



Melbourne
Renewable
Energy
Project

Purchasing renewable energy

Renewable energy can be purchased in a range of different ways. This section covers two very different issues that will determine whether your organisation should consider procuring renewable energy and the contracting model you choose – one is about your objectives, and the other, your electricity consumption.



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CITY OF MELBOURNE

What's driving your organisation?

Your corporate objectives and drivers will be critical in determining the source of your electricity supply and, importantly, the contract structure you adopt. They will support your business case, shape the evaluation criteria in your procurement process, and determine the technology you select. For example, if cost savings are your primary objective, you may opt for the lowest cost project, with a relatively long contract term. This could involve contracting with an existing renewable energy power plant, rather than a new one. Alternatively, a shorter contract term may reduce long-term risk, but come at a slightly higher cost per unit of electricity. And if your organisation has strong connections to a place, you may choose a local project, even if that involves a more costly technology.

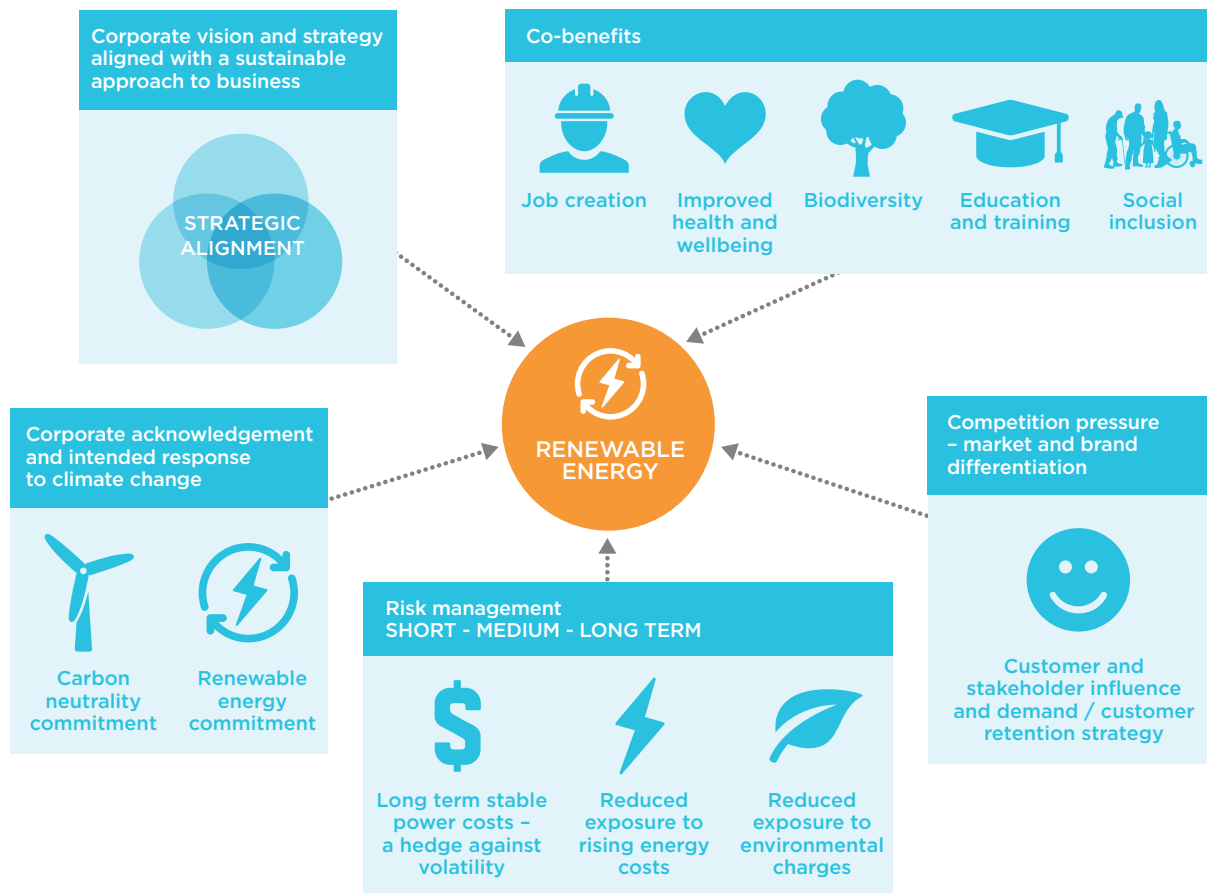
Your corporate drivers will determine answers to the questions below, which in turn, will determine the model you will choose.

- Do you have an interest in securing a stable long-term electricity price, or would you prefer to follow the market?

- Do you want to be the owner of the power plant, or would you prefer that somebody else own and operate the power plant and sell you the electricity?
- Are you aiming to get your electricity from a single identifiable source, or does it not matter if the electricity comes from multiple sources?
- Is it important that the renewable electricity project be a newly constructed project, or can it be sourced from existing power plants?
- Do you require the electricity to be accredited as renewable energy for the purposes of a carbon neutral accreditation?
- Are you prepared to pay a premium to achieve the above objectives, or do you want to achieve the lowest cost?
- Do you have a preferred region for the power plant to be located?
- Do you have a preferred technology (wind, solar, or biomass)?
- Are you interested in being able to talk about additional co-benefits, such as community or educational benefits?

Don't worry if you don't know the answers yet. As you read on, this guide will provide more context for these questions. You can find a more complete discussion of contract options in the section, **Which model is the right model?**

Corporate drivers for purchasing renewable energy



Finding out if renewable energy is important to your organisation

Many organisations have corporate environmental, corporate social responsibility, or clean energy commitments that set priorities for action on energy or greenhouse gas emission reductions. If your organisation has no clear mandate to purchase renewable energy, but you want to understand if it is something you should be doing, a stakeholder engagement and a materiality assessment will help. They are tools to help you determine what is important for the long-term sustainability of your business and provide robust processes to underpin decision-making and action. For more details, see [Building the business model](#).

How to purchase renewable energy

You can buy renewable energy in a number of ways, including installing rooftop solar on your own buildings and buying GreenPower[®] from your electricity retailer. This manual is about how to procure large-scale, off-site, grid-connected renewable energy (as we have done through MREP). While it isn't suited to all organisations, this approach has the potential to significantly change our energy mix and bring down our emissions by driving investment in new renewable energy projects. It also has the potential to provide long-term price certainty and deliver savings to large organisations.

Our electricity is generated by many power stations – including from renewables – and supplied into the grid. It is impossible to identify who is consuming which electrons. But it is possible to buy your electricity in such a way that the amount of electricity consumed by your organisation is fed into the grid from renewables, and not attributed to anybody else. This way, even though your electricity is supplied by the grid, you can legitimately say that your purchase came from a renewable source. It is verified through a renewable energy certificate (REC) system that tracks the amount of clean energy generated ([read more about this under The energy market and renewables](#)).

So to purchase renewable energy, you need to buy LGCs in addition to your electricity. There is an extra cost because it currently costs more to build a new renewable power plant than it does to sell electricity from an existing coal-fired power station that has been fully depreciated. When you buy GreenPower[®] from your electricity retailer, your retailer purchases and surrenders LGCs on your behalf.

What is a Power Purchase Agreement?

Put simply, a PPA or 'offtake' agreement is a contract between an electricity buyer and an electricity generator. The agreement can take several forms, and can provide both parties with certainty about price over a long period. In relation to renewable energy, a PPA can refer to a contract to purchase electricity from a specific project, or renewable energy certificates, or both. They can be signed with an existing power plant, or one yet to be constructed. PPAs are routinely used in the electricity wholesale markets between retailers and generators. PPAs can also be used to finance on-site solar PV systems. However, in this report a PPA refers to a transaction between an off-site renewable energy generator and a corporate energy user - with the involvement of an intermediary such as a retailer to facilitate the supply of electricity; or directly without the involvement of a retailer.⁶

The PPA you choose will be determined by your corporate objectives. They can involve a set amount of electricity each year, or a varying amount, such as the amount consumed or generated at a certain meter.

In most instances a direct contract, without a retailer, will be a contract for difference (CFD), also referred to as a Financial PPA. This is a financial product used to hedge against electricity price increases and volatility. Customers will still need to enter into a separate contract with a retailer for the supply of electricity. For more information about this approach see the section, [Contracts for difference](#).

New renewable energy projects need revenue certainty. That's why PPAs can be critical to the development of new renewables – they provide the investor or financier with the certainty required to proceed with the investment. PPAs range in length from about 10 to 25 years; the longer terms are more common. Longer terms involve lower prices because the revenue needed to pay off the power plant can be spread over a longer period. So, for electricity consumers, PPAs can offer significant cost savings compared to short-term electricity purchasing contracts.

TIP:

Long term PPAs may not suit organisations with highly variable electricity needs – for example, organisations that have a frequently changing property portfolio. Such organisations may still consider an agreement to purchase Large Scale Generation Certificates, which can be traded on if necessary, consider CFDs or set the contract at a smaller volume to reflect their expected minimum consumption.

6. For more information about PPAs in general, see this report by Baker McKenzie, 'The Rise of Corporate PPAs': www.bakermckenzie.com/en/insight/publications/2015/12/the-rise-of-corporate-ppas/

Customers who wish to enter into a PPA should:

- be creditworthy
- have relatively stable electricity needs and be likely to exist over a 10 to 15 year timeframe
- be able to commit to a minimum demand over this same period
- have a sizable electricity demand.

In general, MREP participants did not start out with detailed knowledge about renewable energy PPAs. The development of these agreements within the Australian regulatory framework were also new to many advisors, including legal, procurement, probity and energy market consultants. We needed to develop our understanding of the complexities at each step, particularly in trying to meet mixed needs. Advisors and consultants will become more familiar with corporate PPAs and be better able to assist as they become more common.

Key staff implementing the project were sustainability professionals or facilities managers. They called on input from communications, procurement and legal staff as the project reached important milestones. MREP particularly relied on champions within each organisation to maintain momentum and overcome strategic barriers.

KEY LESSON: Take the time to identify the specialist resources you will be able to call upon, and make sure your organisation - and any partners - really understand what it means to enter into long-term renewable energy procurement agreements.

How much electricity consumption will support a renewable energy project?

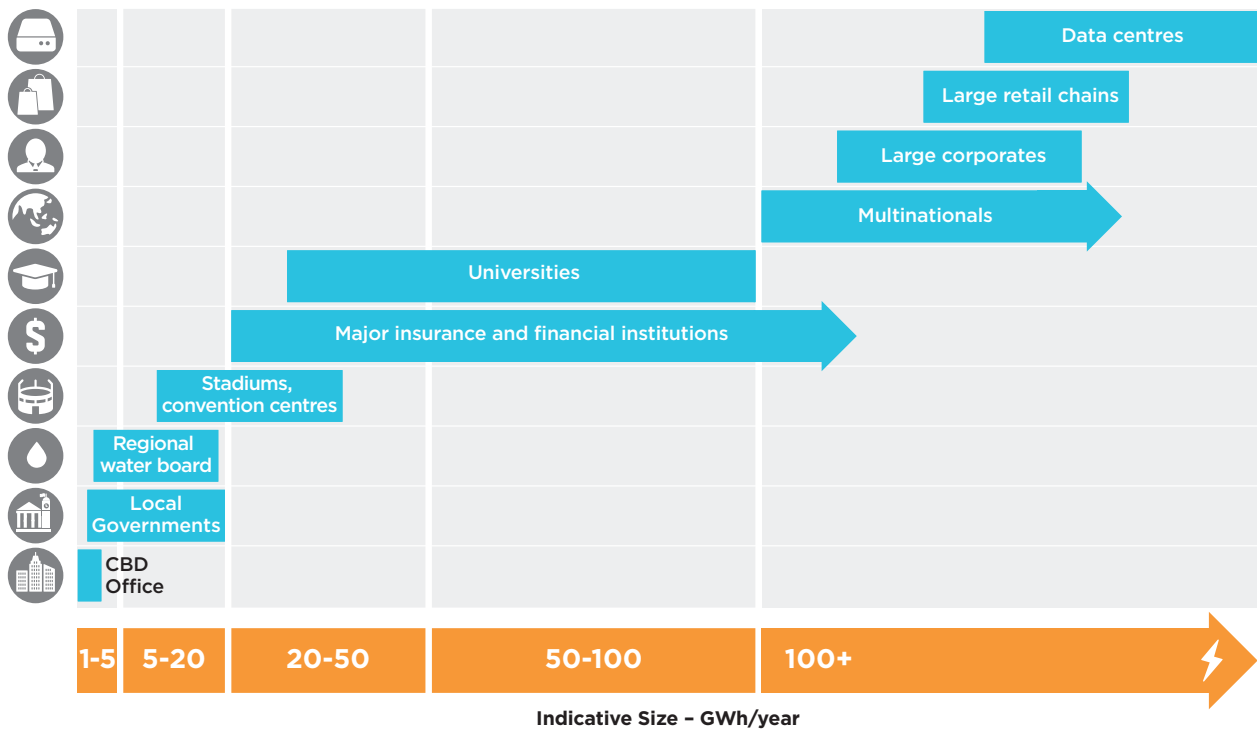
You need to understand your electricity load needs, and match these to a power plant.

The volume of electricity required to support a new project will determine whether or not a PPA could work for you, whether or not you need partners, and which type of renewable energy project suits best.

To decide if a PPA suits your organisation, first consider on-site or 'behind the meter' renewable energy. Solar systems can be scaled down to fit on a rooftop. If your electricity demand is small enough and your rooftops are large enough you may not need to source your renewable electricity from off-site sources. But if your organisation's energy consumption is large and you don't have sufficient roof space or available land, on-site solar will not cover your electricity needs. A large-scale off-site project may be a viable option.

The smaller your organisation and the less energy you require, the smaller the power plant you will be able to support. If you consume less than 25 to 50 GWh/year, partnering with other organisations may be the most effective way to underwrite the development of a new power plant. The larger you are and the more electricity demand you are prepared to commit, the fewer partners you would need, and you may be able to enter into a PPA on your own.

Indicative consumption needs by type of organisation



What are MW and MWh's?

Megawatts (MW) are a measure of power (millions of joules per second) and relate to the capacity of a power station to produce electricity. Megawatt hours (MWh) are a measure of energy over time. (On a typical electricity bill you will see kilowatt hours (kWh): 1,000,000 kWh = 1,000 MWh = 1 GWh.)

For example, 1 MW of electrical power running at full capacity (100 per cent) over a year (8760 hours) will produce 8760 MWh, or 8.76 GWh.

What does 'capacity factor' mean?

When you start undertaking research, you'll encounter the term 'capacity factor'. There are a number of variables that determine whether or not a power station will operate at full capacity. A solar farm, for example, can only operate at full capacity during daylight hours. Other factors such as latitude, temperature, shading, cloud cover and the quality of the panels also influence generating capacity. On average, a solar farm has a capacity factor of 20 to 25 per cent - meaning that it generates up to one quarter of its total potential output. So if you have a 1MW solar farm operating at 25 per cent capacity, it will generate 2.2 GWh (1MW x 365 x 24 hours x 25 per cent = 2,190,000 kWhs per year).

By comparison wind farms may have a capacity factor of around 35 per cent and can range from 25 to 45 per cent, depending on the location. Wind farm capacity factors are lower than coal and baseload gas plants, but when the wind is blowing they use their energy source more efficiently.⁷

The scale of the project may determine your technology type. Wind farms tend to require a larger scale development and will require a larger electricity purchase in order to support their development. The smallest commercial wind farm built in Australia in recent years is a 20 MW project at Coonooer Bridge, near Bendigo. Its six turbines generate an annual electricity output of about 78,000 MWh.

Historically in Australia, wind farms have been able to deliver electricity at lower cost than solar, but this is changing. Recent utility-scale solar farm developments in Australia have been in the range of 10MW to 100MW, with annual outputs of starting at 24 GWh. Solar projects can be developed at smaller scales - 1MW or smaller - and consequently, can work with smaller contractual load commitments.

However, there are efficiencies of scale with larger plants. This will often be reflected in higher prices. Be aware of these trade-offs when deciding whether to go it alone, or to partner with other organisations as you decide on the scale of your project.

At the time of developing our tender, the MREP group determined that an offtake agreement for 100 GWh per annum was required to underpin a new renewable energy project. This was based on the electricity output from a relatively small wind farm. Since then, technology and associated project costs have fallen significantly, particularly in the case of solar. The economics will vary depending on the size and location of a potential project and the amount of generation produced, as well as the the costs of connecting to the grid, acquiring land, obtaining finance and project development. A competitive procurement process will test the relative economics of projects and the cost your organisation will pay for electricity and LGCs.

⁷ Sources: <https://www.wind-watch.org/faq-output.php> and www.environment.nsw.gov.au/resources/households/WindEnergyfactsheet.pdf



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