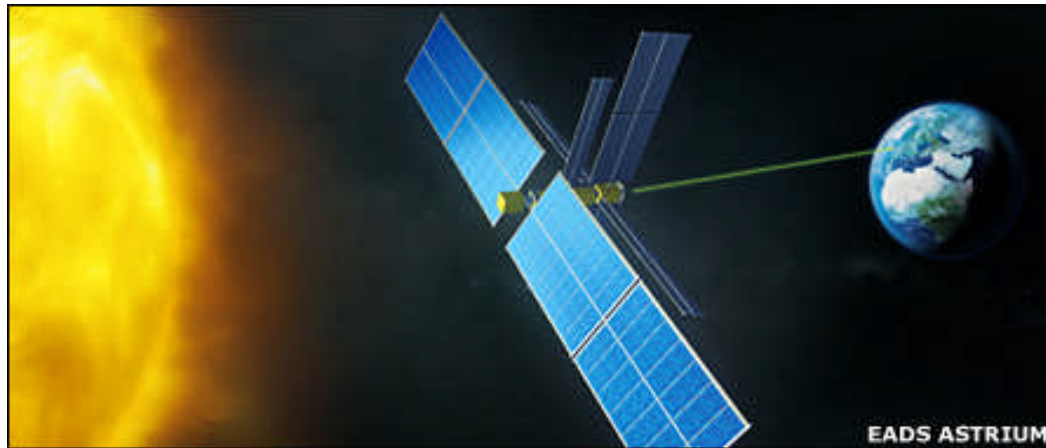


EADS Astrium develops space power concept

By Jonathan Amos
Science reporter, BBC News



Europe's biggest space company is seeking partners to fly a demonstration solar power mission in orbit.

EADS Astrium says the satellite system would collect the Sun's energy and transmit it to Earth via an infrared laser, to provide electricity.

Space solar power has been talked about for more than 30 years. However, there have always been question marks over its cost, efficiency and safety.

But Astrium believes the technology is close to proving its maturity.

"Today we are not at an operational stage; it's just a test," said chief executive officer Francois Auque. "In order to implement a solution, of course, we would need to find partnerships and to invest, to develop operational systems," he told BBC News.

Those partnerships could comprise space agencies, the EU or national governments and even power companies, he said.

'Safe' system

Space solar power is an attractive concept because it would be clean, inexhaustible, and available 24 hours a day.

The amount of energy falling on photovoltaic cells placed in orbit is considerably greater than the same solar panels positioned on the Earth's surface. In space, the incidence of light is unaffected by clouds, dust or the filtering effects of atmospheric gases.

Critics, though, have always pointed to multiple hurdles - to the cost of launching and assembling large solar stations in orbit, to the losses in efficiency in conversion, and to the safety issues surrounding some wireless transmission methods, particularly those that use microwaves.

Astrium says the latter can be addressed by using infrared lasers which, if misdirected, would not risk "cooking" anyone in their path. The company has already tested power transmission via laser in its labs, and is now working on improving the efficiencies of the end-to-end system.

Necessary efficiency

Robert Laine, Astrium's chief technology officer, acknowledges however that there are still some big challenges to be overcome.

"Today, we will be limited in power by the size of the laser we can build. That's a prime limitation," he said.

"On the receive side, the conversion of this infrared energy into electricity - that's something which is progressing very fast and we are working with the University of Surrey [in the UK] to develop converters.

"The principle is to get a very high efficiency of conversion of the infrared [laser light] into electricity. If we achieve 80% then it's a real winner."

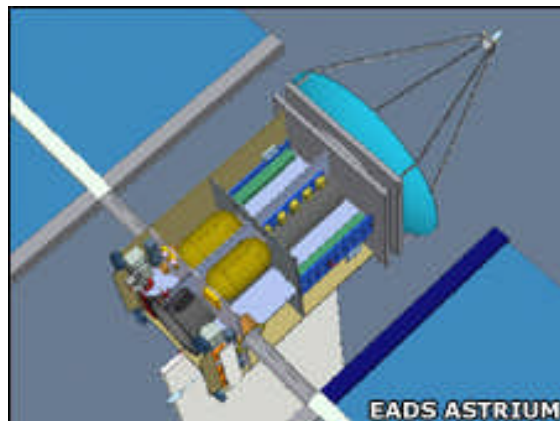
Dr Laine said a small demonstration of the technology ought to be ready for launch in the coming decade.

"Like any technology, someone has to demonstrate it first before it can become an operational system," he told BBC News.

"We have reached a point where, in the next five years, we could build something which is in the order of 10-20 kW to transmit useful energy to the ground."



Power transmission by laser is being studied in the lab



The concept would need to be proven with a demonstration mission