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Via Regulatory Portal

Ms. Katherine Reid
Director, Office of Strategic Industries and Economic Security
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue, NW
Washington, D.C. 20230

cc. Mr. Stephen Astle, Director, Defense Industrial Base Division, Office of Strategic Industries and Economic Security

Re: Notice of Request for Public Comments on Section 232 National Security Investigation of Imports of Semiconductors and Semiconductor Manufacturing Equipment, Docket No. 250414-0066, XRIN 0694-XC121

SEMI appreciates the opportunity to respond to the U.S. Department of Commerce Bureau of Industry and Security's ("BIS") *Notice of Request for Public Comments on Section 232 National Security Investigation of Imports of Semiconductors and Semiconductor Manufacturing Equipment*, 90 Fed. Reg. 15950 (April 16, 2025) (the "Notice"). In providing these comments, SEMI hopes to play a constructive role in furthering the goals of the Trump Administration to bolster the security, resilience, competitiveness, and capacity of the U.S. semiconductor, semiconductor manufacturing equipment ("SME"), and materials industries.

SEMI is a global semiconductor industry association with over 650 U.S.-headquartered member companies in the semiconductor and electronics supply chain that aims to foster connection, collaboration, and innovation among its members. SEMI also regularly engages with policymakers and regulators to promote various industry-wide initiatives on behalf of its members, including fortifying the electronic supply chain, developing the industry's workforce, and identifying key areas for research and development ("R&D") funding.

I. INTRODUCTORY COMMENTS

SEMI members support the Trump Administration's goals of securing the semiconductor supply chain and strengthening the domestic semiconductor and SME industry and share the Administration's position that these are vital for U.S. economic and national security, innovation leadership, and defense readiness.

In short, SEMI members believe it is essential that, in seeking to bolster and secure the domestic semiconductor and SME supply chain, the Department of Commerce must prioritize the need to pursue feasible, long-term results. Sweeping measures, including steep, broad-based tariffs

could erode U.S. competitiveness, weakening innovation, and impeding access to critical inputs required for U.S. manufacturing, ultimately undermining U.S. national security and economic security interests.

As highlighted below, the semiconductor ecosystem is globally dispersed, and the supply chain is made up of highly complex segments, some of which are concentrated among a relatively small number of entities with highly specialized capabilities, resources, and access to critical materials and expertise that cannot be reasonably replicated or transferred within a commercially viable timeframe. Many of the domestic industry's supply chain partners are located in countries that are longstanding geopolitical allies of the United States who play a critical role in furthering U.S. national security interests, and whose markets for U.S. semiconductor exports account for the majority of revenue of the domestic industry. SEMI members recommend herein several measures that could help bolster the capabilities and capacity of the domestic industry, support U.S. manufacturing expansion amid an increasingly competitive international landscape, and increase supply chain resiliency without the downside risks of non-targeted tariffs or import quotas. Such measures include: (1) continuing to utilize and build upon existing investment incentives; (2) establishing a comprehensive strategy to develop the workforce that will be needed to maximize the success of the domestic industry; and (3) strengthening ties with trusted global trading partners to address supply chain vulnerabilities.

If the Department of Commerce assesses that a national security risk from semiconductor imports exists and determines that tariffs or import quotas are necessary pursuant to Section 232 of the Trade Expansion Act of 1962, as amended (hereinafter "Section 232 Investigation"), SEMI members respectfully urge that these be narrowly targeted and implemented in a gradual, phased-in approach to minimize supply chain disruptions. To be strategic and effective, SEMI members believe such measures must be informed by the nuances of the various types of semiconductors, SME, and downstream derivative products, the global supply chains unique to each of these semiconductor, SME, and derivative types, the availability of the inputs used to produce these items, and the feasibility of moving certain supply chain segments from adversarial nations to allied and more proximal destinations.

SEMI members offer these comments, including their data and analysis on the global semiconductor and SME ecosystem, to help inform an effective approach: one that strengthens and increases the domestic industry's capacities, supports U.S. semiconductor manufacturing, protects the domestic industry's globally dominant strengths, and strengthens the successful international partnerships and supply networks essential to the domestic industry's resilience and continued development.

II. SEMI COMMENTS REGARDING THE ISSUES RELEVANT TO THE SECTION 232 INVESTIGATION

A. Domestic Demand for Semiconductors Is Growing Rapidly.

The increasing demand for legacy, trailing edge, and advanced semiconductors both domestically and abroad reflects the degree to which semiconductor technology and supply chain resiliency will determine the future economic and national security of the United States and its

status as a global economic leader. The below chart provides a small sampling of some of the fastest growing areas of demand for advanced semiconductors in particular.

End Market/Application	Examples of Use Cases ¹
Automotive Electronics	Driver-assistance systems, infotainment, battery management, inverters
Computing and data storage	Central processing units (“CPUs”) and graphical processing units (“GPUs”), high-bandwidth memory (HBM), solid-state drives, network flash storage, data centers
Consumer electronics	Smart-home devices, wearables, watches, and hearables.
Industrial electronics	Robotics, industrial automation, grid management, medical devices
National security and military	Advanced radar and surveillance systems, communication devices, navigation systems, and weaponry
Wired communications	Routers, modems, fiber optic communications
Wireless communications	IoT, base stations, antennas, smartphones

Domestic demand for a wide range of semiconductors—and the SME required to produce them—has been consistently increasing across a range of semiconductor types and is expected to continue increasing over the next decade. Rising demand in the United States and other countries within the Americas, in particular, has been a major driver of overall global demand.² The value of the U.S. semiconductor market is projected to increase an average of 12 percent annually in each of the next five years.³

This increased domestic demand is being driven in large part by the expansion and advances in technology related to artificial intelligence (“AI”), automotives, cloud computing, Internet of Things (“IoT”) devices, and consumer electronics. AI, in particular, is driving the demand for the most advanced, high-value semiconductors and related SME and will be critical to America’s global economic leadership.⁴ The semiconductors critical to AI include so-called “gen AI chips,” a mix of CPUs, GPUs, HBM, data center communications chips, memory, and power

¹ Chris Musso, Guttorm Aase, and Mark Patel, *Creating A Thriving Chemical Semiconductor Supply Chain in America* (Mar. 25, 2025), <https://www.mckinsey.com/industries/chemicals/our-insights/creating-a-thriving-chemical-semiconductor-supply-chain-in-america#/>.

² During the month of February 2025, year-to-year global sales of semiconductors increased by over 17 percent for the tenth consecutive month, while year-to-year sales within the Americas alone increased an estimated 50 percent. Press Release, Semiconductor Industry Association (SIA), *Global Semiconductor Sales Increase 17.1% Year-to-Year in February* (Apr. 5, 2025), <https://www.semiconductors.org/global-semiconductor-sales-increase-17-1-year-to-year-in-february/>.

³ Chris Musso, Guttorm Aase, and Mark Patel, *Creating A Thriving Chemical Semiconductor Supply Chain in America* (Mar. 25, 2025), <https://www.mckinsey.com/industries/chemicals/our-insights/creating-a-thriving-chemical-semiconductor-supply-chain-in-america#/>.

⁴ The White House, *Fact Sheet: President Donald J. Trump Takes Action to Enhance America’s AI Leadership*, (Jan. 23, 2025), <https://www.whitehouse.gov/fact-sheets/2025/01/fact-sheet-president-donald-j-trump-takes-action-to-enhance-americas-ai-leadership/>

chips, among others, that are used in generative AI, traditional AI (machine learning), or both. Gen AI chips are often destined for large cloud data centers and cloud-based AI systems, which are expected to increasingly be used in enterprise edge devices, computers, smartphones, and IoT devices.

A report published by Deloitte in February 2025 illustrates the growth of semiconductor demand as a whole and gen AI chips in particular, noting that the combined market capitalization of the top 10 global chip companies was \$6.5 trillion—up 93% from \$3.4 trillion in mid-December 2023 and 235% higher than the \$1.9 trillion seen in mid-November 2022.⁵ The most significant growth was experienced among companies with exposure to high-value gen AI chips, even as this category of chips represents only 0.2 percent of the total volume of wafers sold.⁶

One of the first executive orders issued by President Trump established that “it is the policy of the United States to sustain and enhance America’s global AI dominance in order to promote human flourishing, economic competitiveness, and national security.” These national AI-related policies and goals will be severely hampered if tariffs are broadly imposed upon the semiconductor industry.

B. Domestic Semiconductor and SME Production Capacity and the Role of Foreign Fabrication and Global Supply Chain Partners

1. Domestic Production Capacity Will Significantly Increase as a Result of Major Recent Investments.

The domestic semiconductor and SME industry is deeply integrated into an interdependent global network of highly specialized companies that make up the semiconductor ecosystem. While U.S. domestic semiconductor production capacity continues to increase at an impressive rate, it remains insufficient to meet total domestic demand across a wide range of semiconductors and SME. Major investments will continue to significantly increase U.S. domestic semiconductor production capacity in the coming years, bolstering the resilience and security of the U.S. semiconductor ecosystem and increasing the competitiveness of the domestic industry as a whole. These investments include nearly a half trillion dollars, much of which has been spurred through incentives, grants and loans, and other credits provided to companies under the bipartisan *CHIPS and Science Act*⁷, the semiconductor Advanced Manufacturing Investment Tax Credit (ITC), regulatory reform, and more recently through the Trump Administration’s United States Investment Accelerator.⁸

⁵ Deloitte, *2025 Global Semiconductor Industry Outlook* (Feb. 4, 2025), <https://www2.deloitte.com/us/en/insights/industry/technology/technology-media-telecom-outlooks/semiconductor-industry-outlook.html>.

⁶ *Id.*

⁷ According to industry reports, as of March 2025, \$540 billion in announced private investments were spurred by the CHIPS Act. See SIA, *America’s Chip Resurgence: Over \$540 Billion in Semiconductor Supply Chain Investments* (updated as of Mar. 7, 2025), <https://www.semiconductors.org/chip-supply-chain-investments/>.

⁸ Executive Order Establishing the United States Investment Accelerator: <https://www.whitehouse.gov/presidential-actions/2025/03/establishing-the-united-states-investment-accelerator/>.

In total, U.S. domestic semiconductor manufacturing capacity today accounts for an estimated 10 percent of the global market.⁹ As a result of the rapid uptick in investments facilitated by the U.S. government, between 2022 and 2032, the domestic semiconductor fabrication capacity is projected to increase by 203 percent, vastly outpacing the 11 percent increase in capacity achieved between 2011 and 2022.¹⁰ Furthermore, at this rate, domestic semiconductor production capacity will experience a more dramatic increase than any other country during this period.

SEMI members applaud the efforts and the early success of the Trump Administration in boosting the resiliency of the domestic supply chains. Importantly, these efforts will take time and continued investment both in terms of capital, infrastructure, and workforce development to bear fruit. Moreover, as we discuss below, given the high degree of specialization within the global semiconductor ecosystem, increased domestic production capacity will not be evenly distributed across the entire range of semiconductors and SME (and the other required inputs for these items) that are essential to national and economic security. In order to achieve greater self-sufficiency in the semiconductor supply chain, SEMI members urge the Administration not to impose duties on inputs necessary to increase manufacturing capacity. Efforts to reduce dependences through untargeted tariffs or import quotas risks undermining resilience by dramatically increasing costs and stifling innovation. Rather, SEMI members strongly believe that the Administration should promote growth-oriented policies that bolster supply chain resiliency, competitiveness, and security.

2. The Domestic Industry's Position in the Global Semiconductor and SME Supply Chain

To understand the challenges inherent to building additional capacity across the full range of semiconductor and SME types, it is necessary to underscore the complexity and specialization within the global semiconductor and SME supply chain. To briefly summarize, the semiconductor and SME supply chain broadly requires, among other things, companies that can undertake the following specialized activities:

- **Design:** Designing and developing a nanometer-scale integrated circuit to function in a particular type or category of electronic device,
- **EDA & Core Design:** Designing core intellectual property (IP) and electronic design automation (EDA) software and related services that are used to develop or design semiconductors and SME,
- **Manufacturing SME:** Manufacturing SME, which generally falls into three categories: lithography, deposition, and materials removal & cleaning equipment,
- **Supplying Materials:** Producing highly specialized materials and other inputs required for semiconductor and SME production, including preparing and extracting polysilicon, manufacturing inputs like bare wafers, photomasks, photoresist chemicals, wet processing

⁹ Richard Elkus Jr., *A Strategy for The United States to Regain its Position in Semiconductor Manufacturing* (Feb. 13, 2024), <https://www.csis.org/analysis/strategy-united-states-regain-its-position-semiconductor-manufacturing>; BCG, SIA, *Emerging Resilience in the Semiconductor Supply Chain* (2024), https://www.semiconductors.org/wp-content/uploads/2024/05/Report_Emerging-Resilience-in-the-Semiconductor-Supply-Chain.pdf.

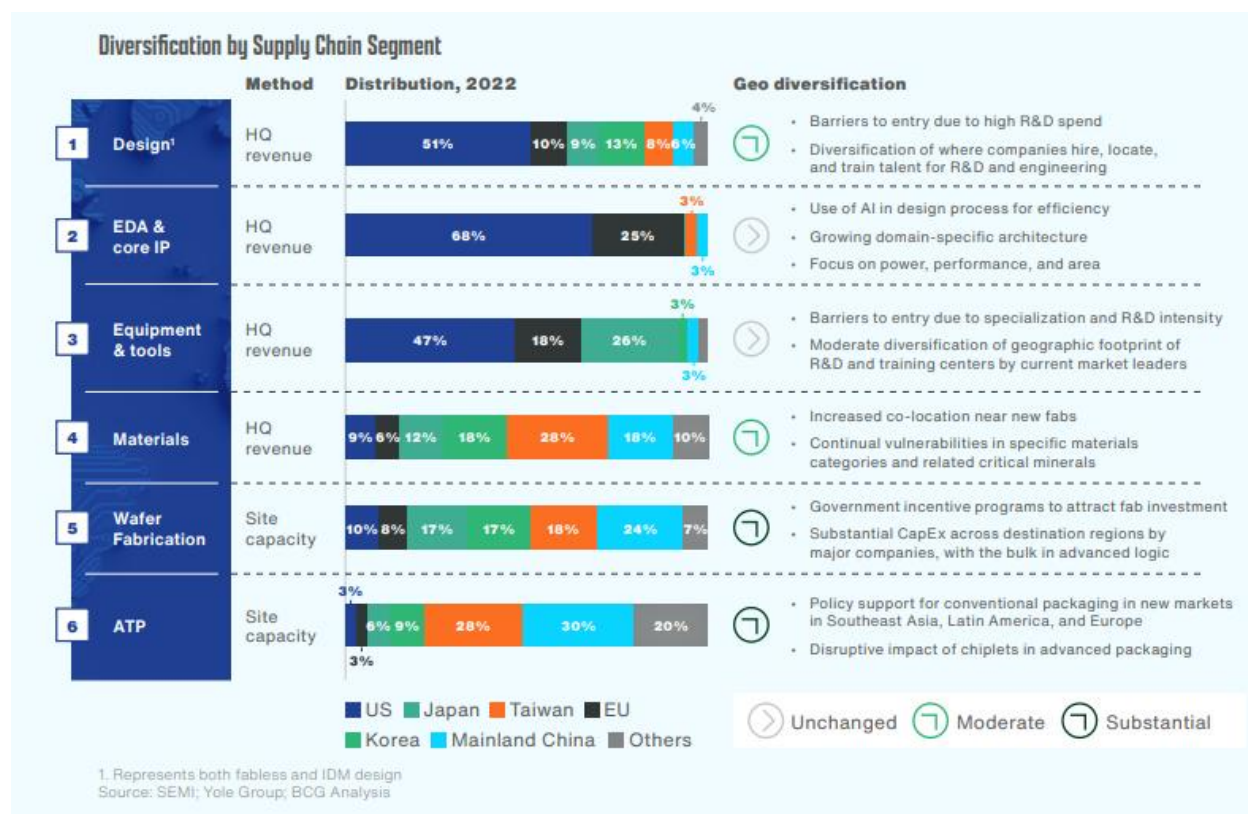
¹⁰ *Id.*

chemicals, gases, chemical mechanical planarization slurries as well as leadframes, organic substrates, ceramic packages, encapsulation resins, bonding wires and die-attach materials,

- **Fabrication:** The process of manufacturing finished chips from raw semiconductor material.
- **Assembly, Testing, and Packaging (ATP):** ATP is when integrated circuits are tested and packaged so that they can be used in electronic devices.

The above represents only a snapshot of the steps that make up the semiconductor and SME manufacturing process. In practice, moving from the initial design stage to the manufacturing-intensive fabrication phase, and then to the final ATP phase often involves over a thousand steps, requiring highly specialized materials, production facilities, technology, equipment, software, chemicals, expertise, and access to labor. The degree of specialization, in addition to various local investment and policy initiatives, has resulted in certain segments of the global semiconductor ecosystem becoming concentrated among a relatively small number of markets and companies that specialize in highly specific supply chain segments or sub-segments.

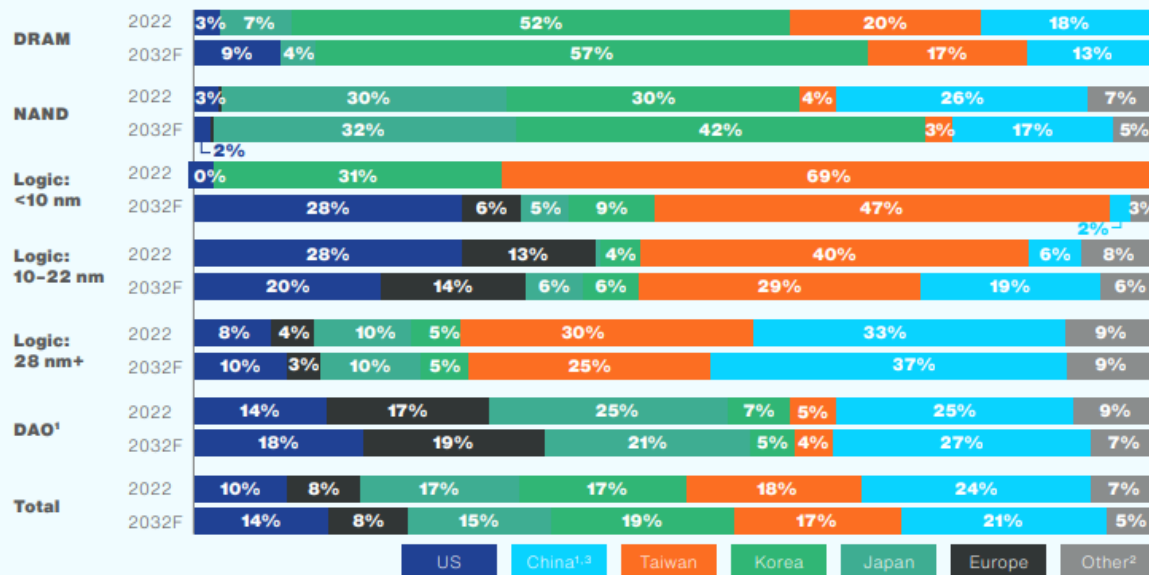
U.S. share of global manufacturing capacity declined from a relative peak of 37% in 1990 to 10% in 2022. The decline in market share is partially attributable to U.S.-based semiconductor manufacturing facilities facing a significant cost disadvantage. Governments around the world have heavily invested in the development of their own semiconductor manufacturing industries. This competitive spirit embodied by allies and rivals alike—in combination with their comparatively lower labor costs, as well as an increasingly costly and burdensome regulatory, tax, and permitting environment in the United States—over time resulted in a downsizing of America’s share of global semiconductor investments compared to other nations. A report issued by SIA and the Boston Consulting Group (BCG) found that the total construction and operating costs of a semiconductor wafer fab in the United States is 30-50% more expensive than in Asia. Starting in 2020 during the first Trump Administration, the U.S. took a critical step toward an investment-driven approach to revitalize a robust semiconductor ecosystem in the United States, and those investments are just starting to pay off. To overcome longstanding cost disadvantages, it is imperative to sustain government/tax incentives and remove regulatory and permitting barriers in order to drive future investments in the U.S. semiconductor ecosystem.



Among certain supply chain segments, U.S.-based companies hold a dominant or significant relative market share. These include some of the most high-value segments of the semiconductor supply chain, namely, designing advanced semiconductors, developing the core intellectual property that undergirds electronic design automation (*i.e.*, design software), and other extremely R&D-intensive, non-manufacturing segments of the supply chain. In other areas, such as SME manufacturing, the United States's global market share is also significant.

Critically, each country's domestic semiconductor fabrication or SME manufacturing capacity or market share is not uniformly distributed across *all* types of semiconductor or SME. Rather, among each different type of semiconductor or SME, different countries have developed particular specializations, which require decades of R&D investment and strategic business decisions to focus efforts on critical, but niche, sectors. The below chart illustrates the degree to which certain countries specialize or dominate production capacity for particular types of semiconductors.

Global wafer fabrication capacity¹ by technology category by region, 2022 (top) and 2032 Forecast (bottom) (%)

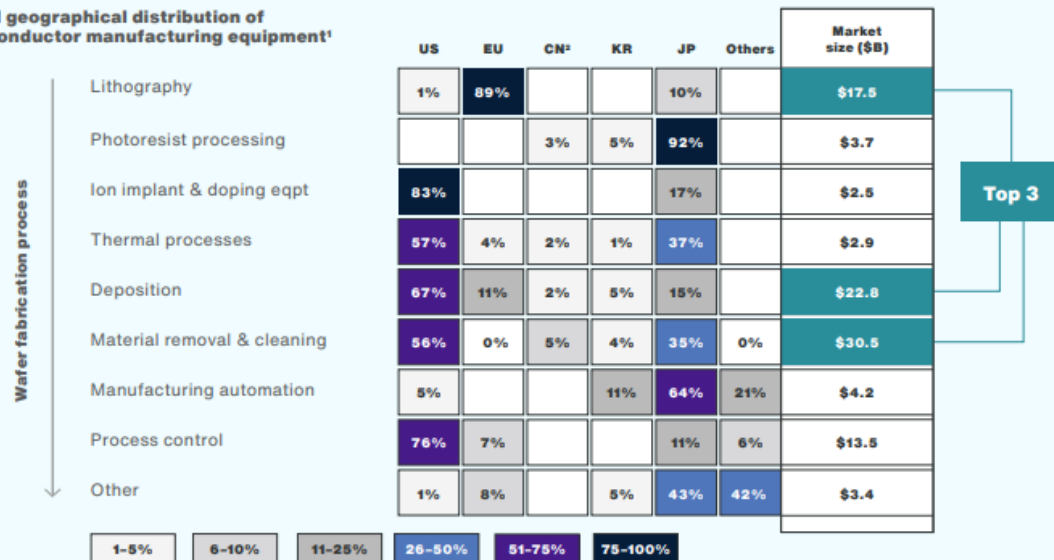


1. Discretes, analog, and optoelectronics & sensors; 2. Others includes Malaysia, Singapore, India, and the rest of the world; 3. Mainland China
 Note 1: Looked at fabs with over 5K+ wspm and 8+ inch wafer size; excluded R&D fabs.
 Note 2: May not total 100% due to rounding.
 Source: Department of Commerce; SEMI; BCG Analysis

As with semiconductor fabrication, a country's capacity to manufacture SME also varies greatly among the various types of SME. For example, as the chart below illustrates, certain lithography tools essential for the production of the most advanced, high-value types of semiconductors, are assembled largely by companies headquartered in the EU, while the U.S. domestic industry holds a dominant position in manufacturing ion implant and doping equipment and process control SME. It is important to reiterate that the semiconductor supply chain is highly globalized, and that foreign-headquartered SME producers – on which U.S. chipmakers are heavily reliant – are themselves reliant on U.S. intellectual property and content.

Semiconductor manufacturing equipment vendors, by HQ region revenue

Global geographical distribution of semiconductor manufacturing equipment¹



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232 duties should not stack

Semiconductor manufacturing equipment (SME) are highly complex systems made up of thousands of components, including steel, aluminum, and semiconductors that are already subject to existing tariffs under Sections 232 and 301. While the industry received limited relief from reciprocal tariffs on April 11, 2025, SME supply chains remain exposed to multiple layers of duties imposed through distinct trade actions.

The imposition of additional Section 232 duties on semiconductors, SME, and their derivatives would lead to a situation in which SME items are subject to overlapping, “stacking” tariffs under multiple Section 232 actions. This risk is further compounded by the administration’s ongoing Section 232 investigation into critical minerals, several of which are key inputs to SME. From both financial and operational perspectives, complying with these overlapping regimes is extraordinarily burdensome.

SEMI members ask that any new tariffs resulting from this investigation be structured to prevent duplication of Harmonized Tariff Schedule (HTS) codes across Section 232 annexes. SEMI Members believe that BIS should establish a clear “non-stacking” framework, similar to what was adopted for the automotive sector on April 29, 2025. In addition, SEMI members ask that BIS initiate consultations with industry stakeholders prior to the effective date of any new measures, to ensure clarity and operational readiness.

Furthermore, given the widespread use of semiconductors and their derivatives within SME and its components -- many of which are also captured in the current investigation. SEMI

members ask that SME and SME components not be included in the annexes governing semiconductor derivatives. If a decision is made to include such items, SEMI members urge the establishment of a reasonable minimum semiconductor content threshold before such components are considered derivatives.

The business strategies of multinational companies (MNCs) rely on integrated, highly calibrated global supply chains to source parts and components. Many critical inputs for SME's come from sole-source suppliers located outside the United States. Given these realities, if Section 232 tariffs are imposed on finished SME, SEMI members urge BIS to establish a robust, transparent exclusion process that permits targeted relief where warranted. Such a mechanism would strike a reasonable balance between national security objectives and the practical realities of the domestic industrial base, while helping to preserve the global competitiveness of U.S. companies and avoid unintended harm to U.S. industry – securing global supply chains stability and resilience.

In addition, SEMI members strongly recommend that any tariffs be implemented on a delayed or phased basis. This approach recognizes the complexity of semiconductor supply chains and allows companies time to adapt, thereby mitigating both compliance challenges and financial burdens—also promoting global supply chain stability and resilience.

C. Feasibility of Expanding Domestic Production Capacity

Broadly increasing domestic semiconductor and SME production capacity is an economic and national security imperative that will require strategic, long-term policies that are carefully tailored to support these efforts, particularly as the specialization on advanced, niche industries in some instances will require decades of planning, investment, and research to execute. To be effective, such policies must facilitate and incentivize further public and private investment, as exemplified by the Trump Administration's U.S. Investment Accelerator, reduce regulatory hurdles to semiconductor ecosystem facility build-outs, and ensure the industry has reliable and sufficient access to critical inputs (such as energy and equipment), expertise, and labor. The process of expanding domestic production is neither simple nor quick. It requires, among other things, complex re-optimization, significant capital investments, concerted, long-term efforts to spur workforce development and retention, and prolonged equipment qualification periods. As an example, the most advanced photolithography equipment used by chip manufacturers around the world took multiple decades of R&D, investment, test runs, and manufacturing to ultimately be used to manufacture today's most advanced chips.

To prevent inadvertently harming the viability and competitiveness of the domestic industry and thereby undermining U.S. economic and national security interests, any measures contemplated in response to the Section 232 Investigation must account for the complexity of this industry, its supply chain, and the significant practical challenges to expanding semiconductor and SME production capacity in the near term. We elaborate on some of the most significant challenges below, which could be exacerbated rather than mitigated by the imposition of broad-based tariffs or import restrictions.

Challenge 1: The cost of building fabrication facilities in the United States is high.

The estimated cost of building a state-of-the-art fabrication facility in the United States is \$15-\$20 billion depending on the semiconductor being produced, which is akin to an aircraft carrier or nuclear power plant, and takes at least 36 months to complete.¹¹ Operating expenses can amount to several billion USD per year. These figures do not include the rising costs of key building components such as steel and aluminum, nor does it full adopt costs driven by permitting and other regulatory requirements. Companies do their best to anticipate demand growth years in advance and to avoid having unused production lines, acknowledging that capital expenditures are both costly and risky,

Challenge 2: Certain SME, chemicals, gases, and materials and other inputs must be obtained from trusted supply chain partners outside the United States.

In the SME market, companies worldwide have developed specialized technologies and supply networks over decades, contributing unique strengths to the industry. It is not practical to fulfill domestic demand solely through domestic production. Each supplier's products are distinguished by proprietary technology and expertise, tailored to specific requirements of device manufacturers. Additionally, semiconductor manufacturers perform comprehensive optimization, considering interactions of various materials and equipment during process development. Thus, establishing new capacity, particularly for advanced manufacturing, necessitates substantial time, resources, and coordination.

The production of SME also requires suppliers for SME parts and components. The majority of these supplies are obtained from outside the U.S. These suppliers include small and medium enterprises, which have limited capacity to relocate their manufacturing operations to the U.S.

Furthermore, semiconductor manufacturing often requires a steady supply of more than 100 chemicals, gases, raw materials, and other inputs over the course of weeks or months. As demand for semiconductors of various types increases, the demand for these inputs is expected to more than triple by 2030, growing to approximately \$13 billion from \$4 billion today (\$3 billion from domestic supply and \$1 billion imported).

The inability to obtain any of these inputs due to the absence of domestic alternatives can significantly disrupt the production process or rapidly drive up the cost of production.¹² Moreover, many of the chemicals used in fabrication require an ultrahigh level of purity, sometimes measured in parts per trillion, requiring the expertise of highly specialized foreign suppliers. While domestic production for some of these chemicals is showing promise for the semiconductor industry and

¹¹ Richard Elkus Jr., *A Strategy for The United States to Regain its Position in Semiconductor Manufacturing* (Feb. 13, 2024), <https://www.csis.org/analysis/strategy-united-states-regain-its-position-semiconductor-manufacturing>.

¹² Chris Musso, Guttorm Aase, and Mark Patel, Creating a thriving chemical semiconductor supply chain in America (Mar. 25, 2025), https://www.mckinsey.com/industries/chemicals/our-insights/creating-a-thriving-chemical-semiconductor-supply-chain-in-america#.

other critical sectors, recent estimates indicate that 60 percent of the inputs required for semiconductor fabrication must be obtained from suppliers outside the United States.¹³

The domestic industry's inability to meet its own demand for many of these critical chemicals and inputs is often due to one or more of the following reasons:

- Extracting, refining, or purifying the necessary chemicals is economically or financially infeasible for domestic companies given the economies of scale already achieved by foreign suppliers,
- The raw materials or resources that must be processed, refined, or purified do not exist in the United States, or are not of sufficient quantity for commercial viability,
- Companies within the United States do not have access to the technology to refine or purify a chemical (even if the raw materials are available), or
- Local environmental or public health regulations restrict the production or processing of certain required chemicals or inputs.

An additional key material or input for consideration is photomasks. The photomask industry is highly integrated among the United States and several of its allies. Tariffs applied to the manufacturing material inputs for photomasks as a result of the ongoing Section 232 investigation, combined with existing tariffs on equipment, are likely to significantly increase costs and reduce total net revenue by up to 30% for U.S. mask producers. Increased costs risk further stymying the growth of U.S. photomask manufacturers, and related downstream semiconductor production rather than incentivizing further growth and onshoring. Photomask materials include photoblanks and pellicles. Photoblanks and pellicles are mostly imported for use in U.S. photomask production.

To be sure, the domestic industry has made progress in increasing its ability to obtain and produce certain of these inputs. Still, given the specialized nature of these inputs, the domestic industry cannot replicate their availability within U.S. borders without major disruptions and rapidly increased costs.

For this reason, SEMI members urge the Administration not to impose untargeted tariffs that risk undermining the domestic industry's access to critical inputs. Untargeted tariffs imposed on certain semiconductors, SME, or derivative products could impede the domestic industry's access to these inputs or lead to spiking costs, which would harm competitiveness and impede the domestic industry's development. To the extent that, following the Section 232 Investigation, the Department of Commerce concludes that tariffs or quotas are necessary, SEMI members urge the Department of Commerce to ensure these measures are narrowly tailored, account for supply chain realities, and avoid as appropriate applying tariffs on any inputs or materials whose supply is critical to domestic fabrication.

¹³ *Id.*

Challenge 3: Developing an adequate workforce

The U.S. semiconductor industry faces a severe, acute talent shortage, due to a shortage of workers with expertise in STEM fields. Based on the projected workforce needs and given the current degree completion rates, an estimated 80 percent of projected new technical jobs risk going unfilled.¹⁴ Imposing untargeted tariffs would threaten to raise costs and decrease U.S. competitiveness, but would do nothing to address the glaring talent gap impacting the domestic industry, which, in our view, requires a more comprehensive, long-term strategy, substantial investments, and consultation with education leaders and the private sector.

Retaining foreign-born personnel trained in the United States in particular should be part of this strategy given the skills, background, and training received by foreign-born students at U.S. colleges and universities. An estimated 50 percent of master's engineering graduates and over 60 percent of PhD engineering graduates are foreign citizens. But among foreign students who graduate from a U.S. institution, approximately 80 percent of master's and 25 percent of PhD STEM graduates do not remain in the United States after graduating, either by choice or because of immigration restrictions.¹⁵

D. Concerns and Recommendations

Given the state and unique characteristics of the global semiconductor and SME supply chain, it is critical that the Department of Commerce, in undertaking this Section 232 Investigation, understand the potential risks and inadvertent harm that would be created by untargeted or non-strategic policy measures like tariffs and import quotas.

Specifically, sweeping tariffs or quotas on imported semiconductors, SME, or other inputs would:

- Undermine efforts to expand U.S. semiconductor manufacturing capacity,
- Increase production costs for U.S. manufacturers
- Reduce R&D investments by squeezing already-narrow profit margins,
- Slow the pace of innovation,
- Raise consumer prices across a wide range of industries, and
- Risk retaliatory actions from trade partners, limiting U.S. companies' access to global markets.

¹⁴ SIA, *Chipping Away: Assessing And Addressing The Labor Market Gap Facing The U.S. Semiconductor Industry* (Apr. 2023), https://www.semiconductors.org/wp-content/uploads/2023/07/SIA_July2023_ChippingAway_website.pdf.

¹⁵ BCG, SIA, *Emerging Resilience in the Semiconductor Supply Chain* (2024), https://www.semiconductors.org/wp-content/uploads/2024/05/Report_Emerging-Resilience-in-the-Semiconductor-Supply-Chain.pdf.

According to publicly reported internal sales data, tariff impacts on products from one leading SME supplier alone could total \$325–\$350 million annually—costs that would ultimately burden U.S. manufacturers and consumers.¹⁶

It is vitally important to note that these effects are not limited to the commercial space. This notice is grounded in the authority of Section 232, which focuses on safeguarding national security. Paradoxically, a sweeping tariff strategy would ultimately diminish the United States' national security posture and capabilities.

Semiconductors are essential to virtually every modern defense and intelligence system. A wide array of chips—including logic, memory, analog, and both advanced and legacy nodes—are embedded across all five domains of military engagement. These components also underpin the civilian systems that support defense infrastructure. Semiconductors are the linchpin for the synchronization and execution of operations across air, land, sea, space, and cyberspace.

Implementing tariffs throughout the semiconductor ecosystem would have a detrimental effect on national security by driving up costs, causing shortages, slowing innovation, weakening the domestic industrial base, and putting pressure on strategic alliances.

- **Supply Shortages and Chain Instability:** Global semiconductor manufacturing relies on an intricate and interconnected network. Tariffs risk disrupting this equilibrium, creating immediate shortages in essential materials and parts. These disruptions would extend beyond the military, affecting critical infrastructure, healthcare technologies, and other vital civilian systems.
- **Rising Costs and Innovation Slowdown:** Increased expenses from tariffs would compel U.S. firms to reduce investment in research and development. This redirection of resources undermines America's competitive edge and hampers progress in cutting-edge technologies vital for defense and commercial leadership.
- **Diminished Domestic Manufacturing Base:** National security agencies have long advocated for strengthening the domestic production capacity of semiconductors. However, broad-based tariffs would counteract these efforts, impeding current initiatives aimed at reinforcing and expanding U.S. capabilities in microelectronics.
- **Strained International Relationships:** Imposing tariffs could provoke retaliatory actions from critical trade partners, including nations that are integral to the semiconductor supply chain. This could lead to fragmented global cooperation and reduce the United States' ability to shape international technology standards.

U.S. defense and intelligence operations rely on access to advanced computing systems, missile defense platforms, cyber defense tools, secure communication networks, and both terrestrial and space-based infrastructure, to name only a few examples. Tariffs that constrain the

¹⁶ <https://www.reuters.com/technology/us-tariffs-may-cost-chip-equipment-makers-more-than-1-billion-industry-estimates-2025-04-15/>

semiconductor supply and raise the cost of production tools will delay modernization, impair operational readiness, and weaken the technological superiority the U.S. has long relied upon.

E. Recommendations

Rather than relying on tariffs or import quotas, SEMI members urge the Trump Administration to undertake the following measures, each of which they believe would be far more effective in addressing these economic and national security concerns:

- **Strengthen ties with trusted trading partners and geopolitical allies.** The semiconductor industry's success is built on decades of global specialization, along with technological collaboration and partnership. Each supplier brings differentiated products, tailored specifications, and unique expertise. Duplicating this intricate network within U.S. borders would entail astronomical costs and years of delay—outweighing the theoretical benefits of reduced import reliance. Moreover, it would siphon critical resources away from R&D investments, slowing innovation and jeopardizing America's technological leadership. Strengthening ties with trusted partners and allies will be critical to bolstering supply chain resilience while maintaining U.S. innovation leadership.
- **Build on recent, successful incentive strategies that have driven rapid increases in investment in the domestic industry.** This can be done through the Trump Administration's U.S. Investment Accelerator, which itself has improved upon the CHIPS Act and delivered significant results. Additional policies that incentivize investments, provide targeted subsidies for critical capacities, reduce regulatory burdens, and create more opportunities for public-private partnerships would attract additional investment critical for building out domestic production capacity. Additionally, the expansion of the advanced manufacturing investment tax credit (ITC) beyond its 2026 expiration will be critically important in protecting existing U.S. semiconductor manufacturing investments and encouraging future investments.
- **Establish a national semiconductor workforce development strategy.** This strategy should involve helping local community and technical colleges grow the talent pipeline, attracting more students to STEM fields, and attracting and retaining the most talented international advanced degree students.

If trade remedies are deemed necessary, SEMI members believe the following would mitigate the potential risks of harming the domestic industry:

- Undertaking gradual, targeted implementation to allow adjustment without widespread disruption.
- Avoiding the application of tariffs for imports originating from trusted allied countries.
- Ensuring that tariffs do not apply to semiconductor materials, given that these materials are critical to domestic production.

III. CONCLUSION

The Section 232 Investigation presents a pivotal opportunity to reinforce the security and competitiveness of the U.S. semiconductor industry. Achieving this goal demands a balanced, forward-looking strategy that:

- Fosters domestic investment,
- Strengthens international partnerships,
- Prioritizes innovation and workforce preparedness, and
- Avoids inadvertently undermining the industry it is seeking to bolster.

This approach recognizes the complexity of semiconductor supply chains and allows companies time to adapt, thereby mitigating both compliance challenges and financial burdens. SEMI brings a uniquely deep understanding of these complexities, as we directly represent the companies at the heart of the semiconductor and SME ecosystem—providing insight unmatched by most other industry associations. SEMI stands ready to work with the Trump Administration to advance policies that increase the resilience of the U.S. semiconductor and SME supply chain while safeguarding the global supply chains that have made its leadership and continued development possible.