August 6, 2025

SUBMITTED ELECTRONICALLY

The Honorable Howard Lutnick
Secretary of Commerce
U.S. Department of Commerce
1401 Constitution Avenue NW
Washington DC 20230

RE: Solar Energy Manufacturers for America (SEMA) Coalition Comments on the Notice of Request for Public Comments on Section 232 National Security Investigation of Imports of Polysilicon and its Derivative Products (Docket No. 250709-0121, XRIN 0694-XC128)

Dear Secretary Lutnick:

The Solar Energy Manufacturers for America (SEMA) Coalition thanks the Bureau of Industry and Security at the U.S. Department of Commerce for providing the opportunity to comment on the national security impacts of certain imports of polysilicon and derivative products.

The SEMA Coalition is a group of solar manufacturers united to rebuild the domestic solar supply chain. We represent the interests of the major non-Chinese solar manufacturers who are building or looking to build strategic solar components across the value chain in the U.S. Our coalition advocates for a suite of policies to develop a secure and competitive U.S. solar supply chain to meet our current and future energy demand while creating good-paying manufacturing jobs and protecting our national security.

We respectfully submit the enclosed comments in response to Docket No. 250709-0121 and welcome the opportunity to continue engaging with the Department of Commerce on these important matters.

Sincerely,

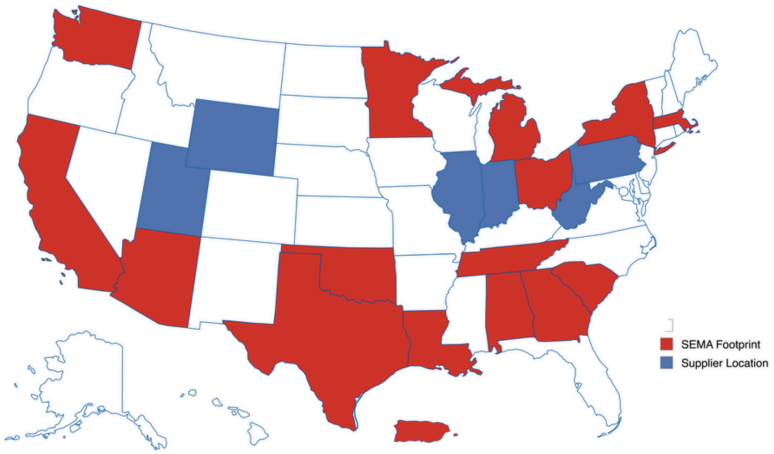
Mike Carr
Executive Director
SEMA Coalition

Background

The United States is undergoing a once-in-a-generation effort to reestablish advanced domestic solar manufacturing and reduce dependence on foreign adversary supply chains. SEMA Coalition members support high-quality jobs across the country (Figure 1). Multiple SEMA Coalition members will open billion-dollar facilities in the next year to strengthen American energy dominance and onshore critical energy manufacturing. The resurgence of the American solar manufacturing sector was initially advanced in 2018 with President Donald Trump's Section 201 safeguard on solar cells and modules. But this revolution must continue to be supported by strong policy signals. With the right trade, tax, and industrial policies, President Trump will further advance the solar manufacturing industry as a key contributor to American energy dominance and national security.

Figure 1: SEMA Coalition Solar Manufacturing Supply Chain Supports Manufacturing Jobs Across the U.S.

SEMA's members represent every step in the value chain, enabling a complete onshoring of the solar manufacturing process.



SEMA's member footprint is wide-reaching, generating high-quality jobs and economic impact in communities across the country.

Crystalline silicon (c-Si) solar technology, invented in the U.S., is quickly becoming one of the world's leading sources of energy. Over 90% of global solar modules are c-Si, the rest being cadmium telluride. Solar deployment is rapidly accelerating across the U.S. utility-scale, commercial, industrial, and residential energy markets. In the utility-scale market, solar and battery storage are expected to make up 80% of total utility-scale capacity additions in the U.S. in 2025. This trend is expected to accelerate.

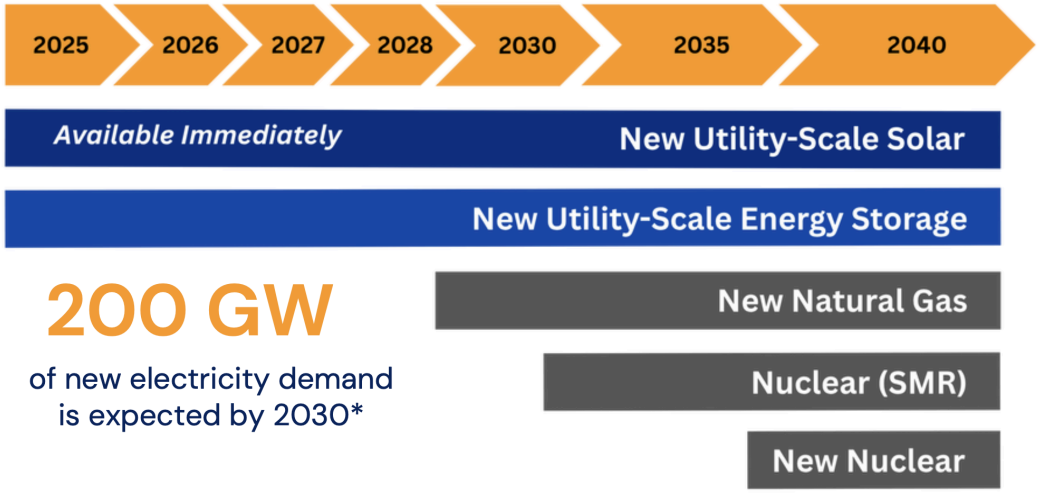
As highlighted in prior SEMA Coalition comment letters, major utilities, energy developers, and AI companies are urging the administration to support policies that deploy additional electrons on the grid as quickly as possible. President Trump has made clear that energy deployment is critical to long-term U.S. competitiveness, economic security, and maintaining low-cost energy for all Americans.

American-made solar and storage are the fastest to deploy and cheapest energy generation options currently available (Figure 2) – and provide a bridge to a future filled with baseload technologies such as natural gas, nuclear, geothermal, hydro, and more. As a result, U.S. solar manufacturing is critical to

meeting the country's increasing energy demand while maintaining secure American energy supply chains.

Unfortunately, China has heavily subsidized its solar manufacturing industry, resulting in a global glut of solar components, sold at below-cost prices. However, various Trump administration officials, including Ambassador Jamieson Greer, have expressed interest in additional trade measures to address these global solar market distortions from China's government. A whole-of-government approach is necessary to counter China's market manipulation. The right course of action would preserve and grow the more than 40,000 good-paying American solar manufacturing jobs and unleash American energy dominance with American-made solar. **The Department of Commerce's investigation of national security threats posed by imports of polysilicon and its derivatives is a necessary part of a whole-of-government approach to strengthen U.S. solar manufacturing supply chains.**

Figure 2: U.S.-Made Solar is Critical to Meeting U.S. Energy Needs During the Trump Administration



*EIA Estimates

Summary Of Recommendations

In 2018, President Trump imposed a gradually diminishing 30 percent global Section 201 tariff on imports of solar modules and cells with a tariff rate quota at the cell level. Despite Chinese-connected interests' efforts to diminish its usefulness, the administration should consider this tariff policy a success in reshoring solar manufacturing and consider how its expiration in February of 2026 will impact the industry. Today, the U.S. has robust polysilicon production, enough module manufacturing to meet its demand, and, for the first time in decades, has solar cell and wafer manufacturing production. Still, U.S. manufacturers are threatened by the same surge in solar imports that Dr. Peter Navarro was discussing in 2018 when the Section 201 tariff was imposed. **The Trump administration should build on the legacy**

of the Section 201 solar tariff to strengthen the entire solar manufacturing supply chain against China's persistent unfair trade practices.

The production of semiconductor-grade and solar-grade polysilicon are inextricably linked. U.S. polysilicon producers rely on the higher volume of solar-grade polysilicon sales to create the necessary economies of scale to produce semiconductor-grade polysilicon. Demand for polysilicon from U.S. and allied supply chain solar manufacturers creates the economic conditions necessary for U.S. semiconductor-grade polysilicon to be produced. Efficient, high-volume production of solar-grade polysilicon makes semiconductor-grade polysilicon economical. **However, China's massive subsidization of its polysilicon industry, rampant overproduction, and price manipulation have distorted the solar-grade polysilicon market, putting semiconductor-grade polysilicon production – essential for military defense systems, critical infrastructure, and everyday technology such as smartphones and cars – at risk.** Thus, Commerce should consider the entire American solar supply chain as critical to maintaining a robust U.S. semiconductor-grade polysilicon industry. The goal should be for the U.S. and allied producers to compete in a fair market and trade environment, without the risks to their businesses posed by the anti-competitive practices of the Chinese and Chinese-linked producers.

Moreover, while the administration has recognized the criticality of semiconductor technology to U.S. national security efforts, we urge the administration to consider the national security implications of losing ground to China in the solar industry, which China designated as an industry of strategic importance in its Made in China 2025 Agenda. In addition to contributing to American energy dominance, solar energy technologies are critical to numerous defense applications in remote environments, including satellites and unmanned aerial vehicles. The warfighter increasingly relies on energy generated from high-efficiency and lightweight solar modules in these devices. Consequently, Commerce should consider the entire U.S. solar supply chain as critical to maintaining our national security interests, given the need for American-made solar in building out domestic energy supply, *as well as* mission-critical defense applications.

Should Commerce make an affirmative finding, trade measures consistent with the following principles would produce the most optimal outcome to follow the first Trump administration's solar manufacturing trade policy success:

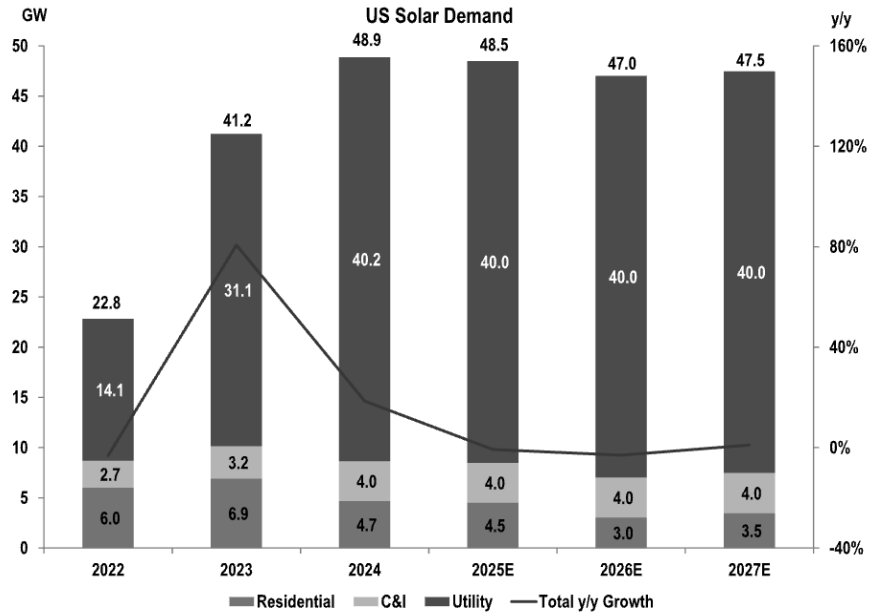
- **As the SEMA Coalition has stated in multiple comment letters, the solar wafers and cell industries are critical choke points that China could weaponize. Commerce must consider how any remedy impacts the full supply chain and should avoid simply pushing a national security vulnerability down the supply chain.**
- **Trade actions must equitably address the full spectrum of derivative imports, including ingots, wafers, cells, and modules. Any link in the U.S. solar manufacturing supply chain that China can exploit is a national security concern.**
- **A remedy should not cover non-Chinese and non-Chinese-linked polysilicon and their derivatives from allied countries, such that imports —when coupled with domestic supply — should ensure enough polysilicon and its derivatives are available to satisfy U.S. solar demand (consistent with the request of a bipartisan congressional delegation).**

Additional Comments and Information Directed at Criteria Listed in § 705.4 as listed in Docket No. 250709-0121

(i) the current and projected demand for polysilicon and its derivatives in the United States;
(ii) the extent to which domestic production of polysilicon and its derivatives can meet domestic demand;
(iii) the role of foreign supply chains, particularly of major exporters, in meeting the United States' demand for polysilicon and its derivatives.

Demand for utility-scale solar has reached 48 GW and will likely stay around this number for the next three years (Figure 3).

Figure 3: Roth Capital Partners July 2027 U.S. Solar Demand



Source: Wood Mackenzie; Bloomberg New Energy Finance (BNEF); Ohm Analytics; Roth Capital Partners estimates.

While the U.S. has sufficient domestic solar module capacity, the availability of domestically manufactured upstream components, including ingots, wafers, and cells, is still lacking (Figure 4). The demand for U.S. solar modules drives the demand for upstream components, including solar-grade polysilicon. U.S. manufacturers are building capacity in each segment of the solar manufacturing supply chain, though at different rates.

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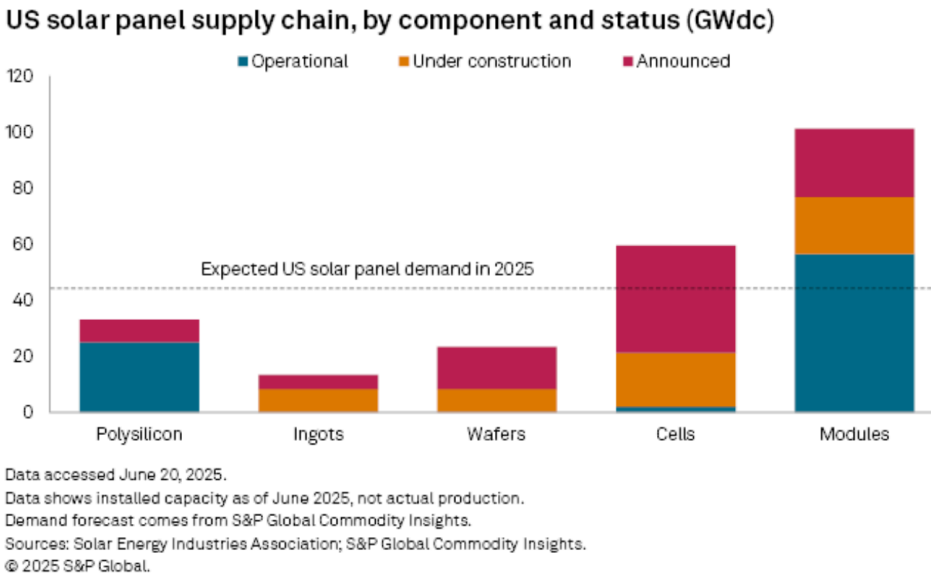
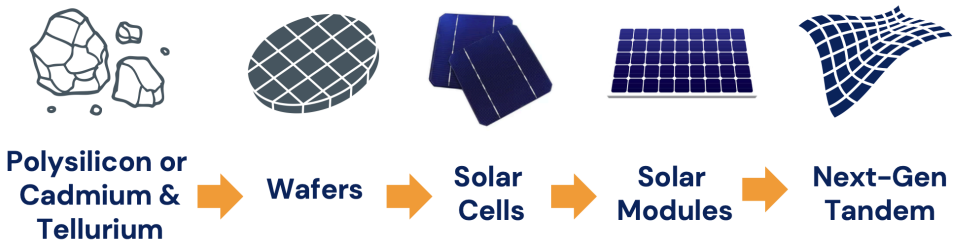
Figure 4: S&P Global Market Insights



The U.S. also retains the leading technology in next-generation tandem solar technologies. These technologies, once commercialized, would incorporate a thin film or perovskite layer in "tandem" with a silicon cell. Scaling the American solar manufacturing industry and commercializing next-generation solar technologies would allow the U.S. to leapfrog China and gain a significant competitive advantage in technology, price, and new solar applications.

Figure 5: SEMA, Solar Value Chain



The production of polysilicon for both semiconductor and solar applications is interconnected. Producing semiconductor-grade polysilicon economically relies on the efficient, high-volume manufacturing of solar-grade polysilicon. This high-volume production of solar-grade polysilicon is crucial for achieving the necessary economies of scale to effectively remove impurities for semiconductor-grade material and to maintain high-capacity utilization in capital-intensive manufacturing facilities. The vast majority of polysilicon is consumed by the solar market. As a result, domestic production of solar-grade polysilicon is essential to preserving U.S. national, economic, and energy security. Furthermore, because the domestic polysilicon industry cannot yet produce sufficient quantities of solar-grade polysilicon to satisfy U.S.

demand, cooperation with reliable polysilicon producers from allies is crucial to ensuring an adequate supply of this critical input to these downstream American industries.

Polysilicon: At the moment, there are two major U.S. polysilicon manufacturers: Hemlock Semiconductor in Michigan (majority-owned by Corning Incorporated) and Wacker Chemie AG with polysilicon operations in Tennessee. According to the U.S. Department of Energy's February 2022 Solar Photovoltaics supply chain report, the U.S. had approximately 20 GW of solar-grade polysilicon production capacity. Since then, REC Silicon exited the U.S. solar polysilicon industry, while Highland Materials announced efforts to build a new 10 GW polysilicon production facility in Tennessee.

Wafer: As the U.S. has no solar wafer manufacturing currently online, domestic polysilicon producers are servicing other markets. Over 10 GW of U.S. solar wafer production is expected to come online this year after multibillion-dollar investments from Qcells in Georgia and Corning in Michigan. Norwegian solar wafer manufacturer, NorSun, has announced a tentative site for an up to 10 GW manufacturing facility in Oklahoma, while German manufacturer, NexWafe, is exploring U.S. sites for a potential 6 GW next-generation wafer manufacturing facility.

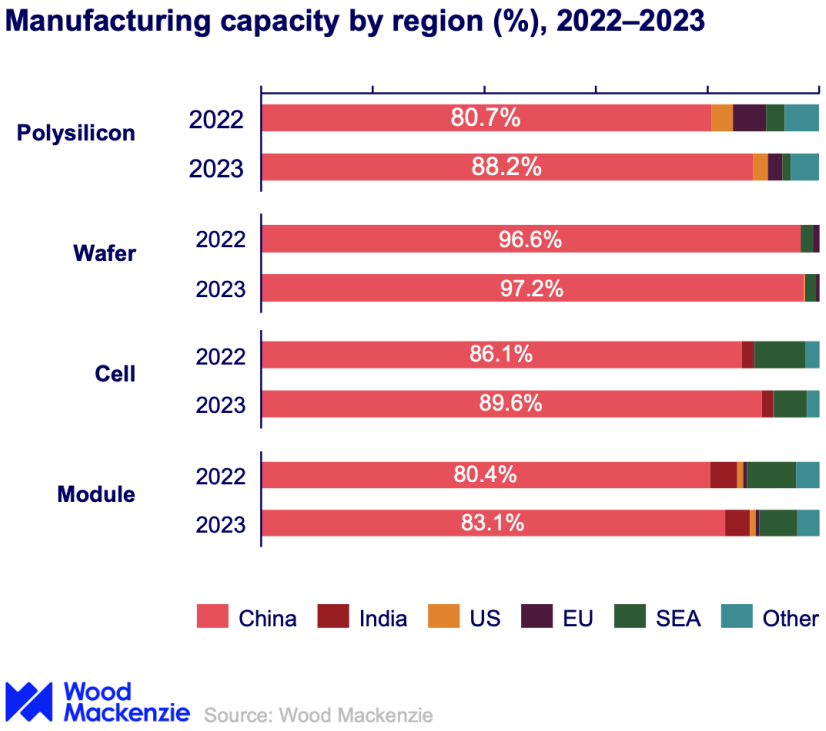
Cell: Only one cell manufacturing facility, Suniva, is currently producing silicon solar cells, with a capacity of 1 GW, while an estimated 12 GW of silicon cell manufacturing facilities are currently under construction. Projects under construction include SEMA members Silfab (1GW) in South Carolina, Qcells (3.3GW) in Georgia, and Talon PV (4GW) in Texas.

Module: SEMA members, including First Solar, Heliene, Qcells, Silfab, Mission, and others, are currently operating module manufacturing facilities. First Solar, Heliene, and Silfab are currently building new module capacity. In total, these manufacturers will operate over 25GW of domestic capacity this year. First Solar alone will have 14GW of U.S. capacity (non-silicon) by next year. A host of Chinese-owned module manufacturing facilities are also in operation in the U.S. However, thanks to the robust Prohibited Foreign Entity provisions in the One Big Beautiful Bill Act (H.R. 1), most, if not all, of these manufacturers will lose access to federal tax credits.

Outside the U.S., most global capacity remains concentrated in Chinese-owned supply chains. However, there is enough non-Chinese or non-Chinese-linked polysilicon to service the U.S. market. Enabled by government subsidies for the polysilicon industry, in 2023, China controlled 97% of the wafer supply chain (Figure 6). Today, China is the leading global producer of polysilicon with a 94.7% total production capacity, comprising 98% of solar-grade polysilicon capacity. Non-Chinese-owned or controlled solar wafer and cell production exists in countries such as South Korea and India, though the timing and scale of this capacity remain unclear. Certain importers have provided Customs and Border Protection (CBP) with sufficient information to satisfy their traceability concerns, but other supply chains have proven to be difficult to assess.

Commerce should focus trade actions on Chinese-owned and linked supply chains. A remedy should be structured to exclude polysilicon from allied countries such that imports —when coupled with U.S. supply— should ensure enough non-Chinese or non-Chinese-linked polysilicon is available to satisfy U.S. solar demand. We recommend that Commerce engage with CBP to fully assess the traceability of allied supply chains and implement strong traceability standards to ensure air-tight compliance with any remedies.

Figure 6: Solar-grade Polysilicon Manufacturing Capacity by Region



(vi) the economic impact of artificially suppressed prices of polysilicon and its derivatives due to foreign unfair trade practices and state-sponsored overproduction;

Chinese-owned solar companies have artificial market advantages

The U.S. has the technology, capital markets, and workforce to compete and win when there is a level playing field. The world's most valuable solar manufacturer is not Chinese, it's American – First Solar – with manufacturing facilities in Ohio, a new $1.1 billion factory in Alabama, and a $1.1 billion factory in Louisiana set to open in the coming months. The largest non-Chinese crystalline silicon solar manufacturer in the world, Qcells, has invested more than $2.5 billion in Georgia to build the first vertically integrated c-Si ingot and wafer plant set to open this year. Corning will also open a $1.5 billion wafer manufacturing facility, the largest outside of China, this year. Recently, several of our members announced a collaboration to form the first polysilicon-based U.S. solar supply chain with Hemlock polysilicon, Corning wafers, Suniva cells, and Heliene.

Policy-driven excess capacity by Chinese-owned solar companies has made it nearly impossible for U.S. manufacturers and their workers to compete without trade and tax interventions that correct for China's aggressive and persistent market manipulation. As discussed in SEMA's October 22, 2024, submission to USTR on the proposed modifications to 301 tariffs on polysilicon, solar wafers, and ingots, we are concerned that the U.S. will continue to be flooded with heavily subsidized Chinese-made solar imports. As demonstrated in Figures 7 and 8 below, the scale, supply chain control, and subsidies of China's solar giants loom large over the industry. China's policy-driven excess supply is a form of market manipulation

that impacts U.S. investment decisions, including decisions to invest in innovative approaches to manufacturing solar components.

Chinese polysilicon producers have generated a significant surplus in the global solar-grade polysilicon market. This excessive production has led to the flooding of global markets with solar-grade polysilicon at artificially low, non-market prices—less than 20% of the minimum sustainable price of $24/kg identified by the U.S. Department of Energy's National Renewable Energy Laboratory (NREL). This severe oversupply is evident across all segments of China's global supply chain (Figure 7).

Figure 7: NREL, Global Excess Capacity

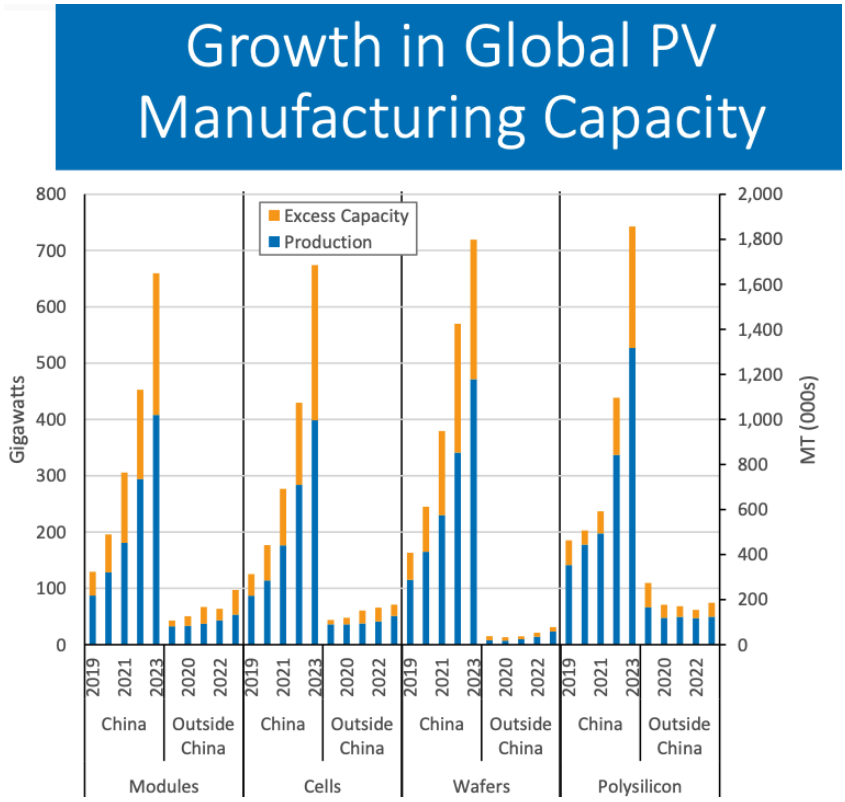


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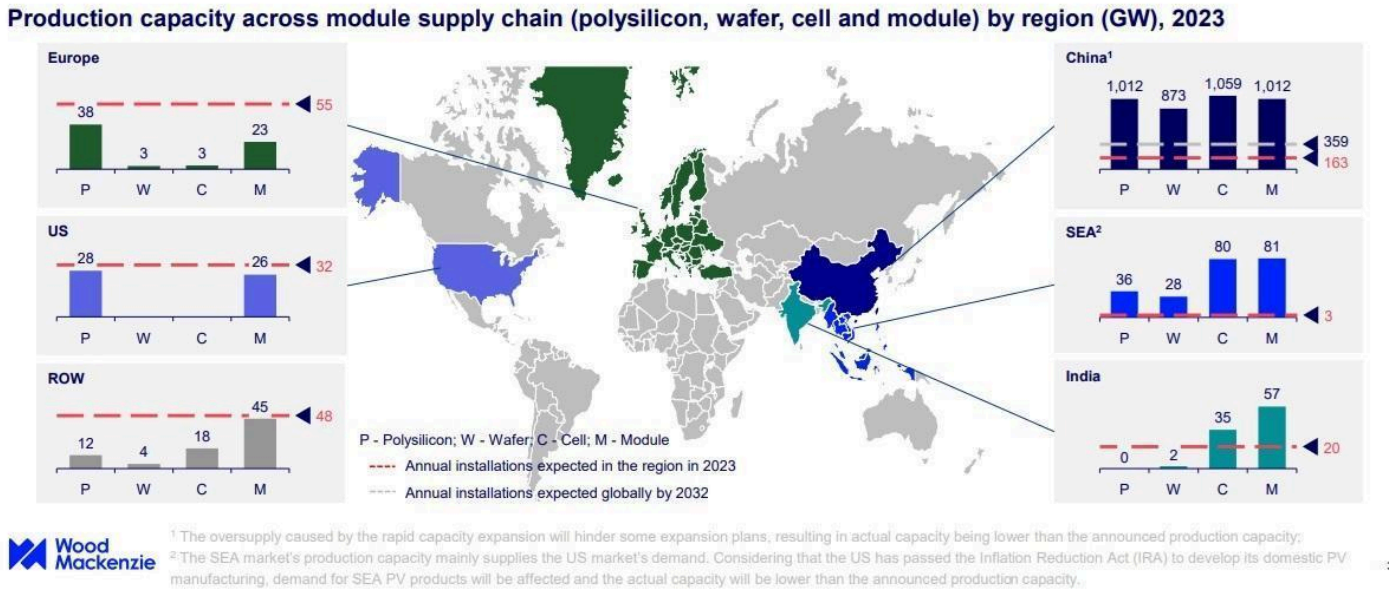
Figure 8: Wood Mackenzie, China's Capacity Exceeds Expected 2032 Global Installations



Current Trade Policy and Government Actions Have Provided Short-Term Relief, but Have Not Prevented Market Manipulation

The limits of U.S. trade policy in constraining unfairly traded Chinese products can be clearly seen in the existing stockpile of Chinese-made modules in the U.S. Wood Mackenzie estimates the U.S. had between 40 GW and 50 GW of solar panel inventory as of the end of 2024, while BNEF pegged the number at more than 50 GW. The following measures, while providing vital relief, are not sufficient to counter China's efforts to manipulate the U.S. solar market.

Uyghur Forced Labor Prevention Act

While not a trade matter, Secretary of State, and then Senator, Marco Rubio's championing of the Uyghur Forced Labor Prevention Act (UFLPA) has played a meaningful role in deterring the abhorrent use of Uyhgur forced labor in U.S. supply chains, including the solar supply chain. At the time of UFLPA's passage, nearly half of global polysilicon production came from Xinjiang, where polysilicon is produced by Uyghurs and other minorities under conditions of forced labor. Polysilicon is a high-priority sector under the UFLPA, and SEMA commends the administration's recent efforts to increase UFLPA enforcement and form the Department of Justice's Market Integrity and Major Frauds (MIMF) unit to tackle UFLPA and trade violations. However, tracing the supply of U.S. and allied polysilicon through the global wafer supply can be difficult, given China's laws that attempt to prevent the enforcement of the UFLPA. Bad actors will continue to find ways around the UFLPA's requirements, so more must be done to ensure the UFLPA and trade policies are air tight to prevent subversion. While UFLPA created an initial positive impact, as Chinese companies and their affiliates learned to manipulate the rules, the initial positive impact of the law quickly diminished.

Section 201

President Trump's Section 201 Solar Safeguard has provided a base level of protection against China's market manipulation. However, the bifacial loophole of the Section 201 Safeguard made this regime ineffective for many years. The current 14% tariff on solar modules and cells is not nearly sufficient to counter China's subsidized supply chains and is set to expire in February 2026.

Section 301

In the four-year review of President Trump's Section 301 tariffs on China's imports (Section 301 Investigation into China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation), the SEMA Coalition urged the prior administration to increase the Section 301 tariffs on solar polysilicon, ingot, and wafer imports to 50 percent. These 50 percent tariffs, effective on January 1, 2025, provided some relief to the U.S. manufacturing industry and set an important precedent. However, this tariff has proven ineffective at curbing imports of Chinese and Chinese-linked polysilicon which enter the U.S. through third countries or in certain derivative products. Most Chinese-owned and Chinese-linked solar manufacturers exporting to the U.S. operate in Southeast Asia while still relying on the supply chain in China.

Antidumping and Countervailing (AD/CVD) Actions

U.S. solar manufacturers rely on a "whack-a-mole" AD/CVD trade enforcement regime to counter Chinese market manipulation as Chinese-owned manufacturers continue to move countries to avoid U.S. tariffs. Chinese module manufacturing can be moved to a new country in under a year. The previous administration's decision to allow Chinese-owned companies to suspend paying AD/CVD orders for two years was one of the most harmful policies of the last four years. Chinese-owned companies, located in Southeast Asia (Cambodia, Vietnam, Thailand, and Malaysia), which made up around 80 percent of U.S. solar imports, were allowed to avoid these duties. Despite a bipartisan strong warning from Congress through the use of the Congressional Review Act, President Biden doubled down by issuing a veto threat against congressional action to reverse the duty suspension. Reports in the Wall Street Journal and The Guardian outline how this action undermined U.S. trade laws and resulted in the cancellation of planned U.S. factories.

As of June 24, 2025, final AD/CVD orders were put in place on imports of silicon cells and modules from Cambodia, Vietnam, Thailand, and Malaysia. During this investigation, Laos and Indonesia became new Chinese solar "manufacturing" hubs. As of July 17, 2025, Commerce is also engaged in an AD/CVD investigation into imports of silicon modules and cells from Laos, Indonesia, and India. This is the fourth AD/CVD investigation into the same Chinese companies. We expect that these companies will repeat history and once again move countries to avoid AD/CVD orders.

(vii) the potential for export restrictions by foreign nations, including the ability of foreign nations to weaponize their control over supplies of polysilicon and its derivatives;

Over the long term, the SEMA Coalition believes the U.S. must have a robust manufacturing capacity in all segments of the solar supply chain – polysilicon, ingot, wafer, cell, and module – to maintain U.S.

energy security and meet our long-term energy needs. China's control over parts of the solar supply chain is a concern for the broader energy sector. While Chinese-owned suppliers are currently highly competitive with one another in sales to the U.S. market, this could easily change with policy direction from China's government.

China's government has increasingly sought to influence the direction of companies in strategic sectors, including solar, to achieve its geopolitical aims. Chinese-owned solar companies have deep ties to China's government, which has for decades directed the growth of the industry. China's government is already using policy levers to restrict access to semiconductors, rare earth magnets, battery components, and critical minerals that could stifle U.S. competition. Recent measures taken by the Chinese government to limit the export of strategic minerals used in solar manufacturing indicate that China is willing to weaponize influence over the solar supply chain for its strategic and economic aims.

We are concerned by the prospect of China restricting necessary components of the solar supply chain and the residual impacts. For example, as previously mentioned, China's price manipulation of solar-grade polysilicon is impacting non-Chinese producers of both solar- and semiconductor-grade polysilicon, which could have lasting effects on both supply chains if the market conditions are left unaddressed.

Solar In Defense Applications

Solar technology is vital for many defense and strategic communications applications. Solar technologies enable significantly higher mission-lifetime energy yields for unmanned aerial devices, naval equipment, and space communication applications. The Department of Defense's (DoD) Space Technology Roadmap includes near-term investments in advanced solar technology, and the Operational Energy-Innovation (OE-I) directorate included advanced space-qualified photovoltaics. The U.S. Army, through the Accelerate the Procurement and Fielding of Innovative Technologies (APFIT) program, and the U.S. Navy are currently using solar-powered unmanned aircraft systems that can stay in the air for days, possibly weeks, providing significant surveillance and communications advantages. These investments build upon U.S. national lab research in space-based photovoltaics and investments made by the Intelligence Advanced Research Projects Activity (IARPA) SOLSTICE program.

Recently, Congress weighed in on the importance of domestic solar supply chains in defense applications, in the *House Armed Services Committee FY26 National Defense Authorization Act: Division A—DoD Authorizations; Title XVI—Space Activities:*

> *The committee recognizes the importance of the domestic production of solar panels which are hardened to withstand the harsh environment of space, a critical component of our nation's space industrial base. Space solar panels are indispensable for ensuring reliable power generation for satellites, spacecraft, and other vital systems. The committee also recognizes the urgency of accelerating the domestic production of alternative space solar technology, as recent measures taken by the Chinese government to ban the export of strategic minerals, specifically gallium and germanium threaten to cut off the world's largest supplier of these minerals, dramatically increasing already extremely high costs and extremely long lead times associated with legacy technology. By fostering a robust domestic manufacturing capability for space-stable silicon solar panels, we can reduce our reliance on foreign supply chains, mitigate potential vulnerabilities, reduce costs and lead times, and generally enhance our nation's ability to maintain our leadership in space exploration and defense.*

Commerce should seek input from the U.S. DoD regarding supply chain vulnerabilities for critical power generation on satellites, drones, and other technologies incorporating solar energy used by the warfighter.

Conclusion

Commerce should consider the entire U.S. solar supply chain as critical to maintaining our national security interests, given the need for U.S.-made solar in mission-critical defense applications, U.S. energy dominance, and the semiconductor supply chain. Should the Commerce Department make an affirmative finding, trade measures consistent with the principles outlined would produce the most optimal outcome to follow the first Trump administration's solar manufacturing trade policy success. We greatly appreciate your attention to these matters and stand ready to serve as a resource.