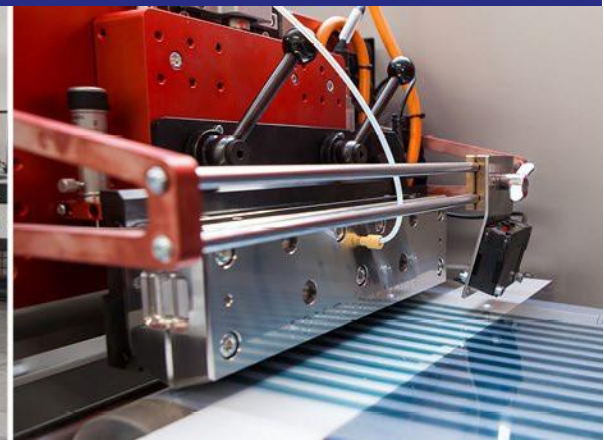


# US-MAP Statement on Perovskite PV Ecosystem Needs



If properly targeted and resourced, bold and sustained U.S. investment in perovskite photovoltaics could produce tens of thousands of U.S. manufacturing jobs using domestically materials. These investments will be key to securing long-term economic resilience and achieving energy security goals.

The world and the United States are heading toward a future where the majority of energy generation will be from photovoltaic (PV) solar panels. In 2022, the world surpassed a terawatt of global installed PV capacity, and deployment will continue to grow exponentially over the next decade. To be competitive in this growing market, the United States needs to invest in bridging manufacturing and science to address gaps in the current research landscape for maturing technologies and create a healthy, competitive thin-film PV technology ecosystem in the United States.

Metal halide perovskite semiconductors and associated thin-film PV, often known simply as perovskite PV, is a rapidly developing, disruptive technology that offers an opportunity for U.S.-based solar manufacturers to compete globally. A robust perovskite PV manufacturing industry in the United States will enable a domestic, resilient, and sustainable global PV supply chain<sup>1</sup> critical to realizing U.S. energy security and manufacturing targets. To achieve these goals, additional coordinated investment in the perovskite PV ecosystem is required.

The ability of perovskite semiconductors to produce PV that can operate as an efficient solar cell by itself—and to enable even higher-efficiency tandem modules—has resulted in the rapid advance of its readiness for deployment. In the last 2 years, there has been a significant upward shift in perceptions of the perovskite PV technology readiness level. With substantial investments made outside the United States to enable the

To remain competitive in the global PV market, US-MAP recommends that the following critical investments in a U.S.-based manufacturing ecosystem be made.

1. An immediate and significant increase in federal funding for the perovskite PV ecosystem
2. A strong and sustained federal funding focus on perovskite PV R&D in the areas of reliability, scaling, demonstration, impurity/quality control, and the development of new transport layers
3. Direct support for pilot fabrication facilities that enable the industry to unleash private capital for their own gigawatt-scale commercial fabs
4. A focus on nationwide workforce development that would result in adding at least 1,500 advanced manufacturing jobs per year

<sup>1</sup> U.S. Department of Energy. 2021. *Solar Futures Study*. Washington, D.C.: U.S. Department of Energy. GO-102021-5621. <https://www.energy.gov/sites/default/files/2021-09/Solar%20Futures%20Study.pdf>.



scaling and science simultaneously — including more than 2 gigawatts per year of pilot manufacturing and significant commercial investment in China,<sup>2</sup> as well as a new announcement of nearly \$350 million of investment in Japan, complemented by policy to support perovskite deployment<sup>3</sup>—U.S. action is urgently required. Despite these competing foreign investments, the lower capital costs for perovskite PV compared to silicon technologies offer a window of opportunity for the U.S. industry to innovate and compete. This lower barrier to entry also creates avenues for regional rather than centralized manufacturing and for startups to leapfrog established industry leaders, both of which are critical to enabling supply chain diversity and resilience.

Sustaining U.S. competitiveness in PV requires government support for a burgeoning U.S. perovskite semiconductor and PV ecosystem. This investment would ensure that innovation moves quickly from academia to national and industrial laboratories and would create a level playing field with the rest of the world. U.S.-based manufacturing of perovskites and perovskite-enabled tandem technologies are essential for ensuring resilience against disruptions to PV production, providing domestic and global energy security, creating local jobs, and providing low-cost energy.

These recommendations are the consensus of all the US-MAP members and partners as of September 2024. This consensus was developed at the May 2024 US-MAP Workshop, which was held at the University of Washington Clean Energy Testbeds in Seattle, Washington, with over 95% of the member organizations participating.

Learn more about US-MAP:

[www.usa-perovskites.org](http://www.usa-perovskites.org)



The U.S. Manufacturing of Advanced Perovskites (US-MAP) Consortium works to accelerate successful domestic commercialization of perovskite technologies by prioritizing investments that are critical to establishing a U.S.-based perovskite PV ecosystem and industrial supply chain. This group consisted of representatives from industry (manufacturers, materials suppliers, and equipment vendors), academia, and national labs. This document summarizes the discussion and prioritization from the meeting.

<sup>2</sup> Ruyi, Lu. 2024. "China's Longi Applies for Perovskite Solar Cell Patent." *Yicai Global*. February 9, 2024.

<https://www.yicai.com/news/chinese-solar-panel-giant-longi-applies-for-perovskite-solar-cells-patent#:~:text=Perovskite%20solar%20panels%20will%20likely,analysts%20from%20AskCI%20Consulting%20predict.>

<sup>3</sup> METI. "Perovskite Solar Cells: The Key to the Future Expansion of Renewable Energy in Japan." *METI Agency for Natural Resources and Energy*. February 16, 2024. [https://www.enecho.meti.go.jp/en/category/special/article/detail\\_196.html](https://www.enecho.meti.go.jp/en/category/special/article/detail_196.html).