



European Semiconductor Industry Association

POSITION PAPER

The upcoming EU Industry Strategy

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Introduction

The semiconductor industry in Europe is a key player in offering cyber-secure, innovative hardware solutions that enable cutting-edge technologies of the present and future. They are at the heart of the digital & manufacturing transformation: without microcontrollers and -processors, planes stay grounded, ships anchored, trains and cars would be left stationary. Electronic devices of all kind would cease to function, factories would be less efficient and more polluting, and the idea of digitisation be a far-fetched pipe dream. Beyond that, as a strategic sector, semiconductors made in Europe provide the basis for the digital and the ecological transformation, enabling industries to both become smart and reduce their carbon footprint.

In September 2009, the European Commission rightfully identified microelectronics as a key enabling technology (KET) sector. The crucial role of providing the basis for innovations in a wide range of industries such as automotive, industrial, consumer electronics & mobile communications, health and energy, remains the same to this day. With digitisation and connectivity pushing deeper into the fabric of European society, the role of semiconductors as key enablers will continue to grow. Semiconductors companies in Europe are already market leaders for security solutions for passports, IDs and smartphones – creating trust among citizens.

More importantly, the semiconductor industry in Europe also provides the tools for effectively tackling global challenges such as mitigating the effects of climate change. The most important suppliers of automotive semiconductors produce and conduct research in Europe. Modern automotive applications already reduce emissions for road transport. Enhancing the competitiveness of the semiconductor industry equals future-proofing the whole of EU industries, both digitally and ecologically.

The semiconductor industry in Europe is at a critical juncture considering these opportunities, all while facing pivotal challenges, in particular when it comes to trade distorting practices in third countries.

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I. International trade

Recent geopolitical developments give reason to take a closer and more strategic look into EU's approach to industrial policy regarding semiconductors. Unprecedented technological competition as well as aggressive industrial policies from major blocs put semiconductor companies in Europe under increasing pressure. This is why the EU should use all possible tools at its disposal to ensure a level playing field.

First, reform initiatives to update the World Trade Organization's (WTO) subsidy rules as foreseen by the EU, Japan and the United States¹ ought to be implemented urgently. In a more volatile environment, Europe must increase efforts to support & strengthen the multilateral rules-based framework and cooperate with likeminded governments.

Secondly, the members of ESIA expect that the initiatives foreseen under "*EU-China – A strategic outlook*" communication² will result in measures to effectively address distortive effects of out-of-proportion foreign subsidies (as summarised by a recent OECD study³), which pose the threat of overcapacity, are necessary to level the global playing field and allow European companies to thrive and operate in worldwide markets. It is important to ensure the EU's technological leadership & sovereignty, which is why ESIA supports the framework for the screening of foreign direct investments (FDIs)⁴ to safeguard strategic assets.

Thirdly, semiconductor companies in Europe and around the globe already hold regular exchanges with government and authorities in valuable multilateral fora such as the annual Government & Authorities Meeting on Semiconductors (GAMS). The forum facilitates enhancing transparency and gathering information about subsidies and encryption practices that were not notified to the WTO before. Continuing to fully exploit GAMS is necessary to address issues that are not in line with WTO and World Semiconductor Council (WSC) principles of open and free markets and a global level playing field.

To ensure industrial competitiveness in Europe, it is necessary to stand up for transparency on trade distorting subsidies, market access for encryption, prohibition of forced technology transfer practices, and reinstating a rules-based system for global trading. The unparalleled value-to-weight ratio of semiconductors has encouraged the establishment of a truly global supply chain that relies on free, fair and open trade on a level playing field.⁵

The Commission rightly describes technological sovereignty as "*creating the right conditions for Europe to develop and deploy its own key capacities, thereby reducing our dependency on*

¹ European Commission (14/01/2020). *EU, U.S. and Japan agree on new ways to strengthen global rules on industrial subsidies*, News: WTO CASES. URL:

<https://trade.ec.europa.eu/doclib/press/index.cfm?id=2101> (retrieved 17/02/2020)

² European Commission (12/03/2019). *EU-China – A strategic outlook. European Commission and HR/VP contribution to the European Council*. URL: <https://ec.europa.eu/commission/sites/beta-political/files/communication-eu-china-a-strategic-outlook.pdf> (retrieved 31/01/2020)

³ OECD (12/12/2019), "Measuring distortions in international markets: The semiconductor value chain", *OECD Trade Policy Papers*, No. 234, OECD Publishing, Paris. URL: <http://dx.doi.org/10.1787/8fe4491d-en> (retrieved 29/01/2020)

⁴ Regulation (EU) 2019/452 of the European Parliament and of the Council of 19 March 2019 establishing a framework for the screening of foreign direct investments into the Union, *OJ L 79I*, 21.3.2019, p. 1-14. URL: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0452&from=EN> (retrieved 07/02/2020)

⁵ OECD (12/12/2019), *Op. cit.*

*other parts of the globe for the most crucial technologies*⁶; nonetheless, a positive & outward-looking projection of European industrial strengths and values should be the focal point. The vast majority of semiconductors are not designed or produced in one single region. Thus, it is of paramount importance for semiconductor companies in Europe to build and maintain strategic supply & value chains with integrity and to achieve the right measure of technological sovereignty.

II. Digital transformation

The digitisation of European industry is central to ensure the competitiveness and future-readiness of sectors in their respective markets. It heralds a new industrial revolution with smart factories, the Industrial Internet of Things (IIoT), and cloud-based services. In order to transform today's manufacturing hubs into smart factories, and to benefit from the seamlessness of cloud computing, the EU relies on the innovative fortitude of the European semiconductor industry. As the solution provider for the digital transformation, every industrial innovation was first prototyped in a clean room. Hence, the need for further EU support and incentives for research & innovation as well as first industrial deployment – such as through Important Projects of Common European Interest (IPCEI), the Digital Europe Programme (DEP), Digitising European Industries (DEI) and the Horizon Europe Programme – in line with the EU's international obligations should be top-of-the-list for EU policymakers. After all, it is of paramount importance for Europe to build strategic supply and value chains with integrity in order to achieve the right measure of technological sovereignty. Fostering this aim requires Europe to concentrate on enhancing its innovation & manufacturing capacities and to invest in strategic value chains, networks and ecosystems.

Cybersecurity

European semiconductor companies are market leaders in hardware-based security solutions not only for driving licenses, ID, banking and other smart cards, but also for secure elements that are used in almost any applications of the Internet of Things (IoT), e.g. smart factories (in Industry 4.0), connected cars, energy supply grids, connected healthcare services, etc. Today, the need for security and privacy is no longer limited to specific payment or governmental applications. In a digitised world with ubiquitous connectivity, security and privacy are becoming a key concern for businesses and citizens alike. With more & more connected devices, the need for “*security by design*” becomes essential in order to create trust in smart connected solutions.

Since European encryption methods are in demand and recognised worldwide, IT security is a unique selling point for IoT applications “*made in EU*”. High security standards and an efficient cybersecurity certification ecosystem, including the use of the New Legislative Framework-approach (NLF-approach) leading to a horizontal product regulation for cybersecurity, ensure a sustainable market uptake of IoT innovations and protect the consumer from low-quality products. The European Commission should further assess

⁶ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Shaping Europe's Digital Future, COM(2020) 67 final, p. 2. URL: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=COM:2020:67:FIN&qid=1582197584770&from=EN> (retrieved 20/02/2020)

cybersecurity needs and requirements whenever drafting new or revising existing legislation, to reach the highest possible level of consumer protection and boost technology leadership at the same time.

A digitised European industry ought to rely on cyber-secure systems. Protecting EU industry by means of state-of-the-art cybersecurity solutions is of utmost importance to ensure the sovereignty of European economies in the Single Market and beyond, as well as protecting citizens in the connected world.

Artificial intelligence

Artificial intelligence (AI) is going to confront us with unprecedented disruption, as well as improvements and efficiency gains in various fields such as health, transport and industrial manufacturing, and has the potential to help reaching overarching societal goals such as tackling climate change. The semiconductor industry in Europe is at the forefront of developing the necessary processing power that enables AI-based applications. With 500 billion connected devices by 2030⁷, edge computing technology and energy-efficient processors become preconditions for AI since huge amounts of data need to be processed locally with low latency.

A prerequisite for proper and ethical use of the technology is the protection of data used for AI applications, with state-of-the-art security hardware solutions in order to gain trust amongst consumers. When it comes to regulation of AI, it is of key importance to find a balanced approach to not inadvertently hamper innovations in that field. Hence, ESIA welcomes the Commission's White Paper on AI and its plans for creating ecosystems of excellence and of trust.

Industry stakeholders and policymakers should jointly work on measures to support efforts toward the most beneficial deployment of AI, including dedicated R&D programmes.

Mobility (I)

Globally, EU semiconductor manufacturers today have a market share of more than 40% in automotive applications, such as power electronics. Radio frequency (RF) semiconductors allow for connectivity between vehicles (v2v) and between vehicles and infrastructure (v2i) that paves the way for connected & automated driving. Advanced driver assistance systems (ADAS) and vehicle networking technologies for secure data processing save lives on roads in Europe and beyond.

Setting the right framework conditions to support technology innovations developed by European manufacturers should be a key element of the EU industrial strategy. With the EU automotive industry being the largest private investor in R&D,⁸ it is a key interest for the EU to keep the full automotive supply chain for most innovative & clean vehicles within the Single Market.

⁷ Cisco (06/2016). *Internet of Things, At-a-Glance*. URL: <https://www.cisco.com/c/dam/en/us/products/collateral/se/internet-of-things/at-a-glance-c45-731471.pdf> (retrieved 28/01/2020)

⁸ ACEA | European Automobile Manufacturers Association. *Facts about the Automobile Industry*. URL: <https://www.acea.be/automobile-industry/facts-about-the-industry> (retrieved 29/01/2020)

5G infrastructure

Semiconductor companies in Europe are market leading in the power and RF segments. All products related to IoT, traffic, health care, and supported by connectivity will benefit the European citizens in their daily lives to improve everything from business to private affairs. In this respect, it is most essential, for Europe, to have full technological mastering of the aspect of trusted manufacturing. From that perspective, EU policymakers should intensify R&D support and market development activities for 5G.

eHealth

European demographic trends of a projected 45% increase of people aged 65 and older in the next 20 years⁹ require health-related technological developments that will help Member States in keeping social costs under control. The upcoming envisioned data-driven services favoured by AI and 5G infrastructure will impact different application domains amongst which healthcare, through provisioning of new personalised approaches to healthcare management. Those developments are strongly based on new and powerful sensors, biosensors and on improved and “AI-assisted” clinical data sharing.

III. Ecological transformation

Even more significant than the opportunities of digitisation, is our duty to transformation ecologically toward a carbon-neutral economy and society. From energy savings on daily commutes and less electricity-hungry electronic devices, to more efficient management and transmission of energy sources themselves: semiconductors help reduce consumption and potential losses, improve their use, and ultimately, cut carbon emissions to reach the EU's ambitious 2050 goals.

Mobility (II)

Smart mobility solutions such as traffic management, climate-friendly modes of transport as well as innovative powertrain technologies including e-mobility, hydrogen and synthetic fuels bear large potential for emission reductions. Semiconductor companies producing and researching in Europe are amongst the most innovative technology suppliers enabling the shift to more sustainable mobility concepts. Power electronics and ADAS solutions help reduce carbon emissions, thereby advancing towards the ambitious goals of cutting 90% of carbon emissions in transport by 2050.

Energy efficiency

Digitisation offers numerous opportunities to render people's lives easier and more convenient, all while opening large efficiency & market potentials for the European industry. Today, data centres – the backbone of digital services worldwide – consume huge amounts of energy.

⁹ eurostat (07/2019). *Population structure and ageing*, Statistics Explained. URL: https://ec.europa.eu/eurostat/statistics-explained/index.php/Population_structure_and_ageing (retrieved 17/02/2020)

Their carbon emissions are already on a par with the airline industry.¹⁰ And, with more and more processing power being requested for e.g. big data and AI applications, electricity consumption is expected to rise even further. The way to address these challenges is less energy intensive hard- and software. The semiconductor industry in the EU provides the latest high-performance energy management & saving solutions for power supply, renewable energies, smart metres as well as IoT devices.

When implementing the European Green Deal into concrete policy measures, the Commission should insist on latest technology innovations and R&D to position EU industry as the forerunner in green and carbon-neutral solutions. Semiconductors play an important role in renewable energies, ensuring that less energy is wasted through the realisation of smart grids.

Conclusion

An EU Industrial Strategy has to strengthen the assets of European industry by enabling its enablers. Free, fair & open trade on a level playing field will allow for European innovations to thrive around the world and to fight global challenges with solutions “*made in EU*”. However, advanced digitisation opens the gates to increased cyberthreats. Hardware-based security solutions from the EU can help mitigate those risks. Energy savings through innovative power management and smart technology solutions will help humanity in its fight against climate change, to keep the planet habitable in the future.

The EU Industrial Strategy has to take a more pro-active policy approach to stronger position EU industries in international competition. The semiconductor sector in Europe needs enabling conditions and a solid framework that incentivises to further innovate and invest. Then, the semiconductor industry will be able to provide key digital technologies that help digitise a broad range of industries in the EU, render them more energy-efficient, and contribute to tackling global challenges as climate change. A more global strategic approach to key value chains that enable both the digital and ecological transformation must therefore become an essential element of the EU industrial strategy.

¹⁰ PEARCE Fred (03/04/2018). “Energy Hogs: Can World’s Huge Data Centers Be Made More Efficient?”, *YaleEnvironment360*. Yale School of Forestry & Environmental Studies. URL: <https://e360.yale.edu/features/energy-hogs-can-huge-data-centers-be-made-more-efficient> (retrieved 29/01/2020)

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ABOUT ESIA

The European Semiconductor Industry Association (ESIA) is the voice of the semiconductor industry in Europe. Its mission is to represent and promote the common interests of the Europe-based semiconductor industry towards the European institutions and stakeholders in order to ensure a sustainable business environment and foster its global competitiveness. As a provider of key enabling technologies, the industry creates innovative solutions for industrial development, contributing to economic growth and responding to major societal challenges. Being ranked as the most R&D-intensive sector by the European Commission, the European semiconductor ecosystem supports approx. 200.000 jobs directly and up to 1.000.000 induced jobs in systems, applications and services in Europe. Overall, micro- and nano-electronics enable the generation of at least 10% of GDP in Europe and the world.