

## Solar panel efficiency tables 2023

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January 2023. Abstract 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 the...

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The international research group led by Professor Martin Green from the University of New South Wales in Australia has published Version 63 of the "solar cell efficiency tables" in Progress in Photovoltaics.

One of the six results added to the tables is the 25.2% efficiency that researchers at Northwestern University in the United States achieved for a 1-cm<sup>2</sup> lead halide perovskite cell.

Furthermore, the tables now include the 22.4% efficiency that US-based First Solar achieved for a 0.45 cm<sup>2</sup> cadmium-telluride (CdTe) cell, the 26.1% efficiency that China's University of Science and Technology of China (USTC) obtained for 0.05 cm<sup>2</sup> Pb-halide perovskite solar cell, and the 26.1% efficiency the Northwestern University and the University of Toronto in Canada achieved for a 0.05-cm<sup>2</sup> Pb-halide perovskite solar cell.

The fifth result added to the tables is the 36.1% efficiency that Germany's Fraunhofer Institute for Solar Energy Systems (Fraunhofer ISE) and Dutch research institute AMOLF achieved in September for a multijunction solar cell based on silicon and III-V semiconductors such as gallium indium phosphide (GaInP) and gallium arsenide (GaAs).

In Version 62 of the tables, released in June the researchers added 21 new results, a record number for the Tables. The group has seen major improvements in all cell categories since 1993, when the tables were first published.

The research group includes scientists from the European Commission Joint Research Centre, Germany's Fraunhofer Institute for Solar Energy Systems and the Institute for Solar Energy Research (ISFH), Japan's National Institute of Advanced Industrial Science and Technology, the US Department of Energy, and the US National Renewable Energy Laboratory.

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