SEMICONDUCTOR INDUSTRY ASSOCIATION

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The Semiconductor Industry Association (SIA) applauds the Biden Administration's decision to develop an Indo-Pacific Economic Framework (IPEF) in collaboration with U.S. allies and trading partners in the Asia-Pacific region in order to expand U.S. exports and jobs, deepen regional economic relations, and strengthen regional cooperation in critical technologies, digital issues, and supply chains.

We are submitting in response to requests by the U.S. Department of Commerce[1] (DOC) and the Office of the U.S. Trade Representative[2] (USTR) for public comments on IPEF's pillars on (1) fair and resilient trade, (2) supply chain resiliency, (3) clean energy, decarbonization, and infrastructure, and (4) taxation and anti-corruption. Strong U.S. leadership in advancing a forward-looking economic agenda in the Indo-Pacific is critical to strengthening U.S. supply chains; advancing U.S. economic, trade, and strategic interests; and maintaining and strengthening U.S. leadership in the global semiconductor marketplace.

As has become increasingly clear, existing global trade rules are insufficient or ineffective at combatting discriminatory and market-distorting practices in the ICT sector. Current global trade tensions underscore the importance of establishing more robust global trade disciplines that protect and strengthen the U.S. semiconductor industry and the broader global digital economy and expand access to some of the world's fastest-growing markets. We urge the Administration to prioritize these and other strong digital trade outcomes in the IPEF to counter growing regional restrictions on U.S. trade, address the growing influence of state capitalism, and reassert U.S. economic leadership in regional trade rule-making.

[1] U.S. Department of Commerce, Requests for Comments on the Indo-Pacific Economic Framework, Federal Register, Vol. 87, No. 48, p. 13971 (March 11, 2022)

[2] Office of the U.S. Trade Representative, Requests for Comments on the Proposed Fair and Resilient Trade Pillar of the Indo-Pacific Economic Framework, Federal Register, Vol. 87, No. 47, p. 13789 (March 10, 2022)

I. Introduction

SIA is the voice of the semiconductor industry, one of America's top export industries and a key driver of our Nation's economic strength, national security, and global competitiveness. Our members are global leaders in semiconductor manufacturing, design, and research, and account for 98% of U.S. semiconductor firms by revenue. Semiconductors – the tiny chips that enable modern technologies – power incredible products and services that have transformed our lives and our economy, powering hundreds of thousands of manufacturing and technology jobs and virtually everything digital from cellphones and cards to supercomputers and military systems.

We are, moreover, a uniquely American success story. Semiconductors were invented in the United States. Nearly half of the manufacturing operations of the leading U.S. semiconductor firms are located in the United States. These operations are spread across 18 U.S. states, directly employing 277,000 people in highly-skilled, good-paying jobs and supporting an additional 1.6 million jobs throughout the U.S. economy. Today, semiconductors are America's 4th largest export with more than $49 billion exports in 2020. Over 80% of U.S. semiconductor sales are to overseas customers.

II. Strengthening U.S. Leadership in Advanced Semiconductor Technologies and Manufacturing

As an exporting powerhouse, our industry relies on a complex and global supply chain for all aspects of the supply chain from raw materials, equipment, R&D, design, manufacturing, technology, human talent, testing, and distribution. The intermediate nature of our products also requires the import and re-export of products (both in tangible and intangible forms) to meet the constantly changing needs of our customers, power the US economy, and produce the world's most advanced chips. These factors, combined with the high-capital costs and short product-life cycles of our cutting-edge technologies, mean our industry's success and competitive edge depends on the ability to move semiconductors freely, efficiently, fairly, and quickly across borders. In 2019, a Boston Consulting Group study found that semiconductors were the fourth most traded good on the planet, with nearly $1.9 trillion in total semiconductor trade.

The importance of the Indo-Pacific region, which accounts for 60% of global GDP and more than one-third of global goods trade, for U.S. semiconductor manufacturing and supply chains cannot be overstated. In 2021, U.S. exports of semiconductors to the Indo-Pacific region accounted for 26% of total U.S. semiconductor exports to the world ($15 Billion), and a whopping $90 billion in sales.

Key Asia-Pacific economies, such as South Korea, Japan, Chinese Taipei, Singapore, Malaysia, Vietnam, and the Philippines, are vital links in the global semiconductor supply chain and it is critically important they be part of IPEF at the outset. As we look ahead, over half of global growth is projected to come from the Asia-Pacific between 2019 and 2050. An IPEF that embraces key parts of the industry's global supply chains, and with meaningful, binding rules and commitments

and reduced tariffs and other barriers, would enhance access to growing global markets in Asia and sustain the US leadership in the semiconductor industry. Specifically, the U.S. should negotiate the highest-standard digital trade provisions with an initial group of like-minded negotiating partners, including Australia, Japan, New Zealand and Singapore, that are prepared to meet such standards. The final IPEF should include an open architecture allowing other Indo-Pacific countries to join if they commit to the agreement's high standards. This is particularly important if Congress, as expected, shortly approves funding for the CHIPS and FAB Acts to support U.S. semiconductor research and development, design, and manufacturing, since the industry will need expanded export markets to sell U.S. chips and semiconductor-intensive products (e.g. ICT technology, medical devices, AI, electric vehicles, environmental, climate, etc.)

Accordingly, SIA strongly encourages the Administration to prioritize negotiating objectives that facilitate expanded access to global markets, strengthen supply chains, strengthen and expand digital trade disciplines, and promote fair, market-based competition. We offer below proposed semiconductor-specific negotiating objectives for the IPEF, including priorities aimed at supply chain resilience, export controls, digital trade, state-owned enterprises (SOEs), trade-related intellectual property rights (IPR), and other challenges that face the U.S. semiconductor industry.

III. U.S. Semiconductors – Complex Global Supply Chain

In 2020, the world experienced a once-in-a century COVID-19 pandemic that throttled supply and created unanticipated swings in semiconductor demand. While some downstream sectors initially reduced production and chip purchases, others saw soaring demand for semiconductors to maintain critical functions and support remote working and virtual primary, secondary, and university education during worldwide lockdowns. Underlying this dynamic, massive dislocations in global logistics and transportation networks coupled with shortages of raw materials, key components, and intermediary products exposed extensive vulnerabilities in highly interdependent and globalized value chains.

While chipmakers are working around the clock to ramp up production by every possible means in the short-term - and producing semiconductors well-above pre-pandemic levels – IPEF represents an important opportunity to further improve supply chain resiliency and diversity. This requires a holistic approach with consideration for each step of a highly complex and globalized supply chain. Depending on the type of end user, semiconductor devices can travel through an intricate chain of distributors, raw material and component suppliers, assembly suppliers, distributors, and other steps.

The current shortages, moreover, are rooted in precipitous and fundamental changes to market demand. Demand for chips is increasing across the board and capacity must expand worldwide, including in the U.S., to meet present and future needs as semiconductors continue to drive advances in cutting-edge technologies such as AI, 5G, ICT, and electric vehicles, and as our tiny chips are increasingly incorporated in traditional industrial products such as motor vehicles, appliances, environmental, power, and HVAC systems. Strengthening regional semiconductor

supply chains and boosting resiliency and diversification therefore requires a long-term, comprehensive, and holistic approach aimed at bolstering the entire global semiconductor ecosystem, minimizing the risk of future disruptions, and securing continued U.S. leadership in technological innovation and manufacturing capacity in partnership and coordination with our allies.

Fabrication of semiconductors typically requires as many as 300 different inputs, including raw wafers, commodity chemicals, specialty chemicals, sputtering targets and bulk gases. Many of them also require advanced technology to produce. Semiconductor manufacturing itself uses more than 50 different types of sophisticated wafer processing and testing equipment provided by specialist vendors for each step in the fabrication process. Most of this equipment, such as lithography and metrology tools, incorporates hundreds of technology subsystems such as modules, lasers, mechatronics, control chips, and optics. The highly specialized suppliers involved in semiconductor design and fabrication are often based in different countries, including the Asia-Pacific.

Modern fabs use advanced automation and process control systems for direct equipment control, automated material transportation and real-time lot dispatching, with many of the newest facilities almost entirely automated. Semiconductor manufacturing equipment also incorporates many subsystems and components with specific functionality, such as optical or vacuum subsystems, gas and fluid management, thermal management or wafer handling provided by hundreds of specialized suppliers. Developing and fabricating such advanced, high-precision manufacturing equipment requires massive investments in R&D. Semiconductor manufacturing equipment companies typically invest 10% to 15% of their revenues in R&D.

In recent decades, companies have evolved into different manufacturing models. Integrated Device Manufacturers (IDMs) are vertically integrated across multiple parts of the value chain, performing design; fabrication; and assembly, packaging and test activities in-house. IDMs accounted for approximately 70% of global semiconductor sales in 2019.

In the early decades of the industry, the IDM model was predominant, but the rapidly increasing size of the investments in both R&D and capital expenditure created the need for both scale and specialization, and has led to the emergence of the fabless-foundry model. In practice, most IDMs have evolved into hybrid "fab-lite" models where they outsource some of their production and assembly.

As the industry moves to small technology nodes, development costs have continued to rise. With escalating costs at cutting edge nodes, more and more companies, including IDMs, have moved to "fab-less" models, relying instead on foundries for leading edge fabrication. A fab-less semiconductor company typically specializes in research, development, and design, and farms out the actual manufacturing of its designs to foundries. Foundries therefore address the fabrication needs of design and other fabless firms and IDMs alike, as most IDMs do not have sufficient installed manufacturing capacity in-house to cover all their needs.

This business model enables foundries to diversify the risk associated with the large upfront capital expenditure required to build modern fabs across a larger customer footprint of fabless design firms and IDMs. Most foundries are focused purely on manufacturing for third parties, which in turn, allows design firms and IDMs to focus on investing in cutting-edge research and development, without being concerned over potential technology leakage to competitors Leaving memory aside, foundries have added 60% of the incremental capacity in the industry for DAO and logic products during the past five years. Currently foundries account for 35% of the total industry manufacturing capacity, or 50% if memory is excluded (a segment of the industry whose economics do not justify outsourced manufacturing). Their share rises to 78% in advanced (14 nanometers or below) and trailing nodes (20 to 60 nanometers) using the more advanced 12"/300mm wafer size.

The semiconductor industry is investing heavily into capacity-building to meet future demand and enhance supply chain resiliency. In 2020, total U.S. semiconductor industry investment in R&D alone totaled $44 billion. The industry annually directs roughly one-fifth of its revenues back into R&D.

IV. SIA Recommendations

1. EXPANDING FAIR AND RESILIENT TRADE

The funding for the CHIPS and FABS Acts currently pending before Congress aims to dramatically expand U.S. semiconductor manufacturing capacity and supply chain resiliency. As the U.S. expands its manufacturing capacity, it is vital to continue the decades-long efforts by USTR and Commerce to expand markets for U.S.-built semiconductors and semiconductor-intensive U.S. technology and industrial products, so these products have a place to go.

The logical place is the Indo-Pacific region, which accounted for 26% of total U.S. semiconductor exports to the world in 2021 ($15 Billion), and supported a massive $90 billion in sales. As we look ahead, over half of global growth is projected to come from the Asia-Pacific from 2019 to 2050. An IPEF with meaningful, binding rules and commitments and reduced tariffs and other barriers to U.S. semiconductors would enhance U.S. access to the growing global markets in Asia for U.S.-built semiconductors and semiconductor-intensive industrial products, and sustain the US leadership and jobs in this vital technology. This is particularly important if the U.S. remains outside regional free trade agreements like CPTPP and RCEP, since these provide preferential access to chips, technologies, and industrial products from other FTA participants, including China, Korea, Japan, and ASEAN.

The majority of semiconductor demand is driven by products ultimately purchased by consumers, including laptops and communication devices such as smartphones, although chips are being increasingly incorporated in traditional industrial products (e.g., autos, appliances, medical devices, industrial machinery, televisions, kitchen appliances, HVAC systems, etc. Eighty percent of the chips industry's consumers are overseas and increasingly, consumer demand is being driven by emerging markets including those in Asia, Latin America, Eastern Europe, and Africa. Since the

turn of the century, the Asia Pacific market has surpassed all other regional markets in sales of semiconductors, as consumer electronics and ICT production shifted to the region. As a result from 2001-2020, the Asia Pacific market has since grown exponentially from $39.8 billion to over $271 billion in 2020.

It is vital that IPEF incorporate economies that are key parts of the semiconductor supply chain, such as South Korea, Japan, Chinese Taipei, Singapore, Malaysia, Vietnam, and the Philippines. All are important links in the global semiconductor supply chain and their exclusion would carry costs and invite disruption. Similarly, while we understand the IPEF is focused on U.S. engagement in Asia, it should also be viewed as an opportunity to encourage greater trade and investment from key Indo-Pacific partners. Thus, we encourage the United States to continue to implement domestic policies that treat foreign direct investment from key Indo-Pacific partners in an open, transparent, and non-discriminatory way.

In addition, we welcome the Department's assurances that IPEF membership will not remain static. The is important as semiconductor supply chains evolve as to improve resiliency and diversity. Finally, IPEF should remain open to new members if countries that are initially outside the Framework evolve to adopt market-oriented reforms and embrace democracy and the rule of law.

2. STRENGTHEN SUPPLY CHAIN RESILIENCE

The COVID-19 pandemic and the ongoing global chip shortage have further highlighted the significance of semiconductor supply chain resilience to today's economy. With deep global supply chains, the US semiconductor industry shares similar supply chain interests and concerns with our Indo-Pacific partners. IPEF participants should commit to working together to strengthen our collective supply chain resiliency, including through coordination and exchange of information on government policies and incentives policies related to semiconductors, with an aim to not undercut each other or create market-distortions. Key objectives of any policy should be to diversify production and design capabilities across legacy, intermediatory, and leading-edge nodes while avoiding supply disruptions.

3. STRENGTHEN SAFEGUARDS AND INCREASE PENALTIES TO PROTECT TRADE SECRETS & OTHER IP

One of the most effective means of spurring the development of new technologies continues to be creating incentives for innovators to invest in long-term R&D. As such, stronger support for intellectual property rights should be built into any potential framework, particularly trade secrets.

The most problematic form of trade secret theft is misappropriation that is enabled or encouraged as the result of governmental industrial policy. Trade secrets in our industry include manufacturing know-how, chemical formulations, chip designs, and other proprietary information. They are a critical and major asset of U.S. semiconductor companies. Yet despite their tremendous

importance, trade secrets remain extremely vulnerable, especially in Indo-Pacific jurisdictions with weak laws and/or enforcement practices.

Therefore, the IPEF should require criminal penalties for trade secret theft, including theft by governments or theft by means of cyber intrusion, and strengthened procedures to protect trade secrets during conformity assessment procedures, such as banning forced disclosure of software source code, encryption, or other sensitive IP in certification/regulatory schemes. The IPEF should also encourage capacity building and information sharing for law enforcement, counter-intelligence, and judicial branch activities related to semiconductor IP and trade secrets protection.

4. ELIMINATE DUTIES ON SEMICONDUCTOR-INTENSIVE PRODUCTS, ELECTRONIC TRANSMISSIONS

The U.S. has long eliminated duties on most ICT products and electronic transmissions through our participation in WTO agreements like the Information Technology Agreement (ITA), WTO Moratorium on customs duties on electronic transmissions, Uruguay Round Agreements, and FTAs. This duty-free treatment for both tangible and intangible ICT goods has helped ensure the free flow of ICT and digital products across borders, to the benefit of U.S. goods and services exporters of all sizes. The U.S. benefits disproportionately from tariff elimination, since our duties on most products are extremely low, whereas many of our trading partners in the Asia-Pacific retain much higher tariffs.

Moreover, some Indo-Pacific governments are leading the opposition to extension of the WTO e-commerce moratorium which bans customs duties on electronic transmissions. This ban has been in effect on a rolling two-year basis since 1998 and has been regularly extended by WTO Ministers at their biannual meetings. In view of the efforts by some governments to let the moratorium expire and establish duty/tariff mechanisms for data flows, the U.S. should pursue commitments from IPEF participants to establish a clear, unified position supporting duty-free treatment for digital goods (i.e. apps, eBooks, music), including a permanent commitment to: (i) not impose customs duties or fees on trade in electronic transmissions and digital products in the IPEF; and (ii) jointly promote that ban to other governments.

5. ENSURE GLOBAL MARKET ACCESS FOR THE MOST INNOVATIVE & EFFECTIVE ENCRYPTION PRODUCTS

The IPEF should prevent countries from taking actions that block or place discriminatory restrictions on commercial foreign products with encryption, or that block companies from using the strongest available security technologies in the marketplace. Encryption, enabled by and used in semiconductors, is now used in nearly all commonly used and globally traded ICT products to protect information and secure data transfer. The adoption of restrictive policies, such as import bans, technology mandates or requirements to transfer or provide access to proprietary information, could threaten the large trade flows of semiconductors and other ICT products on the scale of hundreds of billions of dollars.

6. ENSURE THAT SOEs COMPETE BASED ON FAIR AND TRANSPARENT MARKET CONDITIONS

The U.S. semiconductor industry has a long history of battling the effects of market and trade distortions caused by foreign government subsidies, interventions, discriminatory investment requirements, and other non-competitive behavior. In their most extreme examples, these policies advantage SOEs and national champions. The IPEF should include rules to ensure that SOEs make decisions on the basis of commercial considerations and do not discriminate against foreign companies, including: i) banning specified "performance requirements," including local content requirements, export requirements, and technology transfer or technology localization requirements; ii) requiring regulatory bodies to regulate in an impartial manner and not use their regulatory authority to provide preferential treatment to their SOEs, and (iii) prohibiting discriminatory government policies that favor local SOEs.

As in TPP-12, IPEF should include commitments by the Parties to ensure that their SOEs make commercial purchases and sales solely on the basis of commercial considerations and cannot discriminate against the enterprises, goods, and services of other Parties. It should include rules requiring Parties to ensure that courts and administrative bodies regulating SOEs and private companies do so in an impartial manner and do not use their regulatory authority to provide preferential treatment to their SOEs or limit their liability for trade secret theft or other practices. As discussed below, the parties should agree to rules to prevent trade- and market-distorting forms of government support. Finally, IPEF should require Parties to ensure transparency, including notifying their SOEs to other IPEF Members and providing annual notifications about the extent of government ownership or control and the extent of financial and other support they provide to SOEs.

The SOE rules should be drafted so as to ensure that if certain large economies with abundant SOEs ever join IPEF down the road, they will become subject to binding and effective disciplines. While we recognize these economies are unlikely to be part of the initial IPEF agreement, the U.S. should lay the groundwork for imposing strengthened regional SOE disciplines if things should ever change.

7. PREVENT FORCED LOCALIZATION OF DIGITAL INFRASTRUCTURE & TECHNOLOGY TRANSFER & LOCAL CONTENT REQUIREMENTS

Governments are increasingly adopting rules on "forced localization" to advantage domestic companies and/or force foreign investors to use domestic technology, transfer their own technology, localize data storage and processing, or build expensive infrastructure in a region as a condition of market access, often adding unnecessary costs and burdens on providers and customers alike. SIA applauds the strong digital trade outcomes incorporated in the USMCA to counter these measures and encourages the Administration to prioritize similar disciplines in the IPEF to protect and strengthen digital trade. Among the provisions to be included would be: free flow of data across borders; prohibition on localization requirements for computing facilities; and,

a ban on requirements to turn over one's source code, algorithms, or related IPR. These provisions would promote innovation and economic growth while ensuring that U.S. products and services, which are among the most competitive in the world, are treated fairly in foreign markets.

8. SIMPLIFY AND HARMONIZE CUSTOMS AND TRADE PROCEDURES

The semiconductor value chain and supporting activities comprising the semiconductor ecosystem (i.e. raw materials, manufacturing equipment, research, design, fabrication, assembly, packaging and testing, distribution) is spread across the globe involving more than 100 countries. Simplifying and making more consistent customs procedures around the world will speed up time-to-market, lower costs, and lighten the regulatory burden of semiconductor companies with complex and global supply chains. We urge the IPEF to include strong rules to support trade facilitation, expedite customs procedures, prevent arbitrary penalties and delays, and include mutual recognition procedures for authorized economic operators (AEOs). These should be developed in consultation with industry.

9. STRONG DISCIPLINES OVER SEMICONDUCTOR EQUITY INVESTMENTS

An issue of heightened concern is a massive expansion of equity investments by certain large Asia-Pacific economies. While these economies are unlikely to be part of the initial IPEF agreement, the U.S. should lay the groundwork for imposing strengthened regional disciplines over trade-distorting equity investments if they should ever join, implementing the Obama Administration's original vision for TPP-12. In short:

i. Semiconductor equity investments by governments and public bodies should be consistent with WTO rules, transparent and non-discriminatory, market-based, and structured to avoid distorting global and domestic trade, markets, and investment.

ii. Semiconductor equity investments by governments and public bodies should accord with the normal operation of market forces and should not lead to injections of capital into firms, projects, or facilities that are (1) failing or bankrupt, or (2) would not be deemed worthy of private sector equity investment given normal expected market levels of return.

iii. In accordance with existing WTO disciplines, IPEF members should promptly notify IPEF on an annual basis of all semiconductor-related support, including equity investments or infusions, that are subject to the WTO notification requirements as specified in Article 25 of the WTO Subsidies and Countervailing Measures Agreement ("SCM Agreement").

ii. Transparency - Such transparency shall include the extent to which an IPEF government owns shares in a semiconductor entity, the ownership structure of such entity,

and relevant information to enable IPEF members to accurately assess its current and future market effects, including size of investment, targeted products, and current and future capacity.

iv. Market-Based Rate-of-Return – To ensure that competitive outcomes are determined by the market, semiconductor entities benefiting from government equity investments or infusions should be subject to minimum expected rate-of-return requirements, so as to ensure that government investments are consistent with what a comparable private sector investor would do in similar circumstances over the life of the investment under market-based conditions and involve significant levels (50% or more) of private sector participation.

v. Time-Limited - Government equity investments or infusions in semiconductors shall be time-limited and phased out when an enterprise (1) transitions from basic research and development to commercial activities, (2) has sufficient access to private capital and no longer needs government support, or (3) has benefited from a government equity investment or infusion for a maximum period of 15 years.

vi. Coverage of Public Bodies - The IPEF rules should cover subsidies as defined in the WTO SCM Agreement, including any provision of semiconductor-related equity whether from a central or local government or authority, or entity over which the government exercises control, direction, or substantial influence."

vii. Santiago Principles - Finally, the IPEF should incorporate Santiago Principles regarding the management of sovereign wealth funds in order to ensure transparency and minimize trade and market distortions.

10. HARMONIZE AND MULTILATERALIZE TARGETED EXPORT CONTROLS TO ACHIEVE A FAIR AND COMPETITIVE MARKET

IPEF participants should work together to align on a multilateral approach to ensure export controls are (1) effective, (2) narrowly focused on technologies that pose direct and tangible national security risks, (3) avoid inadvertent damage to American industry, and (4) do not cause disproportionate or unintended harm to the industrial base of the U.S. and its allies. Multilateral approaches that harmonize the scope, application, and enforcement of export controls among IPEF participants remove unnecessary burdens, enhance compliance, and enable a fair and competitive market for all parties. They are also effective. In contrast, unilateral U.S. export controls achieve little in terms of advancing U.S. national security if alternative sources of supply from our allies or trading partners are readily available. Collaborative regional efforts should seek clarification and agreement on the application and interpretation of IPEF countries' licensing policies, definitions of common terms, and strategic-level policy objectives, among other means to enhance convergence.

V. Conclusion

The Semiconductor Industry Association (SIA) applauds the Biden Administration's decision to develop an Indo-Pacific Economic Framework (IPEF) in collaboration with U.S. allies and trading partners in the Asia-Pacific region to deepen economic relations and cooperation in critical technologies, digital issues, and supply chains. Existing global trade rules are plainly insufficient or ineffective at combatting discriminatory and market-distorting practices in the ICT sector. Current global trade tensions underscore the importance of establishing more robust regional trade disciplines that protect and strengthen the U.S. semiconductor industry and the broader global digital economy and expand U.S. access to some of the world's fastest-growing markets. We urge the Administration to prioritize these and other strong digital trade outcomes in the IPEF to counter growing restrictions on U.S. trade and reassert U.S. economic leadership in regional trade rule-making. We look forward to working closely with Commerce and USTR to secure an IPEF that brings the Asia-Pacific's key economies together around a strong set of binding and enforceable rules that advances free and fair trade, expands U.S. exports, and boosts America's supply chain resiliency.

Respectfully submitted,

s/ Jimmy Goodrich

Jimmy Goodrich

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