

# Energy in a Changing Climate

## THINK TWICE BEFORE GOING OFF-GRID

As domestic electricity prices are increasing, there is more and more discussion about going “off-grid”.

Assuming that you want to maintain a reliable electricity supply to your home or business, then to go off-grid means you have to replace your electricity supply with an alternative. A decade ago that might have been small generators running off motor fuel. Using this option in urban areas would not go down well with the neighbours or the environment.

The popular alternative today is to install solar panels on the roof of your home or business and generate the electricity when the sun is shining. With enough solar panels it is possible (weather permitting) to generate all the electricity you need during the daytime.

To supply the rest of the day you would need to save any excess energy from the solar panels so you can use that electricity when the panels are no longer generating power. The popular way of saving this energy is to install batteries with your solar panel system so the excess power generated can be used to keep the batteries charged rather than passing it onto the grid. These batteries can supply the electricity needed at night and in bad weather.

The size of the panels and the storage size of the batteries depends on your regular power usage and the amount of sunlight you receive over the year. This, in turn, depends on the location of the building, physically and geographically.

Solar panels and batteries are not cheap and don't last forever. You might only get 10-15 years' usage out of your system, so you need to make sure the total cost covers the cost of your grid electricity over those years. plus the interest you might have earned on the money spent on the panels and batteries.

### **Let me tell you about my experience with solar and batteries.**

In 2006 we relocated from Melbourne to live in the northern rivers area of far north NSW. We chose to live in a rural area near Mullumbimby. (No we are not hippies).

Back then the electricity supply in that area was somewhat problematic. This was before the so called “network gold plating” had been applied to this area. It is an area prone to very heavy rainfall (about 3 times that of Melbourne) plus fierce electrical storms that can play havoc with transmission lines. Blackouts were regular, and I liked the idea of not being at the beck and call of the local electricity distributor.

According to my retailer [Origin Energy](#) my house should have a 5kW solar array at a likely cost of \$9,000 according to [Solar Choice](#). Unfortunately, I didn't have sufficient suitable roof area for a 5kW system.

[AGL](#) recommend a 12 kWh battery for a 5kW solar system at a cost of around \$15,000. So the total capital cost for the 5kW system with battery would have been \$24,000 including installation.

So in 2008, I invested \$13,000 in a more modest PV system with lead-acid batteries. In those days the NSW government applied rebates for such systems so it only really cost me \$5,000. Lead-acid batteries (like those used in motor vehicles) require regular maintenance ensuring the acid levels are

kept topped up and connectors kept clean. Apart from that, the system was terrific! While neighbours had candles in their windows at night because of a blackout, we had a fully functioning electricity system.

My annual electricity usage cost, excluding the supply charge, was about \$2,100 per year. So as long as the 5kW solar system lasted for 11 years without any costly maintenance and ignoring the time value of money, then it would have been a breakeven deal.

My more modest solar system worked well for the first two years when the inverter packed up. The inverter converts the DC voltage from the solar panels and batteries to usable AC for the house supply. It is the most important part of the system, so without it my solar and battery systems was useless. It took 28 days for the supplier to obtain a new inverter from Germany and install it. Fortunately, we were still connected to the grid and, also fortunately, there weren't any blackouts during that period.

If we had gone off-grid we would have been in serious trouble, having to go out and hire a generator (or buy one) and get it connected to the house ring mains.

Perhaps taking 28 days to remedy a faulty part of the system was excessive. But I believe inverters [are renowned for failing](#).

So by all means install solar panels and batteries but make sure they are cost effective. That is producing cheaper electricity over their lifetime than you can get from the grid. These solar systems need constant maintenance, particularly the solar panels that need regular cleaning to maintain energy output levels.

But I strongly recommend against disconnecting from the grid entirely. You might save some supply charges (about 16% of the total bill on average) but you could be at the mercy of a flaky inverter.

Written by Martin Nicholson and first published in On-Line Opinion 12 November 2015