

Sticking solar power station where the Sun shines

By **Kenneth Macdonald** BBC Scotland Special Correspondent (15 May 2012 Last updated at 23:07 GMT)

There's always the Sun. It burns four-million-tons of fuel every second and gives the energy away for free.

But while solar power is already generating many megawatts worldwide, the weather and the night tend to spoil things somewhat.

Researchers in Scotland are seeking to overcome that.

Aerospace engineers at Strathclyde University are working with colleagues in Europe, Japan and the US to stick solar power stations where the Sun shines all the time - in orbit.

A solar satellite would operate far beyond our weather. Microwaves or lasers would then beam the power down to Earth.

The man leading the research, Dr Massimiliano Vasile, says one potential application is in disaster areas, where emergency power is needed urgently.

He says mobile military units would also benefit. Relatively small laser receivers would make them independent of fuel supply lines.

Gravity well

The frequencies of the beams would be tweaked to avoid the dangers associated with microwaves and lasers.

Passing flocks of geese would not be cooked to a crisp. The wings would not be sliced off passing jumbo jets. The same principles would be used to enable the beams to pass through clouds.

There are potential applications beyond Earth. The technology could send power to rovers exploring the dark side of the Moon - or to other satellites.

Dr Massimiliano Vasile is leading the research team at Strathclyde University

Here on the Earth's surface we live at the bottom of a gravity well. Putting even lightweight metal structures into orbit is costly and complex. That is why at Strathclyde they're experimenting with even lighter materials?

Postgraduate student Thomas Sinn is working with disks of thin metallic plastic film. They're small and flimsy even when two of the discs are welded together at the edges.

But in the vacuum of space the tiny amount of air trapped between them would inflate to create a semi-rigid structure. Several of the inflatables could be joined into arrays to trap sunlight or reflect solar power to earth.

Soft landing

It's a theory which is due to be tested in space next year. But other ideas have already left the lab.

Earlier this year the team launched another experiment to the edge of space.

It was designed to test an idea from Japan: a lightweight, spinning net which could form the foundation for a solar satellite.

Its four cameras sent back just over two minutes of intriguing images. The final two frames show tantalising hints that the space net did deploy.

But then the parachute didn't open. One of our space shots is missing.

The experiment fell into deep snow in the far north of Sweden - and the possibility of a soft landing has the Strathclyde team hoping even more data can be recovered.

That's why Thomas Sinn and colleagues will be setting off in August on a recovery mission. And as funding for that sort of thing is tight they're attempting to crowdsource it on the Web.

The whole idea of solar satellites and energy beams may seem farfetched to the rest of us. But to its proponents this is not pie - or indeed a power station - in the sky. It's serious science which bodies like the European Space Agency and NASA are working on alongside the Scottish-based engineers.

Indeed the science may prove to be the easier part. Making the leap into orbit will require money and, even more than that, political will.