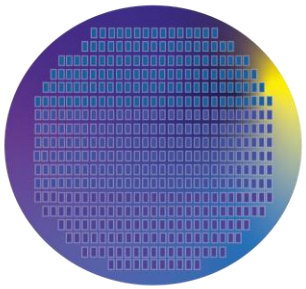


AESEMI

ASOCIACIÓN ESPAÑOLA DE LA INDUSTRIA DE SEMICONDUCTORES

Response to the Public Hearing process on the Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures to strengthen the European Semiconductor Ecosystem (Chips Act)

March 2022

1. AESEMI´s introduction

1.1. Introduction and context.

AESEMI is the Spanish Semiconductor Industry Association, an entity that represents the main spanish companies dedicated to microelectronic design and semiconductor manufacturing. The Association was founded at the end of last year 2021 by the companies Wiyo (Yocto Technologies), Imasenic, Kdpof and ICMálaga. Its creation was motivated by the deep need to provide the sector with its own entity to channel the feelings of the industry in such a dynamic context as the one we live in, in which semiconductors have become a strategic asset on which key industries for the European Union depend.

The objective of our association is to provide visibility to all the companies that are part of the semiconductor ecosystem in Spain. Thanks to this platform, **we boost not only the growth of this industry, but also open a window of collaboration for large companies to find incentives to invest in our country to meet the commitments of decarbonization and digitization** signed in the European Union, which are a common factor for all industries, already at a global level. It is also a fundamental part of our objectives to distinguish the capacity of universities and professionals, as well as to position Spain as a technological center with disruptive options and capabilities.

1.2. The commitment of the semiconductor industry as a starting point for the development vectors.

At the Spanish Semiconductor Industry Association, we are aware of the essential role played by microelectronics in the 21st century, necessary to support technological advances and the huge demand for ever faster, more connected and powerful devices, but at the same time smaller, more efficient and sustainable.

Semiconductors are undoubtedly an essential element for the industry to develop new products and services such as connected and intelligent mobility, or for implementing 4.0 capabilities in our industry, not only in Spain but throughout Europe. Without chips, the digital sector could not exist. Despite this need, the reality in the European Union has resulted in a permanent clash with the lack of supply since, until now, the focus of mass production of these components has been in Asia and America. In this sense, many European sectors, such as automotive, energy, communication and health, as well as strategic sectors, such as defense, security and space have been threatened by such supply disruptions.

In AESEMI we are aware of this situation and for this reason **we are working to strengthen the semiconductor industry in the European Union and especially in Spain, since otherwise it will be impossible to achieve the joint objective of strategic autonomy for Europe**.

1.3. The European Chip Law: the beginning of a new horizon for the sector.

The European Commission, aware of the enormous challenge facing the Union in terms of technological capabilities, has clearly stated its commitment to the semiconductor industry through its proposal to regulate the sector in the "European Chips Act", which aims to strengthen the capabilities of the innovation, development and manufacturing ecosystem of these components to guarantee the necessary supply to the European industry through significant financial incentives and a solid regulatory framework, with a special focus on guaranteeing safety

in the production chain. According to the Commission's latest reports, it is stated that the Union has the necessary assets to become an industrial leader in the semiconductor market of the future.

From the Association, we are more than aware of the unique **window of action that is opening for Europe and, in particular, for all the agents of the sector to be able to participate in the process of ideation and development of the regulatory framework of the industry. For this reason, we place ourselves at the disposal of institutions and public and private agents to be able to debate the bases for the future of our sector, and we formulate the proposals and considerations contained herein.**

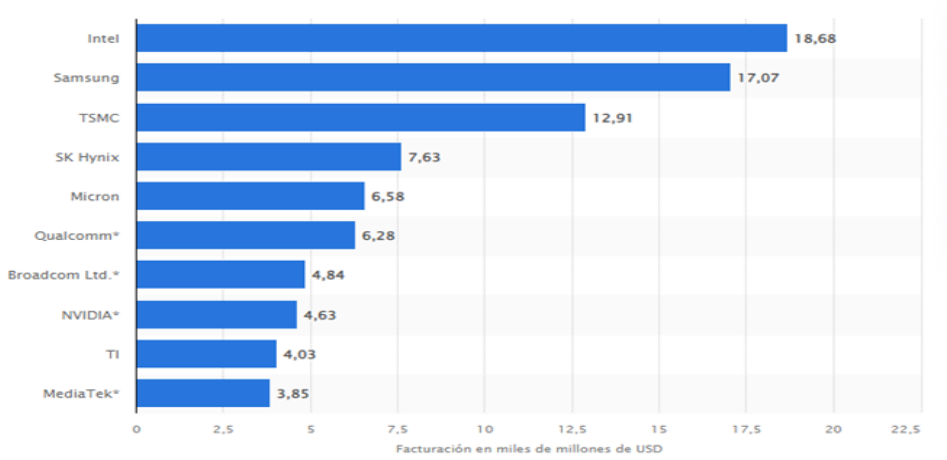
2. Introduction and assessment of the current context in the semiconductor industry.

2.1. The global microchip market.

One of the main characteristics of the semiconductor industry is its strategic nature and its high geographic and strategic concentration: on the one hand, 80% of the world's semiconductor manufacturing and production takes place in Southeast Asia and, on the other hand, there are only two multinationals that carry out the complete semiconductor cycle, which are the American company INTEL and the Korean company Samsung. Equally striking is the fact that this concentration has been increasing over the last few years.

In this context, in 1990, Europe, the United States and Japan were the undisputed leaders in global semiconductor production: Europe supplied 44% of the world's chips, the United States 37% and Japan 19%. It was with the entry of South Korea, Taiwan and later China into the market that, from the 2000s onwards, their market share was progressively reduced, and, at the same time, their market share increased to reach 60% for Taiwan and 20% for South Korea, i.e., a total of 80% between them.

Likewise, and according to data from the World Semiconductor Council (hereinafter, "WSC"), the global semiconductor market totaled $440.4 billion in revenues in 2020 and a year-on-year increase of 6.8%. Annual sales by country/region increased in the Americas (21.3%), China (4.8%), Japan (1.3%) and Asia Pacific/all others (5.4%), while sales decreased in the EU (-5.8%). Sales by end use were led by IT (32.3%) and communication (31.2%), followed by industry (12.0%), consumer (12.0%) and automotive (11.4%). During the first quarter of 2021, Intel and Samsung remained afloat leading the billing ranking, just as they did in 2020. The third position on the list goes to the Taiwanese TSMC, which has become one of the major foundry companies in the world.



Fuente: Statista.

2.2. The role of COVID-19 in the supply crisis and the semiconductor shortage.

COVID-19 has played a decisive role in the semiconductor industry worldwide. The temporary closure of manufacturing plants, severe droughts in the main producing regions, trade tensions between China and the United States, increased purchases of electronic devices and health

restrictions on the flow of passengers and goods have put companies in the sector on the ropes, as not only the quantity of chips demanded has increased, but also their complexity. In this sense, **semiconductors are moving towards omnipresence.**

In the face of this situation, China has called chip self-sufficiency a national priority in its five-year plan and Joe Biden has pledged to build a secure U.S. supply chain by reviving domestic manufacturing, with an investment of $52 billion[1].

It is equally undeniable that the lack of semiconductors has posed one of the greatest threats to Europe's post-pandemic economic revival. In recent months, their shortage has distressed companies in multiple sectors, from consumer electronics to car manufacturing. **The European Commission estimates that 22% of Spanish manufacturing companies have been forced to reduce their supply because of the lack of supply**. It is motor vehicle manufacturers that are suffering the most severely from this crisis, second only to manufacturers of electrical material and equipment, rubber and plastics.

2.3. The Russian-Ukrainian war and its potential impact on the sector.

Although it was certainly the Covid-19 pandemic that first brought this geostrategic problem to light, **the global supply shortage has been further aggravated by the impact of the conflict between Russia and Ukraine**. This is because the latter is the world's leading producer of neon gas, an essential raw material for chip manufacturing.

It should be noted that, although it is considered an unlikely scenario for the time being, in the event that the war were to halt supply completely, it could lead to a new global shortage with serious consequences for the European Union, and especially for small producers: while large chip manufacturers such as Intel, Samsung and TSMC have greater access to inventory, other chip factories do not have this protection and could run out of stock in a few weeks causing a catastrophe at the international level.

For the time being, the industry has suppliers of key materials and gases, so that the conflict does not present any risk of immediate interruption. However, the situation illustrates once again the undeniable need for the EU and Spain to boost this strategic sector and enhance their sovereignty in the world.

2.4. Main challenges and the future of the sector.

In addition, some of what are the main challenges facing the sector in the coming years should be outlined. Firstly, given the exponential growth forecasts for this sector, the investment required to set up semiconductor factories on our continent will require considerable investment and effort. In the short term, having high-tech microchip factories like those in Southeast Asia is an ambitious goal. Therefore, it should be noted that the implementation of the capacity to manufacture chips requires the prior overcoming of major obstacles, such as the following:

- Access to minerals.
- The need to invest substantial amounts for the installation and start-up of new chip factories, as these involve large capital and time efforts (between $10 billion and $20

[1] S.A.S., E. L. R. (n.d.). *Joe Biden Necesitará Más de US$52.000 millones para recuperar La Industria de Chips*. Diario La República. Retrieved March 29, 2022, from https://www.larepublica.co/globoeconomia/joe-biden-necesitara-mas-de-us52000-millones-para-recuperar-la-industria-de-chips-3182675

billion and 2 to 3 years since construction starts until it is operational [2]), **especially for the latest generation of chips**. In addition, the cost of operating a chip fab in Europe is much higher than in Asia or the U.S., and this can easily lead ultimately to even higher prices for customers.

- The resulting lack of commercial interest on the part of companies to make huge investments with relative expectations of future profitability.

On the other hand, in the medium term and thanks to the new initiatives mentioned below, it would become more viable **to set up factories that supply our own industry, with more robust technologies at larger nodes**, which is what industries such as the automotive or health industry need. Likewise, measures **to reinforce the microchip technology already existing in our territory, as well as investment in the reinforcement of current design capabilities**, could be essential for the sector.

On the other hand, it is predictable that the growth in memory demand will eventually outstrip the global supply of silicon, offering opportunities for radically new memory and storage solutions. The growing demand for computing power in the face of global energy production is creating a new risk, and new computing paradigms offer opportunities for dramatic improvements in energy efficiency.

Finally, despite the fact that, as anticipated, there are long-term growth drivers (AI, 5G/6G, high-performance computing, IoT, etc.), it should be cautioned that uncertainty in the global environment may affect semiconductor market growth.

It is for all of the above reasons that, in order to advance in the promotion of the semiconductor sector in Spain and in Europe, we welcome the presentation of this public hearing, and we take this opportunity to insist that **only through public-private collaboration will it be possible to contribute to the promotion of the sector both in the European Union and in our own country.** We must promote initiatives that favor the objectives of the European Union and the development of the sector, through the generation of appropriate business incentives and the development of modern and intelligent regulations.

[2] Bloomberg. (2021, May 10). *¿Por qué es tan complicado fabricar más chips?* Cinco Días. Retrieved March 29, 2022, from https://cincodias.elpais.com/cincodias/2021/05/07/companias/1620389812_558345.html

3. Strategic sovereignty framework as a turning point to strengthen the capabilities of the chip design and manufacturing union.

In view of the above and to avoid excessive technological dependence on Southeast Asia, the United States, China, Japan and the European Union, among others, are betting on manufacturing semiconductors directly in their respective territories, increasing local production and diversifying production in order to have greater security in the event of unforeseen events, as well as to avoid excessive dependence on a few companies of foreign origin.

3.1. European Technological Sovereignty: a strategic sector.

Indeed, the European Union intends to encourage technological development to increase its technological sovereignty for geostrategic reasons through large-scale deployment and the broadening of its diffusion and introduction in areas of public interest and in the private sector, all with the intention of maximizing the benefits of digitization. Among the strategic sectors for the European Union, semiconductors now occupy a special chapter, especially after the controversies caused by their scarcity during the COVID-19 pandemic.

Therefore, on July 19, 2021, the Commission launched a *Processor and Semiconductor Technology Alliance*, with the aim of ensuring that Europe has the capacity to design and produce the most advanced chips, while reducing its global strategic dependencies.

Also, on September 15, 2021, Commission President Ursula von der Leyen announced an EU Chip Act in her State of the Union address, noting the need to pool Europe's world-class research capabilities and coordinate EU and national investments along the value chain to jointly create a *state-of-the-art European chip ecosystem,* including, among other objectives, chip manufacturing.

In continuation of the above, on February 8, 2021, the Commission announced a **package of measures to address the shortage of semiconductors and mechanisms to boost this industry** in what was called the *European Chips Act.* This package consisted of the following initiatives:

- The Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures to strengthen the European semiconductor ecosystem in Europe (*Chips Act*).
- The Proposal for a Council Regulation amending Regulation (EU) 2021/2085 setting up joint undertakings under Horizon Europe, as regards the Chips Joint Undertaking (*Chips Joint Undertaking*).
- The Commission Recommendation of February 8, 2022, on a common Union toolkit to address the semiconductor shortage and a Union mechanism for monitoring the semiconductor ecosystem.

The ultimate goal set by this legislative package, and especially the so-called '*EU Chip Act*', is **to build on Europe's strengths and address outstanding weaknesses, to develop a thriving semiconductor ecosystem and a resilient supply chain, while putting in place measures to prepare for, anticipate and respond to future supply chain disruptions.**

Although the approval of the proposed regulations may be delayed in time, the recommendation addressed to the Member States, as will be developed below, constitutes a "toolbox" that is directly applicable so that mechanisms to understand and anticipate future semiconductor crises can be established in the short term, in close collaboration with public and private stakeholders.

The measures, once approved, will **strengthen manufacturing activities in the Union and support scale-up and innovation across the value chain by addressing security of supply and a more resilient ecosystem**. In the medium to long term, they will reinforce Europe's technological leadership while preparing the necessary technological capabilities that will support knowledge, transfer from the lab to the factory floor and position Europe as a technological leader in innovative downstream markets.

This legislative package is part of the activities to promote *Europe's Digital Decade*, which aims to **have 20% of the world market share of chip production by 2030**, and within the political framework to **promote European Digital Sovereignty**, in which, in turn, other initiatives have been launched, such as the Proposal for a European Data Law or the proposals for a Regulation on Digital Markets and Digital Services.

4. On the Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures to strengthen the European semiconductor ecosystem in Europe (Chips Act).

The following analyses the content of the Proposal for a Regulation, followed by AESEMI's assessment. The content is based on the structure of the text published by the European Commission, which is set on three pillars: *the Chips for Europe initiative; the measures aimed at guaranteeing security of supply*; and the f*ramework for action in the event of supply crises*, which covers the actions to be taken in certain situations, the community governance scheme for semiconductors, and the applicable sanctioning framework.

Section 4.1 - Brief content analysis.

4.1.1. Chips for Europe Initiative.

The Chips for Europe initiative builds on the foundations of the *Digital Europe Program*, which seeks to develop capabilities in key areas where semiconductors are used, such as High-Performance Computing, Artificial Intelligence or Cybersecurity; as well as on existing Horizon Europe funding streams that are transformed in order to address the specific objectives of the initiative. Of particular interest in this context, is the constitution of the first IPCEI on microelectronics in 2021.

The Chips for Europe initiative is endowed with a total budget of €3.3 billion, of which €1.659 billion under Horizon Europe and another €1.65 billion under the Digital Europe Program. This envelope will be implemented mostly through the Chips Joint Undertaking (€2,875 million).

The main objective of the initiative is to support the large-scale construction of production and innovation capabilities in the Union to position itself at the forefront in the development of next-generation semiconductors and quantum technologies. Specifically, this support will be provided through five different lines of action[3]:

1. The development of large-scale manufacturing capabilities in the union, with three main points:

   ➔ An innovative virtual platform will be built, which is available in the Union and integrates existing and future resources and facilities, providing extensive libraries and Electronic Design Automation (EDA) tools.

   ➔ Microelectronics design capabilities will be boosted through innovative developments, especially with processor architectures based on reduced instruction set open source (RISC-V).

   ➔ The semiconductor ecosystem will be developed by integrating new vertical markets that fit with the Union's green and digital transition objectives.

[3] De acuerdo con el documento *Chapter II: Chips for Europe Initiative. 2022/0032 (COD) - Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework of measures for strengthening Europe's semiconductor ecosystem (Chips Act)*.

2. The reinforcement and development of new pilot lines, with three action points:

   ➔ **The integration of R&D activities for new technologies, especially for devices and nodes smaller than two nanometers.**

   ➔ Supporting large-scale innovation through access to new possibilities for experimentation, testing and validation.

   ➔ Giving priority to Integrated Production Facilities or Open Foundries that are recognized by the union, in access to financing and to the aforementioned resources. These concepts will be further developed below.

3. The promotion of new technological skills oriented towards the development of quantum chips.
4. **The creation of a network of high competence centers that can reinforce union skills and training at different levels, with a special focus on SMEs.**
5. **The boost to entrepreneurship, which will be supported by a "Chips Fund", to facilitate access to debt financing for start-ups, scale-ups and SMEs, as well as other companies in the semiconductor value chain.**

For the development of these lines of action, the European Chip Infrastructure Consortium will be established, which will have legal personality and will be constituted by the Commission, the States and public and private entities of the States. Regarding the centers of high competence, the States will propose three candidate centers to integrate the network, with the objective of creating an ecosystem that facilitates access to services and design tools, of increasing awareness and knowledge about the semiconductor industry, and promotes the transfer of knowledge vertically and horizontally.

4.1.2. Security of supply

To ensure security of supply, the proposed regulation begins by establishing measures to promote the establishment of semiconductor production facilities in the European Union. The text proposes two types of eligible facilities:

1. **Integrated production facilities:** are those that produce or design semiconductors, performing both back-end and front-end tasks, and that contribute to the security of supply for the domestic market.

2. **Open production facilities or "Open EU Foundries":** are those that produce or design semiconductors for companies other than the Foundry owner, performing both back-end and front-end tasks, and that contribute to the security of supply for the domestic market.

Both types of facilities, however, have to meet other requirements such as **ensuring that they are not subject to public service obligations with third countries in a way that may hamper supply in the Union, ensuring that their establishment and operation have a real positive impact on the semiconductor value chain,** and being considered as first-of-a-kind, or "pioneer facility". By "pioneer facility" the proposed regulation means an industrial facility capable of manufacturing semiconductors, which is not already substantially present or committed to be built in the Union. Installations with these statuses will be considered to be in the public interest for their contribution to security of supply and will therefore be given every possible priority in the granting of permits for installation and uses, including urban planning and environmental permits.

4.1.3. Monitoring and response to supply crises.

The provisions relating to coordination between the Commission and Member States for market monitoring and response to supply crises coincide with the content of the aforementioned recommendation and are intended to replace it once the regulation is approved.

The proposed regulation states that states should regularly monitor the semiconductor value chain, detecting early warning identifiers and monitoring the availability and integrity of the services and goods provided by the different actors in the value chain. To this end, as indicated in the recommendation, they should contact key semiconductor users and industry representatives to obtain this information. In order to facilitate this transmission of information, States should also establish an administrative mechanism to coordinate and receive regular updates from industry.

Any risk will be communicated to the Commission, which will convene the ***European Semiconductor Board*** as a matter of urgency to assess the risk of a possible crisis and the action to be taken if necessary. The European Semiconductor Board will be further developed in the following section.

States will also identify key market players, based on the third parties dependent on their products or services; their market share; the importance of maintaining an adequate level of supply, taking into account possible substitutes; and the impact of an incident on their production.

In the event of a supply crisis, the European Commission shall activate the crisis phase and thereby the toolbox which shall empower the Commission, after consulting the ***European Semiconductor Board***, to request information from organizations, companies or individuals on their capacity, availability or incidences in order to analyze the nature of the crisis. The Commission may impose on the facilities recognized in the previous paragraph the obligation to prioritize supply to key or critical consumers, over and above any other public or private law mandate.

If states so require, the Commission may make joint purchases of products to address the crisis.

4.1.4. European Semiconductor Council.

The *European Semiconductor Board* will be the main governance body for semiconductors in the Union, advising the Commission on decisions on crisis situations, on facilities recognized by the Union as being of public utility, on the Semiconductor Joint Undertaking or on new technologies or capabilities with particular impact.

The board shall be composed of one senior representative from each Member State of the Union and chaired by a representative of the Commission.

4.1.5. Sanctioning framework and implementing provisions

The Commission may impose sanctions in case of culpable negligence affecting the supply chain, refusal to inform upon request or refusal to comply with the mandate of preferential supply to critical entities and consumers.

In developing the provisions of the regulation, the Commission shall be assisted by a "Semiconductor Committee" and shall consult with a panel of experts composed of experts proposed by the Member States.

Section 4.2 - AESEMI's assessment and proposals.

3.2.1. General assessment of the incentives proposed..

Although the overall assessment of the proposed Chips Regulation is positive, **one cannot overemphasize the fact that the incentives proposed are geared to accommodate macro projects that will mainly strengthen the large companies in the semiconductor industry, leaving small companies in the background**, whose access to financing will be largely conditioned by projects that are ancillary or complementary to those proposed by the large companies.

Therefore, although this will have a positive impact on some European Union economies that have a more consolidated semiconductor industry, in Spain the reality of the sector, where there is no manufacturing capacity and the industry depends entirely on foreign companies to carry out these processes, means that, **as the incentives are designed, they will not generate the expected momentum.**

In general, more incentives are needed for the design segment of the value chain, as it is a key capability in the semiconductor market to design novel systems adapted to different user needs. In the case of Spain, only chip design functions are developed. Today, most European and Spanish companies run their businesses on the basis of fabless models in which they outsource all (or part) of their manufacturing to foundries, and in Spain there are 20 companies dedicated to microchip design.

For this reason, **the Union should build and strengthen its own capacity to innovate in design and facilitate the process of subcontracting with foundries to streamline their production process. This objective is fully in line with the European Chip Strategy**, where Europe should build and strengthen its own capacity to innovate in advanced chip design in order to play a relevant role in this part of the industry. This will ensure in Europe, and more specifically in our country, the long-term supply of chips, serving the needs of industry and the public sector and stimulating innovation in the broadest sense.

For its part, we believe that in Europe's efforts, it would be more viable to set up semiconductor production facilities that primarily supply the Community's industrial fabric, giving priority to the installation of factories that supply our own industry (health, vehicles, domestic appliances), as opposed to 2nm nodes, which represent a high cost and would be less viable in the short-medium term.

On the other hand, for smaller nodes, a common fund could also be created, where European companies would have guaranteed shares in non-European foundries to boost future technologies, such as AI, and 5G-6G communication.

3.2.2. Improve the development of manufacturing capabilities in Electronic Design Automation (EDA).

In the Chips Act it is proposed to build an innovative virtual platform, which is available in the Union and integrates existing and future resources and facilities by providing extensive libraries and **Electronic Design Automation (EDA) tools**.

This type of software is essential for semiconductor design, as it allows working in an integrated environment executing operations at very different levels within the design phases of a chip. The design flow encompasses very disparate tools, for which there are currently no suppliers within

the European Union. An EU open-source EDA tool would be an exceptional step forward to enhance EU design capabilities, as it would avoid the current dependence on foreign design software, which has costs that are almost unaffordable for small companies.

In this regard, we consider that:

1. **The European Chip Infrastructure Consortium should be responsible for studying the feasibility of proposing a design flow with an open-source toolset**, i.e. a completely European software package to provide the EDA design, and the different countries of the Union should be assigned the development of each of the specific programmes that make up the Flow, defining and monitoring the compatibility of all the components with each other and with other market components. The weakest point in this respect would be how to finance this software.
2. In this context, EDA tools must be compatible with prototype and low-production foundries, as well as with European foundries, and integrate existing standards such as Risk-V, which European industry is currently supporting.
3. However, as regards the creation of open libraries or design models in the European Union, their contribution and use should be voluntary, **independent of the use of free software, since the designs of each company are the real added value and differentiating factor of the Chip.**
4. In addition to design-aided design software, **it is intended to build a large-scale design infrastructure for integrated semiconductor technologies** through a virtual platform, facilitating user cooperation with design houses, start-ups and SME IP providers. Therefore, the Commission should facilitate the membership of interested parties, including innovative SMEs, so that they have full information and access to the design infrastructure, with clear IP rules.

3.2.3. Strengthening the European ecosystem by focusing also on mature industries, such as analogue and automotive.

There are currently two main strategies employed in industry for the development of electronic components such as semiconductors: more Moore and more than Moore. The first route follows the line of developing technologies with smaller nodes (digital such as AI), in which the European industrial fabric is not as specialised, while the second focuses on larger nodes that concentrate on delivering the best performance and diversifying integration technologies, such as in semiconductors used in the analogue or automotive market, in which European companies are well positioned.

On this basis, the Chips Act has a clear focus on digital edge technologies (small nodes) with an explicit reference to 2 nm nodes. However, it should not be forgotten to further strengthen Europe's capacity in the market where it is strong and on which most of its industry depends.

The following is proposed:

1. Care should be taken not to focus only on smaller production capacities and to reinforce the model of More than Moore's foundries (mature technologies), where Europe is strongest. We therefore propose that the European Chip Infrastructure Consortium should focus not only on future technologies such as AI, but also on the technologies that industry currently consumes in the majority and put forward proposals to promote them and boost

their greater robustness and lower consumption (FG-SOI type) rather than in the direction of the sub-nanometer.

2. Foster investments in a 40-65 nm foundry in the European Union.

3. Encourage investment in a foundry that can develop the necessary technology modules to More than Moore.

3.2.4. Increasing investment in production, through new possibilities for experimentation

Regarding increased investment in production, we consider it essential to explore the following initiatives:

1. **Investment in pilot lines, as well as in advanced design of test and experimental facilities and tools, while having pilot lines for access to the supply chain under open conditions** is essential for the production of EU companies. Similarly, the creation of unique world-class facilities would facilitate the process.

2. In the same way that an innovative virtual platform for software is proposed, we propose a virtual platform for open prototyping, so that the contracting of **manufacturing batches for prototyping (shuttles) with concrete deadlines in different European Open Foundries is coordinated with an annual planning in advance**. In this way, the investment of prototyping and low production foundries will be favored, for progressive scaling up before going to high production. SMEs from different European countries and research centers would be able to contract a certain area for their prototyping, so that this virtual platform, which is understood to be financed with EU funds, should recover all its investment if the different companies contract 100% of the available area. In this way, SMEs would have economic access to silicon and, more importantly, would be able to plan their projects according to established deadlines and prototypes. The spirit of the proposal is similar to Europractice, but with a more industrial approach and independent of the Foundries.

3. **Investment in new technologies applied to the semiconductor industry should be encouraged and prioritised**, such as the development of chips for use in quantum computing, which can be combined with both existing and easy-to-apply manufacturing technologies, such as room temperature CMOS, and novel technologies such as carbon nanotubes.

4. With regard to the chip fund, we believe that too frequently, companies have to appeal to financial models based on venture capital or participatory capital funds, which in most cases do not have sufficient muscle to sustain the investment until the maturity period of this type of product; periods of five, seven or ten years are common to mass-produce markets large enough to make a chip profitable. Therefore, these funds end up converting the company into the "product", revaluing them with patents and tax incentives accumulated to be sold to third parties before the product reaches the market, often losing the resources invested over the years.

   We propose to:

   i) Study models of joint state entry into the company's capital, with returns and exit of capital during the first years of production or sale of participation guaranteeing the activity.

   ii) Study models from other countries such as Israel, or tools such as innovative public procurement.

iii) **Attracting external investment is essential to have the capacity to produce the most advanced chips, to serve users with new needs and to diversify access to markets, addressing those where Europe is not present today, while strengthening security of supply in critical sectors such as public safety.**

For this reason**, we call for more incentives for international microchip companies to set up in the Union and the Member States, as well as a strategic plan for international agreements with countries that already have a manufacturing industry.** In this way, Europe can become a fertile ground for foreign companies to set up such centers.

3.2.5. Strengthen security of supply to improve semiconductor production capacity in Europe.

Security of supply is not only about implementing open Foundries in Europe, but also about supporting second source strategies that involve Fabless companies and final assemblers in the transposition (redesign) and qualification of existing key proprietary products into new European Foundries. Therefore, we recommend:

1. Opt for the **establishment of Open EU Foundries** as a counterpart to Integrated Production Facilities, since the first offers a significant degree of their production capacity to other industrial players, such as fabless semiconductor companies.Today there is insufficient support for this type of companies, which requires large investments in order to gain access to the international production fabric. At the same time, it would be very useful to strengthen the production of equipment for this industry, which involves the development of manometric technologies.
2. Ensure that, in installations recognized as open foundries by the European Union, permits for such installations and foundries are granted through fast-track procedures.

3.2.6. Strengthen intellectual property mechanisms.

With regard to the strengthening of intellectual property mechanisms, we consider the following to be essential:

1. Create foundries that enable the development of new IPs proposed by fabless companies. The model needs to be well thought through so that ownership of new IPs can be preserved.
2. Consider establishing mechanisms to defend against IP theft internationally.

3.2.7. Creation of a network of centres of high competence.

Finally, it is appropriate to address the creation of a network of centres of high competence along the following lines:

1. Support the network of competence centres proposed by the European regulation to provide expertise to SMEs, end-users, start-ups in order to facilitate open, transparent and non-discriminatory access. They could become poles of attraction for innovation and highly qualified talent.

2. However, we convey the need to ensure that these centres do not become public instruments that replace innovation activities more suited to private industry, which would end up competing with them and hindering the development of SMEs and Europe's innovative fabric.

3.2.8. Improve R&D tax incentives.

The semiconductor industry is characterised by intense R&D activity, with companies reinvesting more than 15% of their revenues in research into next-generation technologies.

1. Facilitate the recognition of companies in the sector as **innovative SMEs so that they can more easily benefit from R&D&I tax deductions.**
2. **Improve legal certainty and make it accessible to small and medium-sized industry players.** In this sense, the European Union would bring great added value to the industry through the elimination of administrative barriers, the increase of financial guarantees for long-term investments, the adaptation of calls for proposals to the design and development deadlines of a standard semiconductor. Similarly, the reduction of administrative burdens in the follow-up phase of implementation and final justification, together with the implementation of public entities to support the submission of applications and advice on procedures, would be very valuable.

3.2.9. Boosting the recruitment of specialised staff and attracting talent.

The Commission must address the severe skills shortage, attract new talent, and support the emergence of a skilled workforce, as the current shortage is limiting efforts to strengthen the ecosystem.

1. **The Commission should promote a comprehensive Semiconductor Talent Attraction Plan, including graduate and postgraduate degrees in this field.** In addition, policies, and grants for the recruitment of specialized engineers should be included, for example by promoting microelectronics at university level.
2. We recommend the implementation of a strategy to promote and **facilitate the establishment of design centers, owned or operated by established European semiconductor companies**, in countries with little activity in the sector. This would train engineers in European third countries with knowledge and experience of the real industry.
3. With regard to point b), this aid for the establishment of external design and development centers does not have to take the form of tax incentives, direct aid or contracting (which is also possible). It would be interesting to consider that in the countries where these centers are set up, they could be considered as companies belonging to the country where they carry out their activity, and could participate in the European sphere as SMEs, provided that they do not impose the costs of the parent company in these countries. This would achieve goals such as the distribution of knowledge, the creation of competent design centers, taking advantage of the flexibility and dynamism of SMEs and speeding up the time to market for designs thanks to their belonging to consolidated companies, but, above all, making it possible for medium-sized industry in those countries where they are established to access micro-integration technology, ultimately creating local synergies and broadening the semiconductor ecosystem.

i) In this respect, the EU is in an excellent position to implement this strategy due to the quality of its engineers and the numerous ancillary industries in the automotive, machine tool, tourism, health, etc. sectors, which in a few years could climb up the qualitative ladder by incorporating micro-integration into their development capacities. It is an initiative that requires little direct investment, potentially very beneficial but requires rethinking the legislative points concerning subsidies and the considerations of related/dependent companies and groups of European companies.

4. **The Europractice model**, which is already very successful in Europe with universities and public research institutes, could be extended to start-ups and SMEs.

5. Incentives for the recruitment of research staff should be strengthened and increased, as well **as incentives for research staff coming from other countries**, i.e. through the contracting of non-EU staff.

4. On the Proposal for a Council Regulation amending Regulation (EU) 2021/2085 setting up Joint Undertakings under Horizon Europe as regards the Chips Joint Undertaking.

Section 5.1 - Brief content analysis.

As discussed above, the proposed regulation begins by renaming the *Key Digital Technologies Joint Undertaking* to the *Chips Joint Undertaking*, or *Chips Joint Undertaking*, to channel the funding available under the Chips Initiative for Europe.

All initiatives to be funded under the Chips Joint Undertaking will fall within the action lines set out in the Chips for Europe Initiative and will be validated by the programme's Governing Board, which will draw up a multiannual work plan detailing the specific calls and programmes. The European Semiconductor Council, the European Chip Infrastructure Consortium and the Public Authorities Council of the Union will also be involved in the elaboration and approval of this work plan.

The Governing Board of the programme will be composed of members of the Commission and public authorities of the Member States, together with other participants from representative associations of the sector. In voting on actions to promote productive capacities, at least 50% of the votes shall be secured for the Commission.

Funding actions aimed at R&D would only be accepted if they involve a consortium of at least three entities from three different Member States. Such a consortium may be structured through the European Chips Infrastructure Consortium.

The distribution of funds will be in line with the above, with a total of €2.65 billion from the Horizon Europe programme and €1.525 billion from the Digital Europe programme.

Section 5.2 – and AESEMI´s proposals.

In relation to the Chips Joint Undertaking, we make the following assessment:

The European Commission's proposal for a Regulation in this area is excessively generic and fails to take into account the particularities of the R&D&I process in the semiconductor industry, which makes it difficult to undertake projects with the current administrative procedures, and therefore the long timeframe for product development in the semiconductor industry, as well as its cost, must be taken into account. If this remains the case, it will not be possible to develop chips with nodes smaller than 65 nm in the calls launched under this programme because their cost would be close to or even higher than the total budget of a consortium.

For this reason, we propose:

1. Reflecting the capabilities of small companies, highlighting that in semiconductors, big innovation is done in small companies.
2. To highlight that devoting the bulk of the budget in the European industrial framework to the 2nm nodes would not be the most advisable thing to do, since in order to meet the objectives of guaranteeing supply, the budget should be focused on providing supply with

mature technologies, which are those that are eminently used in the Community's industrial fabric.

3. Allow the cost of developing a chip or other semiconductor industry-related product (packaging, assembly, semiconductor manufacturing equipment) in a European programme to get extra funding from the Chip Joint Undertaking. Or ensure that this is at least partially funded.
4. In calls where costs are not 100% funded, allow full funding of costs related to semiconductor product development.

5. Conclusions.

As it has been esposed throughout the document, AESEMI's general assessment of the Chips Act package is eminently positive, given that it provides the sector with its own regulatory framework and specific mechanisms for dealing with supply crisis situations, as well as creating specific structures to guide and channel the large amounts of investment that have been planned by the European Commission.

However, it is worth making some general comments on the proposed package, given that the objectives set out in terms of guaranteeing supply and strengthening the Community's industrial fabric will be unattainable if certain aspects of the Chips Act are not redirected. Following on from what has been said previously throughout the document, and without being exhaustive in nature, our fundamental proposals are set out below in the form of three essential commitments:

- **The European Union should make a clear and decisive commitment to boosting the capabilities of its native fabric,** rather than encouraging large companies in the sector to deploy production facilities, so that investments and incentives are targeted at companies in the semiconductor value chain that have emerged from the Member States themselves. Such an approach would maximize the benefit especially for small and medium-sized enterprises, as they would be provided with many more capacities and tools to enhance their activity. This issue is further elaborated in the series of proposals made in section 4.2 on the assessment of the proposed Chips Act Regulation, with particular consideration of sections 4.2.1 and 4.2.3**.**

- **The European Union must ensure that all the assets resulting from the major investment processes provided for in the regulations (assisted design tools, virtual platforms, etc.) are aligned with international manufacturing** standards and processes, otherwise the EU would be turning into a technological silo which, rather than being autonomous, would be isolated from the rest of the semiconductor production clusters. The proposals relating to this section are reflected in section 4.2.3, which sets out the specific problems that may arise if there is no good basic approach to the development of these systems.

- In order to achieve the production targets that have been set out in the regulations and the capacities relating to the guarantee of supply, it is necessary to match the incentive technologies and investment areas with the real needs of our industry, and not to promote the development of technologies that will only be used by non-EU manufacturers. This is particularly evident when it is proposed to promote the development of semiconductors of less than 2nm, when European industry, due to its technological needs, is leveraged on 65nm semiconductors; or when it is proposed in the text that foundries recognized as being of public utility, in order to speed up the processing of their installation, can only be so recognized if they address cutting-edge technologies. The proposals in sections 4.2.4 to 4.2.7, which aim to promote the capacities of the real industrial fabric within the framework of the European Union, address these problems.