The publication of the European Chips Act in February 2022 is a tremendous opportunity for the European Union to support and secure the broad semiconductor supply chain and its resiliency, advance European technological leadership and boost the digital transformation of our economies and societies. This document contains key principles and recommendations for the European Commission and European legislators in the European Parliament and Council of the EU to ensure that the European Chips Act proposal holistically addresses the key issues facing the semiconductors industry at all levels across the supply chain, including supply chain security, manufacturing, research and development, skills and workforce issues as well as necessary cooperation with international partners.

The Information Technology Industry Council (ITI) is the premier global advocate for technology, representing the world’s most innovative companies, including companies directly involved in the semiconductor manufacturing and packaging supply chain as well as downstream consumers and users of microelectronics technology. Founded in 1916, ITI is an international trade association with a team of professionals on four continents. We promote public policies and industry standards that advance competition and innovation worldwide. Our diverse membership and expert staff provide policymakers the broadest perspective and thought leadership from technology, hardware, software, services, and related industries.

The COVID-19 pandemic has demonstrated the vital importance of the semiconductor industry, which has enabled key products and services for remote working and remote learning. **Semiconductors represent the foundational building blocks of – and serve as a fundamental enabler of – information and communications technology (ICT) products and services across our industry**, products and services which in turn are integral to driving the digital transformation of our economies and societies. Advances in semiconductor technology contribute to new, world changing technologies like 5G, Internet of Things (IoT); Artificial Intelligence (AI); enhanced cloud services; and quantum computing. Technologies made possible by semiconductors are also fundamental to drive the twin - green and digital - transition and achieve the EU’s climate objectives.

For these reasons, **the tech industry strongly supports the European Commission’s goal to strengthen availability of semiconductor technologies and the resilience of supply chains**. This can be done by directing funding to the whole semiconductor ecosystem from research to manufacturing and by addressing supply chain issues that may affect availability of these foundational technologies including by finding common solutions with global partners.

In order to reap the most benefit from the European Chips Act, we encourage EU legislators to keep the following principles in mind:

1. **Strengthen the EU’s Global Competitiveness in Semiconductors**

Strengthening high-tech manufacturing of semiconductors and bolstering R&D in the EU has the potential to drive innovation across many different sectors for decades to come. It is important that the European Chips Act provides an ambitious framework and set of tools to allow the EU and Member States to incentivise the semiconductor industry. As recognised by the European Commission’s 2021
report on Strategic Capacities and Dependencies, the EU’s competitiveness in the global semiconductors market is harmed by high entry costs, limited existing production capacity to serve future demands and inadequate access to financing. The EU is currently lagging behind other regions, capturing only ~10% of the global revenues for semiconductor chips, against its 23% share of global GDP. For the EU semiconductor industry to remain competitive, and to strengthen the resilience of critical semiconductor supply chains, policymakers should prioritise incentivising research, design, development, prototyping, and manufacturing of semiconductors in the EU. Such investments and incentives are necessary to enable firms to build new or expand existing manufacturing capacity in the EU and increase the EU global competitiveness. Incentivising semiconductor manufacturing and R&D also has the potential to drive innovation across nearly every sector of the economy and is the single most important action to take to strengthen these critical supply chains.

Given the global and interconnected nature of semiconductors supply chains, it is important that funding efforts and other incentives are coordinated with global like-minded partners. Projects to increase domestic manufacturing capacity are costly and time consuming, and the availability of key semiconductor technologies should also be assured via global efforts with key partners to ensure openness and reliability of the supply chains. This is even more crucial given the rapidly increased demand for semiconductor technologies that power the digital economy, the importance of which was highlighted by the recent COVID-19 crisis. It is critical to recognise that a more resilient supply chain does not inherently mean a supply chain that is entirely located inside the European Union. Instead, the COVID-19 pandemic has further demonstrated that resiliency requires the deployment of multiple, ongoing initiatives that provide for coverage in times of uncertainty but do not introduce new requirements that reduce global competitiveness and trade openness.

A related, important factor to this is to ensure protection for companies’ valuable intellectual property integrated in chips, for example by considering protections against circumvention of technological protection measures, to prevent unauthorised access and use of trade secrets or confidential data contained in chips, thereby increasing the economic rationale for state-of-the-art chips design in Europe.

In addition to supporting the increased production of the final semiconductor product, it is critical to ensure that procurement of the unique key raw materials utilised in the production of semiconductors is adequately supported. Components such as sputtering targets and high purity chemicals are key to the supply chain and fundamental for a robust domestic industry. As semiconductor features evolve and pass below 10 nm and use new wafer production technologies, which include cobalt and ruthenium, the EU must strengthen R&D investment to keep pace with other key players in the global stage.

The EU needs to ensure a consistent domestic supply that is sufficiently insulated from external shocks to the supply chain, including unique raw materials. Augmenting domestic production of semiconductors, coupled with ensuring the continuity of necessary global supply chains, would make Europe’s semiconductor supply chains more resilient to future crises.

2. Incentives Should Target the Whole Semiconductor Ecosystem

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2 European Commission, “Strategic Dependencies and Capacities”, 2021, 82
To address long-term supply concerns, and to compete globally in designing and producing increasingly complex state-of-the-art semiconductor components, the EU must invest in the semiconductor ecosystem overall. Funding and incentives should promote semiconductor research, design, packaging, prototyping, and manufacturing – each of which plays a fundamental role in strengthening EU semiconductor supply chain capacity. It is equally important to avoid distorting the semiconductor market by favouring some sectors or applications over others. Policymakers should not interfere in the market allocation of supply, even in the short-term. Picking winners or losers by prioritising certain industries over others would undermine ongoing market efforts to build resilience into supply chains and make it more difficult for companies to adapt to meet market needs.

Market- and demand-based allocation of European Chips Act support should equally apply across semiconductor technologies. While policymakers are rightly focusing their attention on leading-edge semiconductor technologies, there is still a need for manufacturing resiliency of mature nodes. For example, while some semiconductor technologies have migrated to 300mm wafers to support higher-end processing performance, there are a variety of power management integrated circuits (PMICs) and other semiconductors that are still manufactured using 200mm nodes. These older fabs support a variety of mixed signal chipsets still in use today. EU investment in semiconductor manufacturing should take into account demand for these nodes and ensure manufacturing resiliency across the full portfolio of chipsets used today.

3. Funding and Incentives Should be Open to All Companies

The European Commission’s 2030 Digital Compass sets the goal for Europe to provide at least 20% of the world’s production value in semiconductors by 2030. To meet this ambitious target, it is important to make incentives available to the entities best positioned to help the EU accomplish this goal, regardless of where they are headquartered. Funding and incentives under the European Chips Act should be accessible to all multi-national chip manufacturers that meet the agreed upon standards and guidelines, without prioritising domestic players over non-EU companies. Policies intended to promote Europe’s digital economy should remain aligned with Europe’s longstanding commitments to multilateralism and open markets, and not based on the false premise that excluding or otherwise treating foreign entities differently will strengthen Europe’s technological competitiveness. This is critical as only a handful of companies in the world currently manufacture at the leading edge. As pointed out in the recent Kearney report on Europe’s investments in leading-edge semiconductors, in order to reach its goals, the EU should seek to attract foreign investment from the leading firms in the semiconductor industry to establish local manufacturing capacities, which would in turn benefit R&D, develop the local workforce and contribute to the local semiconductor ecosystem.

Innovation brought about by global companies contributes to Europe’s goal of maintaining and increasing the ability to develop key competences and technologies and ensure their availability in the future; it also creates jobs and enhances the competitiveness of the overall European economy. In order for the European Chips Act to be a success, it is thus fundamental that the EU works together

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with the industry to develop a coherent, streamlined and effective long-term approach to address semiconductor supply chain issues in a coordinated and holistic manner.

4. Enhance Cooperation with Global Partners

The goal of securing the semiconductor supply chain cannot be reached by only focusing on growing the domestic chips industry. The semiconductor supply chain – comprised of research, design, advanced development, prototyping, manufacturing, assembly, test, packing, and distribution – is complex and global. For this reason, any policy action aimed at strengthening the resilience of the European supply chain should be coupled with ambitious and detailed plans for cooperation with global partners. The EU should work with like-minded partners and allies such as the U.S., Japan, South Korea, Taiwan, and others to minimise damaging interruptions and ensure stability of the global semiconductor supply chain. Such efforts could include the convening of formal supply chain reviews with allies and building upon existing efforts to ensure that market access barriers do not present impediments to the efficient functioning and resiliency of global supply chains.

Acknowledging the complexity, interconnectedness, and significant investment required to operate global semiconductor supply chains, this kind of engagement should seek to better enable firms to carefully calibrate their supply chains, maximise time-to-market, and account for other considerations that enable them to remain globally competitive. EU policymakers should keep these global competitiveness considerations in mind and coordinate with foreign governments to ensure the stability of the global semiconductor supply chain, including by ensuring alignment on broader strategic objectives.

In this context, the EU should seek to enhance cooperation with the United States in line with the new push for a stronger transatlantic partnership set forth in the new “EU-U.S. Agenda for Global Change.” Recent initiatives in the U.S. – such as the Creating Helpful Incentives to Produce Semiconductors (CHIPS) for America Act - and the EU show comparable and compatible goals to increase the resiliency of the semiconductor supply chains. With deep economic ties between the EU and the U.S., representing almost 50% of global GDP, as well as commitments to shared transatlantic values, there is ample opportunity to align goals and intensify cooperation on semiconductor R&D and manufacturing. This strategic relationship has the potential to bring about significant economic and societal benefits for both the EU and the U.S. In this context, the recently established EU-U.S. Technology and Trade Council (TTC) can be the optimal forum for engaging and finding common solutions to improve resilience. This can be done by implementing coordinated and targeted export control policies and adopting common licensing approaches; and pursuing joint R&D initiatives for critical technologies/components where supply chain shortages, gaps, or cost disadvantages with other regions are identified.

It is also important to consider that global cooperation and diversification are key risk-management measures to improve supply chain resiliency. Today, the semiconductor supply chain is vulnerable to some specific weaknesses as a result of industry consolidation and materials selling to more concentrated groups of customers (chip producers). In this context, diversified production and supply chains are a source of resilience for firms in an adverse environment. Companies with diversified supply chains are better able to adjust to external supply chain shocks to keep production and shipments online. The EU should thus work with external partners to address risks to the supply chain and increase resilience and diversification. Semiconductor companies are facing increasing risks of

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supply chain disruption resulting from geopolitical conflict and trade tensions. Geopolitical risks include unilateral tariffs, non-national-security-based export restrictions, or trade blockades as a result of conflict or war. The impacts emerging from these types of risks include 1) high costs of shifting production and investment to alternative locations to reduce vulnerability to punitive policies that competitors in other regions do not face; 2) an inability to access essential goods or materials for production; and 3) loss of sales to global competitors that do not face similar restrictions. Other risks that the EU should seek to address through cooperation with global partners include environmental and climate risks (e.g., risks to energy grids due to extreme whether events), natural disasters or public health risks (e.g., the COVID pandemics).

Moreover, given the fact that several Asian economies are of central importance to evolving global ICT supply chains, their roles as growing hubs for trusted supply chain partners continue to be crucial. ITI therefore supports increased bilateral, regional, and multilateral engagement with partner economies aimed at deepening trade and investment relationships and addressing any unintended trade barriers that restrict supply chain resilience. This engagement could include efforts to organise tech-sector specific dialogues, increase digital trade partnerships, enhance regulatory compatibility, and reduce barriers to trade.

5. Strengthen the European Technology Workforce

The semiconductor industry requires workers with highly specialised skills. Maintaining an equipped and trained domestic workforce is key to ensuring a resilient semiconductor supply chain in the EU.

The European Chips Act must prioritise investing in the workforce, including ensuring that the EU will have an adequate talent pool with necessary advanced skills to meet future demand and that covers all the parts of the supply chain (design, manufacturing, assembly, packaging, testing etc...). Europe must urgently put much more efforts into “attracting and training the right talent”. The objective must be to improve academic, technical and information technology education, to update it along these new industrial requirements and more specifically to increase the talent pool for the semiconductor industry in Europe. It is absolutely key to drastically increase in the number of skilled workers through targeted training.

Funding and incentives under the European Chips Act should thus support programs for science, technology, engineering, and mathematics (STEM) and computer science education. Programs should consist of technical training and new advanced hardware for teachers; expanded access to high-quality instructional materials and rigorous STEM and computer science coursework; hands-on practical experience for students; and effective regional partnerships. Moreover, policymakers must ensure that all students have access to high-calibre STEM and computer science education, including underrepresented minorities and women.

It is also imperative to support increased funding and focus on training/upskilling programs in STEM and computer science through partnerships and other initiatives to facilitate placement of EU workers into digitally resilient jobs, including those within the semiconductor industry.

In addition, suppliers, producers, R&D centres, and academia need to be able to attract the best global talent as increasing manufacturing capacity and R&D activities will generate a great number of job opportunities beyond what the EU can satisfy with the domestic talent. Fast-track programs accelerating immigration formalities for skilled workers in the semiconductor industry are needed as other countries also compete for the best global talent.
6. Compete with other Economies to Incentivise Production in Europe

Japan, South Korea and Taiwan all have incentives programs to encourage building of foundries and production of advanced chips in their respective markets, and the United States continues to pursue similar policies. However, it is important to note that the size, scope, and success of government efforts differ, as does transparency around how they are implemented. For examples, Chinese chips policies amount to more than $150 billion in government subsidies intended to position China as the global leader in semiconductors; yet, China still lags behind its competitors in advanced semiconductor development and production capability. As Europe strives to ensure that the European Chips Act are competitive in luring and retaining investments from leading companies, European policymakers should take note of what has worked and what has not in other contexts and not try to outspend government programs that have not proven successful.

Similarly, building on such work, we encourage the EU to leverage discussions in the EU-U.S. TTC to (1) establish a shared position on strong trade policy disciplines that address, among other items, state-owned enterprises and forced technology transfer, and prohibit data localisation and restrictions on cross-border data flows while ensuring appropriate protection of personal data; and (2) develop a strategy for promoting the international adoption of updated disciplines related to unfair trade practices, including through multilateral engagement. In keeping with Pittsburgh commitments to consult and coordinate on the use of domestic measures to ensure that trade policy supports market-based economies and the rule of law, we also encourage the EU to pursue engagement to mitigate collateral consequences for either economy arising from discrete domestic measures. Accordingly, European efforts to support and secure the semiconductor supply chain through complementary domestic actions to target unfair foreign subsidies – including the European Commission’s Proposed Regulation on Foreign Subsidies – should be tailored to avoid undermining legitimate commercial activity that benefits the EU and U.S. economies.