

Solar power

by Richard Sidaway

Which form of energy is free during the day, produces no dangerous waste products and will be available for the next 4 billion years? Solar power, of course.

Here are just some of the things you can do with it, with a bit of simple technology

Cooking – get a metal box and put some mirrors and a pot inside. Hey presto, you've got an oven! The mirrors focus the sunlight onto the pot to cook the food. The temperature can go to at least 200°C. Somebody first invented a solar oven in Europe a few centuries ago. They are very useful these days in places where there is lots of sunlight, like Africa. The alternative is to cut down more and more trees to make fires.

Heating water– this is the most common use of solar energy at the moment. It works like this. A system of tubes heats up in contact with sunlight. The tubes go into a tank with water in it. A few hours sunshine will give most houses enough hot water for a whole day. Swimming pools can be heated this way, too.

Lighting- many shops now sell small lights which collect the sun's energy during the day using a small solar panel. At night they can illuminate your garden. The lights on a mobile phone work on a similar principle. Recently, a university student used this idea in a common women's accessory- she invented the solar-powered handbag. When you open it, a light comes on. Now it is much easier to look for your door key when you get home at night.

Operating small devices – if you put a small photovoltaic cell on top of a parking meter, an emergency telephone or a calculator, there is no need to be near an electricity supply. Photovoltaic cells are also used to operate satellites in space. There is a problem- they are expensive because they are made from silicon.

Keeping things cool – solar-powered refrigerators are now available on the market. They are useful in places where there is no conventional electricity supply. In the mountains of Kashmir, the survivors of a recent earthquake got safe supplies of blood, vaccines and other drugs because of these refrigerators.

Driving – every two years, teams of car designers try to cross Australia. They drive from north to south, coast to coast, in the best time possible and they can only use the sun to power their vehicles. The winners usually do the 3,000 km in under a week, going at about 100km/h. Major multinational companies, including car makers, sponsor the event. They are hoping a solar car will become a reality one day. Then nobody needs to be dependent on oil.

Recharging your batteries – if you've got a laptop computer, a mobile phone or a portable music player and you can't find an electric socket, don't worry. There are now solar panels that fold up and go in a small bag so that you can carry them around with you. They only weigh 250 grams.

Making buildings self-sufficient – large solar panels are becoming common on the sides or tops of buildings to provide electricity for the people working inside. In Britain, there's an office block in Manchester which is covered in them. In Greece, twenty per cent of houses have them.

Providing electricity to the masses– in the middle of Australia they have nearly finished the construction of a huge chimney. It will make enormous amounts of electricity. It's called a solar tower, it's about 1,000m tall, and it works by sucking hot air upwards. The air has enough force to drive 32 large turbines. This will create power for about 200,000 homes.

Building your house the right way round – the easiest way of using the sun's energy is to make your house face south. Then you make sure that the rooms on that side are the ones where you spend the most time, like the kitchen or living room. It also helps to put lots of windows on this side of the building. In the winter they will catch the maximum amount of sunlight.