

SOLAR POWER

Your Questions Answered

HOW DO THEY WORK?

1. What is the difference between solar panels (power) and solar hot water?

Solar panels take light from the sun and make electricity. Solar hot water systems take heat from the sun and heat water. It's easy to remember:

- Heat from the sun heats the water.
- Light from the sun turns on the lights.

2. How do solar power systems work?

Solar power systems convert the energy from sunlight into direct current (d.c.) electricity. An inverter then converts this direct current to alternating current (a.c.), to make it compatible with grid electricity. Solar power systems should be oriented to the North and tilted in order to generate as much electricity from the sun as possible.

3. Why use solar power?

- It is quiet, clean and reduces electricity bills.
- It avoids the impacts of fossil fuel power stations such as greenhouse gas emissions and local air pollution.
- It avoids the need for ugly and expensive powerlines to carry electricity from large power stations to your home.
- It can add value to your house, and make an interesting and unique architectural feature.

4. If I have solar panels, does that mean I won't have electricity when it's dark, cloudy or raining?

Solar panels do need light to produce electricity. However, the electricity can be stored in batteries or in the electricity cables on the street (for grid-connected systems). Therefore, there'll always be extra electricity if you need it.

5. Will my solar panels make power during blackouts/power surges?

If you have a grid-connected system your power will go out in a blackout, as your system's inverter automatically disconnects the electricity supply to prevent electrocution. When this happens, you can't get your electricity back out of the cables, and you can't put any more in. In regional areas where the supply of electricity is not reliable, 'non-interruptible' solar power systems can be set up to provide power when blackouts or power surges occur. Such systems incorporate a battery bank to store the back up power.

6. Do my solar panels work better in daylight savings?

Daylight savings is the time of year when we get the most sunlight hours, because of the season – a panel in NSW won't do better than one in QLD during daylight savings time!

7. Are solar power systems reliable?

Some early solar power systems were unreliable, just like early models of mobile phones, computers, radios, TVs, microwaves etc. Today solar power systems are covered by Australian standards and installed by trained professionals. Typical warranties are 20 years for panels and 5 years for electrical components – better than most household appliances.

8. Are the batteries reliable and how long will they last?

Yes. Batteries are generally very reliable and will last 5-7 years provided you look after them properly (in the same way as your car battery e.g. regularly check charge levels, top up with distilled water etc.). Ask your installer for care advice.

9. How reflective are solar panels?

Solar panels are designed to absorb as much light as possible to generate the maximum amount of electricity. Therefore the materials typically have no or low reflectivity.

INSTALLING A SYSTEM

10. How many solar panels do I need to run my house?

This depends on how much power you use. The average Australian home consumes about 7,400 kWh of electricity each year and this would need about 64 panels (which would take up a lot of roof space). However, most Australians can dramatically cut their energy use by being Energy Smart and would require a much smaller more affordable system.

Also, you don't need to install enough panels to power the whole house if you live on grid electricity. You could, for instance, buy as many panels as you can afford (and add on later), and buy Green Power for the rest.

A typical rooftop solar power system (1.2 kW) has an area of about 7.6 square metres (approximately 12 x 80 watt panels) and generates around 1,600 kilowatt-hours of electricity each year. This is enough to power:

- 5 compact fluorescent light bulbs
- A 4-star 250L refrigerator, a 4-star top loading washing machine
- A stereo
- A medium sized television

Remember, you'll always have your battery storage or the electricity grid there if you need extra electricity.

11. Do I need permission from the electricity supplier before I install solar panels?

Yes. Electricity suppliers are not obliged to connect your system to the grid. Before you purchase a grid-connected solar power system, make sure you check with your local electricity supplier about connection and metering arrangements.

12. Do I need a Development Application (DA) to install solar panels? What about heritage-listed areas?

It depends on the council's regulations, so it is best to check with your local council.

13. Do I need home building insurance to install?

No, but Home and Contents insurance is a good idea if you have solar panels. As with all major household purchases, make sure that your solar power system is included.

14. What if my roof doesn't face north?

North-facing roofs are ideal for solar power, but most systems can work up to an angle of 45 degrees off North. Ask your local solar supplier or installer for advice.

15. How long will the panels last?

Generally, systems last 20-30 years since the waterproof seals on the panels tend to deteriorate over time.

16. If I move home, can I take the solar panels with me?

You could take your solar power system down and re-install it at your new house provided the roof of the new house is suitable. Or, you could include it in the selling price of your house. If your house is in a remote area and the solar power system is the sole source of power, the purchaser of your house would be wise to make sure the solar power system is included in the price, or they'll be left without electricity.

17. Are solar panels made in Australia?

The silicon used to make the solar panels is imported, and the panels manufactured and assembled in Australia. The US and Japan manufacturing industries are larger than Australia, but we use more solar power on a per capita basis.

COST

18. Is solar power more expensive than conventional electricity?

At the moment it is. The current market for solar power in NSW is small and therefore the price compared to coal-fired electricity is high.

19. How much does it cost?

A solar power system can cost anywhere between \$6,000 and \$60,000. The cost depends on the technology you choose, the size, your roof, and what extras you get. A 1 kW grid-connected system typically costs around \$20,000. You may also need to reprogram your meter (\$100-200) or install a new one (around \$500). It makes sense to make your home more energy efficient so you will need fewer solar panels. If connected to the grid, you only need to buy what you can afford.

There is also a government rebate available to make solar power more affordable (note that it is necessary to apply for the rebate before purchasing and installing equipment. Speak to your installer for further information).

20. Do solar power systems ever pay themselves back?

A solar power system is a big investment and as long as electricity prices stay the same, the payback in terms of what you save on energy bills will be very long. If prices go up, it will be shorter (but still a long time). However, keep in mind that solar panels are a similar price to many other home renovations or consumer goods which will never pay themselves back e.g. home theatre, new carpet, swimming pool or a new kitchen.

21. Is it more expensive to fit an old house than buying a system for a new house?

The cost would be about the same if the roofs were the same shape. If you are building a new house you can make sure the roof is optimally shaped and oriented for solar power. If you are building a new house, the relative cost of the solar panels compared to the overall cost of the house will be small.

22. If I make more energy than I use, do I get money from my electricity retailer?

It depends on each electricity retailer. Some may offer a credit for energy excess energy you produce. Ask your energy retailer what's available.

MAINTENANCE AND SAFETY

23. Will solar panels damage my roof structure?

Your roof has been designed to carry a lot of weight and most roofs will hold panels without need for reinforcement. Solar panels can be heavy and are attached to the rafters of the house so that the load is ultimately borne by the roof structure not the roof material (e.g. tiles). A solar installer will design your solar power system to take account of the roof structure. Solar panels are placed over the top of any roof penetrations, and all penetrations can be waterproofed so the roof won't leak.

24. Are they easily maintained?

Yes. Solar panels are designed so that they need little maintenance. Dust typically reduces output by 5% but since solar panels are sloped, the rain keeps them clean. You'll just need to hose them down after long periods of little rain.

25. Will my solar panels survive a hailstorm?

Yes. Solar panels are made of tough laminated glass and are generally indestructible. They are also sloped so hail slides off.

SOLAR POWER TECHNOLOGY

26. Do solar panels produce enough energy to recoup the energy it took to make them?

Yes. Modern solar panels will make approximately enough electricity in 4 years to cover the amount of energy that was used in manufacture. Solar panels generally have a 20-year lifespan.

27. What is the environmental cost of making solar panels?

Making solar cells from silicon does use some toxic chemicals. However these are all contained and re-used, unlike the air pollution created by burning coal. Disposal can also be controlled.

28. How efficient are solar panels in comparison to other renewable energy technologies?

In terms of converting a renewable resource to energy, solar panels are less efficient (15%) than other renewable energy technologies such as wind farms (30%) or hydro generators (40%). Solar panels require the least maintenance since there are no 'moving parts' as in other technologies.

29. How many greenhouse gases would be saved with solar panels?

A typical 1 kW solar power system would roughly save 1.4 tonnes of greenhouse gases each year (a tonne of CO₂ is enough to fill a family home!).

30. Can you recycle old solar panels?

Since the silicon is treated with various chemicals ('doping') to make the surface more receptive to light, it is difficult to manufacture into new products. That doesn't mean to say you can't fashion a great coffee table from an old solar panel!

MORE INFORMATION

How do I find out more?

For general information and to locate your nearest solar supplier:

Call: Energy Smart Information Centre – **1300 138 122**

Visit: www.seda.nsw.gov.au (Solar Power pages)

www.greenpower.com.au (Green Power website)

Look: Yellow Pages under "Solar Equipment"



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