

THE POWER OF SOLAR ENERGY

Here at Electric for Everyone (E4E), we believe that when it comes to generating electricity, solar energy is the closest thing to magic you'll find. Known as Photovoltaic (PV) solar generation, solar panels take the sun's energy and convert it into electricity, and lots of it! Once installed, panels provide free power for approximately 25 years, and with no moving parts, very little maintenance is required. Over the past decade, the cost of installing solar panels has come down over 90%, plus the efficiency has improved considerably. Solar panels are already the cheapest form of electricity generation, and the installation price is expected to reduce even further.

How much energy do solar panels produce?

Using an existing installation in Dunedin as an example, a typical 5KW system might comprise of 12 panels (total area 20m²), with total annual power generation of around 5000kWhr, or an average of 13.7kW per day for the entire year. For instance, peak generation is around 32kWhr for a sunny day in summer, and 12.4kWhr on a sunny day in winter. On a rainy-day, production is reduced, but there are very few days that don't produce at least 5kWhr. This output would be enough to drive an efficient electric car 100km per day, and at 26c/kWh it has an annual value of approximately \$1,300 or \$32,500 over 25 years. At an installation cost of between \$10,000 and \$20,000, this makes solar panels a good investment.

Things To Consider

While the cost and power generation make solar financially viable, the important thing is to have a lifestyle that either uses the power directly, or you have a way of storing it. While you can sell excess power back to the grid, the buyback rate is around 7c/kWh or 25% of what you buy it for, so it is much more worthwhile to use it if you can.

The Future

Home solar power has the potential to supply a significant portion of power to the National Grid where it provides renewable energy for everyone to use. In countries such as Australia where there has been a good uptake of solar panels, half of all electricity generated comes from rooftop solar! Here in New Zealand, if pay back tariffs were increased and the cost of installation was reduced so that a system would be a good investment, then there would be no need to worry about home storage solutions. Unfortunately, home installations will always be more expensive than large scale solar farms, so this is not likely to happen.

If, however home battery and solar are combined in a way that allows for grid management at peak times, there may be scope to reduce day long grid tariffs for the system to make adequate savings.

A more likely future is that the cost of solar and batteries are reduced to the point that there is no doubt they are good value, and the automated home energy management systems operate at maximum efficiency without the need to monitor use and change settings.

Three ways to maximise solar power generation:

- 1) Having a demand similar to, or more than what is being generated. In commercial situations, or with a home or home office that uses significant power even on warm sunny days, this can work well. However, if you are not at home during day, it is hard to use the excess solar supply. In this case you would send much of the excess back to the grid.
- 2) If you have an EV car and you are able to charge it during the day, this is a great way of using excess solar power. There are chargers and apps that will only send any excess solar power directly to the car's charging station, so it only charges using 'free' solar electricity. However, if you are out and about during the day, and you are on a low cost overnight tariff to charge your EV, then you are substituting solar energy for low-cost energy.
- 3) Home battery storage. This is by far the best way to maximise the way your solar energy is used. This allows 'free' solar energy stored during the day to be used in place of peak electricity used later in the day and in the evening. However, it does considerably add to the cost of the system, and can be a complex process to get set up and controlled so it maximises both solar and low-cost energy winter and summer energy.

How can E4E help?

E4E would offer you advice on gathering the following information:

- Your proposed site, location, orientation, construction
- Power options from potential suppliers,
- Doing an audit of your existing power use, when and how much power is being used,
- Future potential power usage (such as EV car or heat pump)
- Options to fund the work.

From here, E4E will be able to advise how to best progress. Options may include waiting for costs to come down, to slowly installing parts of the system, to getting detailed prices for a full installation will be presented.

ELECTRIC for EVERYONE!

Helping you transition to a low carbon future, and save!

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