
Two-faced Solar Panels Can Generate More Power at Up to 70% Less Cost

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Scientists at the University of Surrey have built a new kind of solar panel with two faces, both of them pretty.

Their flexible perovskite panels have electrodes made of tiny carbon nanotubes. These can generate more power with greater efficiency and at a cost 70% lower than existing solar panels.

Dr Jing Zhang, research fellow at Surrey's Advanced Technology Institute, said: "Our bifacial cells can harvest sunlight from both front and back panels. This generates more energy and depends less on which angle the light hits them.

"The carbon nanotubes we use are very transparent and conduct electricity well. They have the potential to bring clean power within reach for millions of people – and we look forward to seeing how our invention will be used."

Surrey scientists worked with colleagues at the University of Cambridge, the Chinese Academy of Sciences, Xidian University, and Zhengzhou University, [China](#). Together, they built a new kind of two-faced panel (scientists prefer the term 'bifacial'). They used single-walled carbon nanotubes as both front and back electrodes.

These tubes are just 2.2 nanometres across. That is slightly thinner than a strand of human DNA. A piece of paper is thicker than 45,000 nanotubes stacked on top of each other.

The panels could generate over 36 mW per square centimetre – and the back panel produced nearly 97% of the power that the front panel did. That compares to 75-95% for most bifacial

panels currently on the market.

Professor Ravi Silva CBE, the director of the Advanced Technology Institute, said: "The world cannot decarbonise without solar power. Yet that requires much cheaper solar energy than is currently available. Panels that can absorb the sun's energy on both sides are a great way to make the technology more cost-effective.

"We have produced arguably the highest efficiency single junction solar cell to date. Our panels cost 70% less to make than a normal one-sided solar panel. This could significantly modify the market and simplify the architectures required based on perovskite solar cells."

The study is published in the journal [Nature Communications](#).

Read the [original article](#) on University of Surrey.