



# Newest solar technology for homes

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In November 2023, a buzzy solar technology broke yet another world record for efficiency. The previous record had existed for only about five months--and it likely won't be long before it too is obsolete. This astonishing acceleration in efficiency gains comes from a special breed of next--generation solar technology: perovskite tandem solar cells. These cells layer the traditional silicon with materials that share a unique crystal structure.

In the decade that scientists have been toying with perovskite solar technology, it has continued to best its own efficiency records, which measure how much of the sunlight that hits the cell is converted into electricity. Perovskites absorb different wavelengths of light from those absorbed by silicon cells, which account for 95% of the solar market today. When silicon and perovskites work together in tandem solar cells, they can utilize more of the solar spectrum, producing more electricity per cell.

Technical efficiency levels for silicon--based cells top out below 30%, while perovskite-only cells have reached experimental efficiencies of around 26%. But perovskite tandem cells have already exceeded 33% efficiency in the lab. That is the technology's tantalizing promise: if deployed on a significant scale, perovskite tandem cells could produce more electricity than the legacy solar cells at a lower cost.

The electrochemical makeup of perovskites means they're sensitive to sucking up water and degrading in heat, though researchers have been working to create better barriers around panels and shifting to more stable perovskite compounds.

In May, UK-based Oxford PV said it had reached an efficiency of 28.6% for a commercial-size perovskite tandem cell, which is significantly larger than those used to test the materials in the lab, and it plans to deliver its first panels and ramp up manufacturing in 2024. Other companies could unveil products later this decade.

Solar technology has many benefits. Investment can help lower bills -- with the average three-bedroom household saving £467 per year -- as well as reduce our planet's carbon footprint, particularly with the cost of solar panels coming down.

We're moving at a fast pace to generate new forms of solar technology, and it can be hard to keep up. This is where we come in. Below, you'll see a full rundown of all the latest pieces of technology and how they'll help us.

The solar industry is always evolving, especially as the cost of solar panels continues to decline. Governments are increasingly developing and adopting solar power in a bid to become greener and meet their own net zero targets.



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Solar purification, as reported by Pure Water Tech, “combines the sun’s UV rays and the heat the sun produces. These elements heat the water almost to a boiling point and change the makeup of the water, heating pathogens and contaminants in the process.”

Many solar water purifiers are already operational around the world. For example, a solar-powered desalination system was developed by MIT (Massachusetts Institute of Technology) and in China can provide around seven litres of drinkable water per hour, for each square metre of the solar network.

The recommended guidance for water consumption is between 2.7 and 3.7 litres per day, including the water in food, which makes up 20% of our fluid intake. That means for the average person, 2.6-2.7 litres would be adequate, meaning a 100m<sup>2</sup> version of MIT’s solar network would supply enough clean drinking water for 2,213 people, every day.

This technology has already been implemented in Kiunga, Kenya by a non-profit called GivePower. The system can provide 75,000 litres per day – enough to quench the thirst of more than 28,800 people.

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