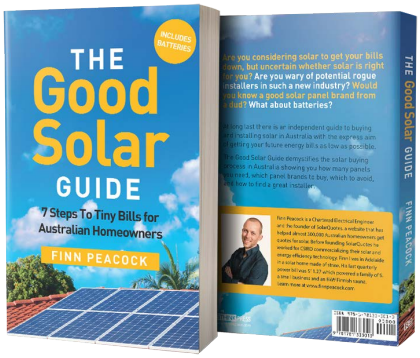
This is an excerpt from my book:

The Good Solar Guide

www.GoodSolarGuide.com



A monitoring system for your solar

The final piece of hardware I urge you to think about is a monitoring system.

A monitoring system will measure your:

- energy consumption
- solar production
- grid exports
- grid imports, and
- battery charge and discharge power

In general, the monitoring system will send this data to the internet every few seconds. You'll be given a login where you can see various graphs and numbers that tell you what's going on.

For an engineer like me, poring over graphs and numbers is heaven. But I totally get that, for most normal people, it sounds as much fun as doing your taxes. So why am I recommending that you invest in a monitoring system?

Reason 1: Timely alerts when your solar system trips off

Even if you never look at your dashboard, a good monitoring system will alert you as soon as anything goes wrong with your solar system.

A typical Aussie home will save at least $500 per quarter with solar, often much more. Most homes get their energy bills every three months. If your solar inverter has an error and shuts down, you're not likely to notice for up to three months, when you open your bill and fall off your chair. You see, a solar system just sits there and works. If it stops working, the grid simply steps in and provides the power instead of your panels. You'll never know until the bill arrives.

From the emails I get, I can tell you this happens all the time. Imagine getting used to $50 bills and then getting hit with a bill for $550 or even $1,050. It makes you feel sick to the stomach when it happens.

With a good solar monitoring system, you'll get an email or SMS within a couple of days of the system going offline. Then you can call your installer and get the system back online ASAP.

Reason 2: Timely alerts if your panels' performance drops

Solar panels come with a minimum performance guarantee of 25 years, but how do you know if their performance ever drops below that guaranteed minimum? A good monitoring system can check that for you. It will know the correct performance associated with the direction and angle of your roof and even the local weather, and it will alert you to poor performance. This is much more sophisticated than telling you if the system has tripped off; the good

systems can advise to within a few per cent whether your system is performing as it should be.

You're paying thousands of dollars for those panels to be installed, so it makes sense to be alerted if you stop getting the performance you paid for.

Reason 3: Timely alerts if your inverter's performance drops

We learned that the efficiency of your solar inverter is directly proportional to your power output. If its performance drops then your savings fall too. A good monitoring system will alert you as soon as there is a problem with your inverter so you can get it repaired or replaced.

Some inverters come with built-in solar monitoring. I recommend a third-party monitor to keep the inverter manufacturers honest. Using the inverter manufacturer's monitoring to advise you if you should make a claim on their warranty is putting the fox in charge of the hen house.

Reason 4: Safety

As our homes turn into distributed power stations, the consequences of electrical faults can be more severe. As a former electrical engineer, I can tell you that big power stations have all sorts of monitoring systems to alert the operators to faults that may be early indicators of dangerous or costly equipment failure. I believe that your home should have similar protection.

A good monitoring system can detect all sorts of fault conditions using funky algorithms. These conditions can be warnings that something is close to failure. For example, a detected fault in a

solar panel may be a precursor to panel breakdown which, if left, could lead to the high DC voltage arcing and causing a roof fire.

A good monitoring system makes your solar safer.

Reason 5: Understanding exactly why your bill has gone up or down

I get emails all the time from solar owners whose latest bill is unexpectedly high. The first thing we check is that the solar system is working. Often, it is. The only rational explanation for the high bill could then be:

- the performance of the solar reducing
- consuming more energy
- changed tariffs, or
- a billing error

Working out the cause requires maths, accounting ability, engineering skills and lots of time. Most people give up in frustration.

A good solar monitoring system can give you the reason in two minutes, so you can take the right action to get your bills back down.

Reason 6: Optimising your retail offer

Your area probably has at least a couple of dozen electricity retail tariffs to choose from. With the various discounts and add-on charges, the tariffs are confusing and difficult to compare. A good solar monitoring system can continuously track your usage, compare it with current offers and alert you when a retailer offers a new tariff that will save you money. Take that, electricity retailers! This alone should pay for your monitoring system many times over.

Reason 7: Energy efficiency

If you're interested in improving your home's energy efficiency, the insights a monitoring system can give you will really help. Here's an example: your 'always on' power is the minimum power your house draws from the grid – probably in the middle of the night. It is the level of power consumption that you never drop below. This number reveals how big your 'standby loads' are, so you can identify appliances that suck power even when you're not using them.

Monitoring can also help you discover which appliances you could start using in the daytime so they use solar instead of grid power – increasing your self-consumption ratio.

Which monitor should I buy?

As mentioned already, many inverters come with monitoring. Almost all of them will let you monitor their solar production remotely these days, and some include consumption monitoring. I'll let you in on a little secret: most of them suck compared to a good third-party monitoring system. Why? Because they're made by inverter manufacturers, and the software is a side gig.

Some of the inverter manufacturers that have reasonable monitoring software include Fronius, SMA and Enphase. Even so, from what I've seen, none of them can alert you to a failure much more subtle than total system shut-down, except Enphase, whose system should tell you if a single micro-inverter fails.

A solar monitor from a solar monitoring company, which does nothing but think about how to make their monitoring software

better every day, is the best way to keep tabs on your super-duper solar (and perhaps battery) system. A third-party system is the only way to get all the features I described above.

The only third-party system I recommend at time of writing is an Australian system called Solar Analytics. It does everything mentioned above except 'Reason 6: Optimising your retail offer', but they assure me that feature is being worked on.

The downside of this package is that, to unlock its full potential, you have to pay $6 a month. The upside is that, if you get it installed with your solar system, you should only be looking at about $300 for the hardware.

If you can wear the monthly fee, I highly recommend adding Solar Analytics to any solar system you buy. To put the $6 a month in perspective, if it alerts you to a warranty issue on your inverter or panel array before the warranty expires, it could pay for itself for twenty years.

I think of a monitoring system as cheap insurance on a critical service, and consider it an essential addition for any savvy solar buyer.

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