

## Party time!

Mar 5th 2009

From The Economist print edition

### **Energy: It may sound silly, but metallised balloons could provide an unusually cheap and effective way to generate solar electricity**

SOLAR cells are expensive, so it makes sense to use them efficiently. One way to do so is to concentrate sunlight onto them. That means a smaller area of cell can be used to convert a given amount of light into electricity. This, though, imposes another cost—that of the mirrors needed to do the concentrating. Traditionally these are large pieces of polished metal, steered by electric motors to keep the sun's rays focused on the cell. But now Cool Earth Solar of Livermore, California, has come up with what it hopes will be a better, cheaper alternative: balloons.

Anyone who has children will be familiar with aluminised party balloons. Such balloons are made from metal-coated plastic. Cool Earth's insight was that if you coat only one half of a balloon, leaving the other transparent, the inner surface of the coated half will act as a concave mirror. Put a solar cell at the focus of that mirror and you have an inexpensive solar-energy collector.

Cool Earth's balloons are rather larger than traditional party balloons, having a diameter of about 2½ metres (eight feet), but otherwise they look quite similar. The solar cell aside, they are ridiculously cheap: the kilogram of plastic from which each balloon is made costs about \$2. The cell, the cost of which is a more closely guarded secret, is 15-20cm across and is water-cooled. That is necessary because the balloon concentrates sunlight up to 400 times, and without this cooling the cell would quickly burn out.

Like a conventional mirror, a solar balloon of this sort must be turned to face the sun as it moves through the sky, and Cool Earth is testing various ways of doing this. The focus of the light on the solar cell can also be fine-tuned by changing the air pressure within the balloon, and thus the curvature of the mirror.

The result, according to Rob Lamkin, Cool Earth's boss, is a device that costs \$1 per watt of generating capacity to install. That is about the same as a large coal-fired power station. Of course, balloons do not last as long as conventional power stations (each is estimated to have a working life of about a year). But the fuel

Illustration by Pelle Mellor



(sunlight) is free. When all the sums are done, Mr Lamkin reckons his company will be able to sell electricity to California's grid for 11 cents a kilowatt-hour, the state's target price for renewable energy, while still turning a tidy profit.

That belief will soon be put to the test. Cool Earth plans to open a 1-megawatt facility this summer. If it works, more will follow and—in the deserts of California and elsewhere—it will be party time for solar-energy enthusiasts.