

Solar cells with high power generation efficiency

What is the world's most efficient solar cell?

Credit: Nature (2025). DOI: 10.1038/s41586-025-09681-w Earlier in 2025, Chinese solar manufacturer Longi announced it had built the world's most efficient solar cell. The hybrid interdigitated back-contact (HIBC) cell achieved 27.81% efficiency, which was verified by Germany's Institute for Solar Energy Research Hamelin (ISFH).

How efficient are silicon solar cells in the photovoltaic sector?

The photovoltaic sector is now led by silicon solar cells because of their well-established technology and relatively high efficiency. Currently, industrially made silicon solar modules have an efficiency between 16% and 22% (Anon (2023b)).

How efficient are solar cells?

Solar cells of this kind, characterized by reduced material usage, lower manufacturing costs, and flexibility, typically achieve conversion efficiencies ranging from 6% to 15% (Jaiswal et al., 2022).

How efficient are Si-based solar cells compared to multi-junction solar cells?

Additionally, it evaluates efficiency improvement techniques such as light management and spectral utilization. While the efficiency of Si-based solar cells has plateaued around 25%, the efficiency of III-V compound semiconductor-based multi-junction solar cells is increasing.

Best Research-Cell Efficiency Chart NLR maintains a chart of the highest confirmed conversion efficiencies for research cells for a range of photovoltaic technologies, plotted from 1976 ...

Engineers improved antimony chalcogenide solar cells by stabilizing sulfur and selenium during growth, lifting certified efficiency to a record 10.7%.

Consolidated tables showing an extensive listing of the highest independently confirmed efficiencies for solar cells and modules are presented. Guidelines for inclusion of results into these tables a...

Engineers target 40% efficiency in next-generation solar cells for clean energy PolyU team outlines strategy to boost solar efficiency and align next-gen renewable tech with China's ...

The solar technologies emerging in 2026 are more efficient and accessible than ever. Beyond immediate gains in energy production, these innovations set the stage for solar to potentially ...

A study reports a combination of processing, optimization and low-damage deposition methods for the production of silicon heterojunction solar cells exhibiting ...

China has quietly pulled off a feat that solar engineers have chased for years, pushing a new cell design to record efficiency by hiding its most important features beneath the surface. ...

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Best Research-Cell Efficiency Chart NREL maintains a chart of the highest confirmed conversion efficiencies for research cells for a ...

The sensible engineering of effective solar devices made of cutting -edge materials along with nanostructured ternary metal sulphides, and three-dimensional graphene are also briefly ...

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