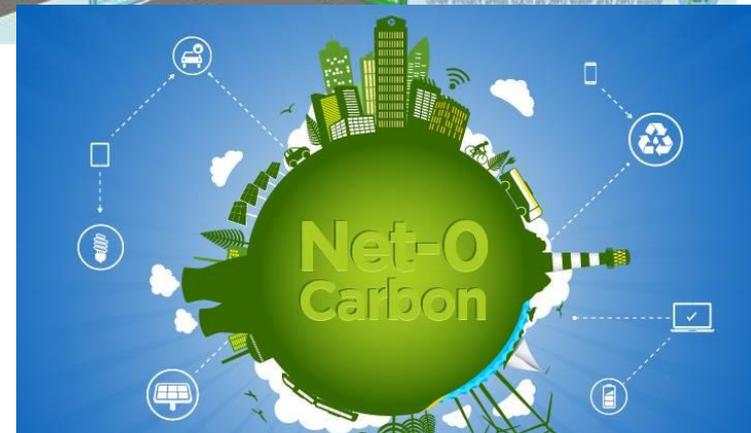


Net Carbon Zero

- ❑ Target to reach a situation where the carbon footprint of a business is reduced/offset to zero net carbon emissions by a certain date
- ❑ Can be achieved by direct actions
 - ❑ Implementing energy efficiency
 - ❑ Purchasing renewable electricity
 - ❑ Using renewable transport fuels

And/or

- ❑ Offsetting emissions through purchase of carbon offsets



An Australian Government Initiative

Summary

- ❑ Renewable PPAs and 100% Renewables cover a large spectrum of energy sourcing initiatives
- ❑ Have different risk and pricing profiles for customers
- ❑ It is important to understand the differences from both a pricing/risk perspective and a communication perspective
- ❑ Net carbon zero extends beyond energy consumption and hence requires additional actions to be achieved

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