



Solar panels are an environmentally-friendly source of 'free' power

# Panel games

Solar panels don't produce vast amounts of power, but they are ideal for topping up the battery. **John Wickersham** sheds some light on the subject

**I**N THE spring of 2007, I eventually decided to mount a 70W photovoltaic (solar) panel on the roof of a motor caravan. Five summers later, I can report on its achievements.

It is worth noting that it is light – and not heat – that produces power. In fact, too much heat can reduce the output of a PV panel. A solar panel operating in a cold, clear, bright Antarctic

location is likely to produce more electricity than an identical panel installed in a sunny, hot – yet hazy – Mediterranean resort.

Be aware, too, that a panel's 24-hour output is much lower during winter when there is less daylight available – a shame because we have greater need for lighting, heating and entertainment systems during dark evenings.

## TECHNICAL POINTS

- Solar panels fitted on leisure vehicles do not produce 230V mains power. What's more, their 12V DC output can seldom be used to operate an appliance directly because fluctuations in light levels cause an ever-changing supply of power.
- The output from a solar panel is normally used to keep a leisure battery >>

## A fixed solar system



This is one of the more common, rigid types of solar panel, which has an aluminium frame and a toughened-glass protective covering.



Some retailers supply fixing brackets to secure a panel to a roof. However, owners should investigate whether their roof can support the weight and check that an installation won't invalidate their caravan's warranty.



The cables taking power to a battery must be of sufficient gauge to prevent a significant voltage drop. Many panels include pre-coupled cables.



To prevent battery over-charging, a regulator is usually needed. Some are inexpensive but many owners want one with a screen that indicates charge levels, an Ah summary and so on.

## Buying and care tips



To avoid roof alterations, many caravanners buy portable, free-standing products. Small panels usually give a modest output, whereas larger 'open book' products like this can be rated at 60W.



If you opt for a portable product, it's a good idea to buy a sturdy security cable and padlock to deter the grab-and-run thief.



Roof panels can get damaged by low branches. The installer of this product has mounted it below the top of his motor caravan roof rack.

topped up – however, it takes many hours of light to produce sufficient electricity to revive a badly discharged battery.

- Since modern caravans run numerous 12V accessories, it's often recommended that customers install at least a 70W panel. Dividing the

Watt rating by 14.3 gives a rough idea of the maximum Amps that a panel can produce – when there's exceptionally good light.

- Incidentally, the term 'Volts' is a measure of electrical 'pressure'; Amps (referred to as the 'current') relate to the amount of electricity being

produced or consumed. (Multiplying Amps by Volts gives Watts).

- In bright conditions, solar panels often produce between 18V and 20V – enough to damage a 12V leisure battery – so a charge regulation device is usually needed, too.
- With good light, dividing a 70W panel's output by 14.3 gives about 4.9A. That's not a lot of current – just one halogen light consumes around 1.5A...
- ... This explains why it would take ages for a solar panel to revive a fully-discharged 90 Amp Hour leisure battery.
- Expect to pay £450-£500 to have a 70W panel and charge regulator installed.
- More power is produced by panels that are repeatedly adjusted to face directly into the sun. However, models which include monitoring and adjustment mechanisms are usually expensive.
- Some caravan roofs are not strong enough to support a solar panel. A glass-protected 135W panel weighs around 13kg.

## Installation



In these illustrations, a semi-flexible GB Sol 70W product is being fitted. It weighs just 3kg and only one hole is needed for the cable.



Both the plasticised protective surface and an aluminium backing permit a small amount of flexibility – provided it doesn't exceed 40mm in a metre. This example fits snugly on a curving roof.



The roof is cleaned and the position of the panel marked with tape before caravan adhesive sealant is applied. This is placed around the perimeter and across the centre of the panel.



Weights are used to hold the panel down while the adhesive cures. Further sealant is later added around the perimeter to seal the junction between the roof and the panel. The cable entry point is also sealed.

**I'm pleased I fitted this panel – in ideal conditions it produces just over 3A. Additional 2.5mm automotive cable links a Steca controller to the leisure battery. The panel successfully compensates for current used by a clock, a gas alarm and a security device – except during the short December/January days. That's when a mains hook-up is also used to keep the battery fully topped-up.**

## CONTACTS

- **Allsolar** – solar system retailer. Call 01569 764037 or see [allsolar.co.uk](http://allsolar.co.uk)
- **Detroit Solar** – solar system retailer. Call 01773 860030 or see [detroitssolar.com](http://detroitssolar.com)
- **GB-Sol** – manufacturer of lightweight, semi-flexible panels. Call 029 2082 0910 or see [gb-sol.co.uk](http://gb-sol.co.uk)
- **PB Auto Electrics** – supplier and fitter of solar products. Call 01623 659311 or see [pbautoelectrics.co.uk](http://pbautoelectrics.co.uk).
- **RoadPro** – supplier of solar systems and products. Call 01327 312233 or see [roadpro.co.uk](http://roadpro.co.uk)