Miliband plots solar farms in space in quest to hit net zero

Study suggests using orbiting satellites to capture sun's energy under clean power plans

Ed Miliband, the Energy Secretary, is striving to achieve net zero by 2050 Credit: Thomas Krych/Anadolu via Getty Images

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Solar farms could be deployed in space to help Britain hit net zero targets, according to a new report published by the Energy Department.

Under ambitious clean power plans, orbiting solar satellites could be used to capture the sun's energy before beaming it down to an antenna on Earth to be converted into electricity.

The proposal has been cited in a new government study on the latest space technologies which suggests that solar panels could be installed on satellites on Earth before being launched into space.

It is perhaps the most radical proposal yet as Ed Miliband, the Energy Secretary, strives to achieve net zero by 2050.

“Space-based solar power could provide Great Britain with constant, predictable, zero-carbon power at the GW [gigawatt] scale that displaces both intermittent renewables and fossil fuel generation,” the report said.

“A space-based power system involves one or multiple satellites equipped with lightweight solar panels capturing the sun’s energy in space.

“The satellite generates electricity, converts it into microwave radiation and beams it to a ground-based rectifying antenna (rectenna). The rectenna converts the microwave energy into electricity.”

Such ideas have been around for decades – but mainly in science fiction.

Isaac Asimov is credited with the first mention of the idea in a 1941 short story featuring a space station that collects energy and beams it to Earth.

Other science fiction authors have described similar ideas. Arthur C Clarke’s 1962 book Profiles of the Future discussed wireless transmission of power from space-based solar farms.

In recent years, several major space agencies and private firms have moved beyond theoretical papers into hardware testing and orbital demonstrations. These include the UK Space Agency and UK start-ups such as Space Solar.

The report was commissioned in 2021 by Kwasi Kwarteng, then the Conservative business secretary, whose brief included leading on net zero strategies and space technology.

He commissioned the Frazer-Nash consultancy to investigate the idea, with the final report finally published this week by the Department for Energy Security and Net Zero.

It suggests that although initial costs would be high, they would plummet as the technology matured, potentially falling to between £87 per megawatt hour (MWh) and £129 per MWh by 2040.

This compares with a predicted cost of £150 per MWh for new nuclear. The latest offshore wind contracts saw operators offered about £90 per MWh for fixed turbines and £216 per MWh for floating wind.

This suggests that space-based power station operators could be given contracts for difference, giving them a guaranteed minimum price for the power generated. This is the same subsidy scheme used to support renewables such as wind.

However, the report warns that the UK Government would have to help fund initial development, suggesting that the best approach would be to fund a smaller system that could be scaled up later once investors had gained confidence.

“Without prior de-risking, the scale of the upfront investment required for the first large-scale system may deter investors, making it more difficult to unlock the full benefits of space-based power,” the report said.

Such ideas have gained traction with space agencies and other researchers. The European Space Agency (ESA) is currently in the middle of a multi-year research and development phase called Solaris, with a demonstrative satellite in planning.

China has launched its own project with plans for a GW-scale power station in orbit by 2050.

In the UK, start-up Space Solar has been working with the UK Space Agency to design self-assembling orbiting solar power stations.

“Our work has continued to demonstrate the viability of space-based solar power as a firm, uninterrupted clean power source, ready to be deployed on a commercial scale,” the company said recently.

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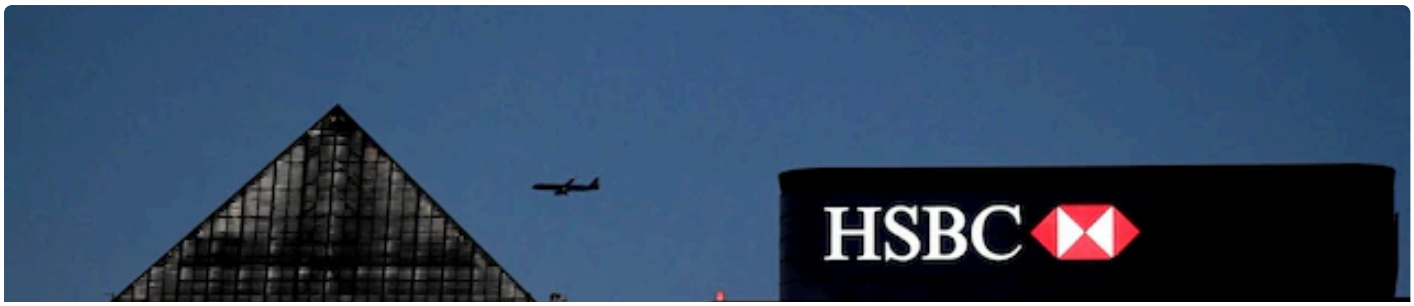

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