

Understanding Australia's Renewable Energy Market

In Australia electricity customers have four options for neutralising the greenhouse emissions associated with their electricity use. These are:

1. Buying Accredited Green Power from their electricity retailer;
2. Buying Renewable Energy Certificates (RECS) from their electricity retailer or a "decoupled" provider;
3. Buying non-accredited green power from electricity retailer; and
4. Buying a greenhouse offset from a private provider.

By utilising any of these options an organisation or individual may claim to offset their greenhouse emissions. However, in reality each of these products differs substantially in the way it reduces greenhouse emissions and in the role it will play in developing Australia's renewable energy market.

1 Accredited Green Power

Accredited Green Power relates to energy sources such as wind, solar, waste to energy and small-scale hydro-electricity plants constructed in Australia since 1997.

To become accredited, the generators must be independently audited through the Green Power Scheme and prove that they are genuine, while retailers are independently audited annually to ensure the electricity they agree to buy on behalf of a customer is actually purchased and is fed into the electricity grid.

The voluntary scheme, administered by the States (in Victoria through Sustainability Victoria), has the primary role of providing assurances to customers that the electricity they are buying is sourced from a greenhouse neutral electricity generator. A secondary role is the development of the Green Power Brand – the Green Tick (see below) – that a company can use to market themselves as environmentally responsible. All of Australia's electricity retailers sell an Accredited Green Power product which allows a customer to pay a premium for the guarantee that all or a set percentage of their electricity is sourced as Accredited Green Power.



2. Renewable Energy Certificates

Buying Renewable Energy Certificates (RECS) is similar to buying Accredited Green Power, and indeed when you buy Accredited Green Power you are effectively getting your electricity retailer to buy RECS on your behalf, but there are distinct differences.

Firstly, The buying and selling of RECs is accredited and administered by the Federal Government in order to track progress towards the Mandatory Renewable Energy Target (MRET). MRET specifies the minimum amount of renewable energy electricity wholesalers must purchase to comply with government legislation (see below for more detail on MRET). As such, the trade in RECs play an important role in driving the growth of Australia's renewable energy industry.

Secondly, RECs have a much broader range of energy generations that it considers to be carbon neutral, including larger scale hydro-electricity, solar hot water and biomass (such as forest waste).

The advantage of RECs are that they give a customer the flexibility to choose exactly where and how their electricity is generated, specify the exact amount the wish to buy, and the freedom to shop around the RECs market to get the best price.

However, when buying RECs, it is important to be aware where the generation is sourced from, as there is conjecture on the environmental benefits of some RECs, such as those sourced from forest waste, deemed from expected solar hot water use or from large hydro. To avoid complications around this it is best to source RECs sourced from Accredited Green Power Products only.

3. Buying non-accredited green power from electricity retailer

This refers to electricity generated from sources that are considered to be greenhouse neutral, but from power generation sources constructed prior to 1997. In the main this refers to hydro-power from Tasmania or the Snowy Mountains. This is electricity often referred to as Renewable Power and may also include power generation that is eligible for RECs, but not account as Accredited Green Power.

Renewable Power is easily confused with Accredited Green Power and many electricity retailers will sell "green" electricity products that are a mixture of both accredited and non-accredited renewable generation. In these cases it is important to be aware of the sources of the electricity generation that are being used to supply the product you are buying.

4. Greenhouse Offsets

This broadly refers to any activity deemed to reduce greenhouse gas emissions in one location to offset the emissions from another. The most common example is the planting of trees to draw carbon dioxide out of the atmosphere, but can also include installing energy efficient products into residential homes or businesses.

A common issue with the purchase of offsets is a lack of transparency around how the offsets are calculated, leaving the actual emissions reduced in question. Further a number of schemes relate to a deemed amount of greenhouse gas being fixed in the future, such as the expected growth of a tree, rather than an actual offset produced in

the past. Such schemes have an inherent risk because there is every chance that bush-fire, drought or logging may destroy or reduce the offset purchase.

The Mandatory Renewable Energy Target

The Federal Government has passed legislation, The Renewable energy (Electricity Act 2000), to set a Mandatory Renewable Energy Target (MRET) to ensure that 10% of the Country's electricity supply, or roughly 9500 Giga Watt Hours (GWH) of Electricity will be produced in Australia from Renewable Energy power stations by 2010. This scheme has recently been expanded so that 20% of the nations electricity supply will come from renewable sources by 2020.

To reach this target, the federal government has mandated that wholesale purchasers of electricity buy a certain percentage of their electricity annually from renewable sources. Each year they are audited by the federal government's Office of the Renewable Energy Regulator and if they fail to buy the amount they are supposed to, they are penalised \$40 for every MWH they fall short. To prove that they have met their target, electricity providers surrender Renewable Energy Certificates (RECs) to the Office of the Renewable Energy Regulator.

The Role of RECs in MRET

For every Mega Watt Hour of renewable energy generated a renewable energy provider can issue a Renewable Energy Certificate (RECs) for sale on the open market. The money for RECs is in addition to money that a renewable energy generator receives for the electricity they generate. As such, RECs and the MRET system allow renewable energy generation to be more cost effective as the producers get to sell both the energy that they produce and RECs. The more demand there is for RECs, either directly or through Green Power, the higher the price and the more attractive it is for business to invest in renewable energy generation.

RECs & Accredited Green Power

As all electricity, renewable and non renewable is feed into a single grid; it is the purchase of RECS that guarantees that you are getting renewable energy. RECs are what your electricity provider purchases on your behalf when you indicate that wish to purchase Accredited Green Power to neutralise the greenhouse gas emissions from your electricity use. RECs can also be bought directly through an approved third party provider (i.e. not a retailer like Origin or AGL).

Current Green Power & REC purchase at the City of Port Phillip

Since Jan 1 2006 CoPP has purchased 10% of its electricity as Green Power for sites under contract with AGL that use in excess of 160 MW per year. These sites are: 1/ South Melbourne Market, 2/ 228 Bank St, 3/ South Melbourne Town Hall, 4/ St Kilda Town Hall, 5/ St Kilda Library, 6/ Betty Day Centre, 7/ The South Melbourne Depot and 8/ Port Melbourne Town Hall. The Green Power product it purchased was a mixture of 90% Accredited Green Power and 10% Renewable Power from older hydro-electricity. This contract expires with AGL expires on July 1 2008. The new electricity supply contract does not include any purchase of Accredited Green Power or Renewable Energy Certificates. It is proposed to continue this 10% Green Power by including in tender process with the un-metered public lighting green power contract.

Since March 2008 CoPP increased its purchase of renewable energy through the purchase of RECS through an accredited third party – Ark Climate. Ark Climate is known as a "decoupled" Accredited Green Power provider. The RECs were equal to the 15% of the total amount of electricity used for Council's Carbon KPI sites (the sites listed above plus the top floor of 228 Bank St and the Albert Park Library), in the 2006/07 financial year. This purchase is in addition to the 10% currently being bought through AGL and brings the total for our large sites to 25%. The RECs were sourced from the Woolnorth Wind Farm in northern Tasmania. This will offset emissions until June 2009.

Future Green Power purchase for un-metered public lighting In the 2008/09 financial year is planned and budgeted for. It is proposed Council purchase 25% of its electricity supply for un-metered public lighting as Accredited Green Power, at a projected cost of \$60,000. This will reduce Council emissions by 1491 tonnes of eCO₂ for the financial year.

Proposed Criteria for evaluating renewable energy supply for Council's metered and unmetered electricity supply

These criteria to be added to the normal process of tender evaluation:

1. Must be sourced from generation that qualifies as Accredited Green Power.
2. Must be purchased through a Licensed Green Power or Renewable Energy Certificate Trader.
3. Preference given to energy that offsets emissions in Victoria.
4. Council to be able to use the Green Power logo in its publications.
5. Renewable energy purchase to be billed monthly.

Projections for Electricity Prices in Australia to 2012

A number of factors point to higher energy prices in Australia over the coming years, including:

- A strong international demand for resources;
- Reduced water supply and higher water prices for energy generation
- Putting a price on carbon under a national emissions trading scheme; and,
- The cost of building electricity generators is rising dramatically because of international demand and a worldwide shortage.

Energy Supply Association of Australia projects that prices will increase by approximately 27% in the next three years, and 50% by 2012.

Year	Average Price per MWh (based on projected price increases)	Scenario 1 – Demand Management 4% reduction in energy use p.a.			Scenario 2 – Without Demand Management & 3% increase in energy use p.a.			Scenario 3 Scenario's 1 & 2 and 25% Green Power purchase				
		Total Expected Usage (MWh)	Projected Annual Cost (\$)	GHG Emissions (eCO2 tonnes)	Total Expected Usage (MWh)	Projected Annual Cost (\$)	GHG Emissions (eCO2 tonnes)	Average Price per MWh (based on projected price increases)	Projected Annual Cost (\$) (with demand management)	GHG Emissions (eCO2 tonnes) (with demand management)	Projected Annual Cost (without demand management)	GHG Emissions (eCO2 tonnes) (without demand management)
2007/08	\$121.93	4,620	\$563,241	6,120	4,960	\$604,311	6,570	\$133.18	\$615,211	4,590	\$660,070	4,930
2008/09	\$146.31	4,440	\$648,854	5,880	5,110	\$746,928	6,770	\$159.81	\$708,723	4,410	\$815,847	5,080
2009/10	\$146.31	4,260	\$622,900	5,640	5,260	\$769,336	6,970	\$159.81	\$680,374	4,230	\$840,322	5,230
2010/11	\$146.31	4,090	\$597,984	5,420	5,420	\$792,416	7,180	\$159.81	\$653,159	4,060	\$865,532	5,390
2011/12	\$182.89	3,920	\$717,580	5,190	5,580	\$1,020,236	7,390	\$199.75	\$783,732	3,900	\$1,114,289	5,550
2012/13	\$182.89	3,770	\$688,877	5,000	5,750	\$1,050,843	7,620	\$199.75	\$752,383	3,750	\$1,147,718	5,710
2013/14	\$182.89	3,620	\$661,322	4,800	5,920	\$1,082,368	7,840	\$199.75	\$722,288	3,600	\$1,182,149	5,880
2015/16	\$182.89	3,470	\$634,869	4,600	6,100	\$1,114,840	8,080	\$199.75	\$693,396	3,450	\$1,217,614	6,060
Total			\$5,135,631	42,650		\$7,181,282	58,420		\$5,609,271	31,990	\$7,843,545	43,830

TABLE 1 Projected Energy Use/ Cost for City of Port Phillip Council Buildings (all metered sites), under stated scenarios

The Table above indicates that with or without green power purchase, demand management actions will be needed to control costs. Given the expected future rise in energy prices, demand management of electricity use from metered electricity use must remain the central strategy for CoPP

Comparison of primary methods to reduce greenhouse emissions at the City of Port Phillip - Price per tonne of Carbon reduction

The question is often raised as to whether it would be more feasible to purchase 100% Accredited Green Power instead of investing in actions that reduce energy consumption. While the purchase of Green Power is an effective way to reduce greenhouse emissions, it is not necessarily a financially sustainable solution. This section explores this proposition as it related to both Council buildings and Unmetered Public Lighting.

1. Green Power vs. Demand Management – Council Buildings

The City of Port Phillip's Sustainable Environment Strategy, Toward Zero identified that demand management would play the primary role in reducing greenhouse gas emissions. Analysis done of the City's buildings shows that the energy use per square metre is roughly double that of what is considered best practice for the provision of services delivered by a given space. This indicates that a 50% reduction in energy use is possible from our metered sites.

The table below shows estimated price per tonne of greenhouse gas abatement of various demand management actions over a 10-year period in comparison to the purchase of renewable energy.

Action	Capital cost (\$)	Annual Saving	Annual GHG (eCO ₂) Abatement (tonnes)	10 year Return (\$)	GHG Abatement over 10 Years (tonnes)	Return per tonne over 10 Years
Lighting retrofit St Kilda Library	\$6,900	\$3,174	22	\$24,840	220	\$112
Lighting controls at Albert Park Library	\$500	\$310	7.5	\$2,600	75	\$34.60
Lighting retrofit at Sth Melbourne Market	\$30,000	\$4,500	50	\$15,000	500	\$30
Lighting retrofit at Ada Mary CC	\$3,500	\$1,050	7.81	\$7,000	78.10	\$89.60
Thermoshield painting of Argyle St Childcare	\$10,000	\$3,000	33	\$20,000	330	\$60.60
25% Green Power/RECS	\$30,000	\$0	679	(\$300,000)	6,790	(\$44.18)

TABLE 2 Comparing Energy Efficiency with the Purchase of Green Power

While it is impossible to calculate the exact costs of implementing all possible actions that will reduce energy use in Council buildings it is clear that over the long term the price per tonne of greenhouse gas reduction is much lower from demand management than it is from the purchase of Green Power.

2. Green Power vs. Demand Management – Unmetered Public Lighting

Public lighting represents 52% of Council's greenhouse emissions, so it is imperative to address emissions from this source if the 2020 carbon neutral goal is to be met.

Historically, the institutional arrangements whereby local government have paid electricity distribution businesses for the service of road lighting have meant that previously the only feasible mechanism for a Council to reduce emissions from public lighting has been the purchase of Green Power. However, rising electricity prices have made this option less affordable in the long term. For example, the City of Manningham has reduced its purchase of Green Power from 100% to 60% in order meet costs associated with higher electricity prices.

The one feasible demand management option open to Council at this time is the replacement of the MV 80 watt lights, that are in use predominately on minor roads, with 28 watt linear fluorescent or 32 watt compact fluorescent lights. Not enough information is currently available to allow proper comparisons of the costs of changing to energy efficient lights against buying Accredited Green Power for the existing lights.

While both of these lights will lead to a substantial decrease in energy costs, the indication has been given that they will also attract higher operation, maintenance and replacement (OMR) costs that will at the least offset and potentially swallow this energy saving. There would also be a one off capital cost associated with this action, the cost of which is yet to be ascertained or assigned.

The City of Port Phillip, like a number of other Councils, has begun negotiation with the electricity distribution businesses that own the streetlights on what the new OMR costs and the cost of change over would be. Council will continue negotiations with the distribution businesses with the goal of securing a fair and reasonable cost for changing to energy efficient street lighting.