European Semiconductor Industry Association

POSITION PAPER

EU Chips Act 2: Europe's path towards semiconductor leadership

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Summary

- Semiconductors (or 'chips') are a pervasive technology; key components of everyday electronic devices that make life easier, safer, more secure, and greener. Semiconductors are a common denominator for achieving European ambitions across the board, from the green to digital transitions.
- Europe is home to leading semiconductor manufacturers, like integrated device manufacturers (IDMs) and (specialty) foundries, equipment manufacturers, and material providers as well as research & technology organisations (RTOs).
- Europe is strong in key industry verticals: automotive, industrial, Internet of Things (IoT), power, smart home, and medical applications.
- The revision of the EU Chips Act is an opportunity to further improve the legal framework and strengthen the semiconductor industry in Europe. It should focus on aligning with industry, end-market realities, and strengthening Europe's position in the global value chain.
- It will be of utmost importance to set a clear focus on industrial deployment when revising the research dimension of the EU Chips Act. Today's research should be aimed at winning tomorrow's markets.
- The revision should focus on conditions to innovate across all segments of the supply and value chains and strengthen the industrial innovation infrastructure. Cooperation with industry verticals should be strengthened and significantly expanded.
- It will be of utmost importance to address areas of artificial intelligence (AI) where mastering future breakthrough innovations will lead to a world-leading position of the semiconductor industry in Europe. A two-pronged approach targeting foundational chips for AI and European leading-edge chips for AI should be developed.

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- The existing funding toolbox for supporting semiconductor projects demands an improvement. A semiconductor budget for highly strategic projects should be established, underpinned with fast decision making processes, flexible eligibility, ambitious budgets, and funding rates similar to many examples in other regions of the world.
- The scope of 'first-of-a-kind' (FOAK) should be redefined to support the market needs of the upstream chip value chain, and expanded. This should encompass relevant strategical suppliers and equipment makers, as well as joint ventures with end-users across strategic application sectors.
- An institutionalised high-level dialogue between policymakers and the semiconductor industry in Europe must be set up to address Europe's competitiveness gap, focus on areas of European strength, and identify areas of critical and strategic technologies where Europe has the capacity to lead.
- Simplified administrative and regulatory rules should be implemented to empower companies to innovate and seize market opportunities and create a positive business environment to ensure fair competition among the different regions in the world.

I. State of play: The semiconductor industry in Europe

Semiconductors are vital to Europe's future, driving innovation and creating value across sectors like automotive, industrial, AI, aerospace, defense, med-tech, and clean energy. Semiconductors are foundational technologies for, among others, cars, smartphones, connected wearables, wind turbines, and industrial robots, and are thus key enablers of the green and digital transitions. The pervasive and multiplying effect of semiconductors fuels value creation across the entire ecosystem in Europe. Yet, most demand growth and innovation stimuli are happening outside of Europe. The semiconductor industry in Europe is facing fierce global competition which is characterised by high levels of public investment and involvement.

Hence, strengthening the semiconductor sector in Europe is essential to unlock long-term value, growth, and competitiveness. Europe is home to leading semiconductor manufacturers, like IDMs and (specialty) foundries, equipment manufacturers, material providers, and RTOs. Semiconductor technologies developed and manufactured in Europe include sensors, microelectromechanical systems (MEMS), security chips, microcontrollers, microprocessors, power semiconductors, and silicon photonics, to name a few. Global markets and critical applications depend on semiconductor technologies coming from Europe. They enable cutting-edge innovations at the heart of products for Europe's strongest industry verticals and supply chain:

- Automotive applications require functional, safe, and secure advanced sensing and processing capabilities, including embedded AI for autonomous driving.
- Industrial automation relies on safe, secure motor control and connectivity technology, enabling robotics with machine learning capabilities.
- Smart home / health applications need low-power, cybersecure solutions for domestic appliance consumer devices and (remote) health monitoring equipment.

- Data centres, energy grids, and electric vehicle charging infrastructure require large power conversion and management solutions enabled by highly energy-efficient chips.
- Aerospace and defence need reliable, powerful, secure, and innovative chip solutions.
- Secure semiconductors for critical applications in bank and ID sectors are enabled by smart and trusted chips.
- Medical devices need semiconductors that power everything from imaging systems to implantable devices.
- Lithography equipment requires advanced semiconductors for the manufacturing of foundational and leading edge chips.

The EU Chips Act has been fundamental in strengthening the semiconductor ecosystem in Europe by reinforcing capabilities in research and spurring manufacturing capacity. It has enabled public-private investments in the semiconductor industry in Europe and helped increase supply resilience.

II. Industry recommendations for the EU Chips Act 2

The semiconductor industry is inherently global, with deep interdependencies across regions; however, strong European technology and trading positions can and should be built. The industry's integrated, winner-takes-all value chain offers Europe a chance to secure its relevance and capture value. To do so, Europe must act swiftly, leverage its strengths, and align with market trends and demands. A revised EU Chips Act should focus on expanding the industry to meet Europe's demand while reinforcing its position in the global value chain.

The evaluation and revision of the EU Chips Act, as rightly called for in, among others, Mario Draghi's report "*The Future of European Competitiveness*"[1] and in the Mission Letter to Executive Vice-President Henna Virkkunen is an opportunity to further improve the legal framework and strengthen the semiconductor industry in Europe. The recent European Court of Auditors Report[2] reviewing the progress of the EU Chips Act indicated clearly that the Act was generally a success, but is not sufficient to meet its ambitions. Furthermore, a group of Member States founded the 'Semicon Coalition', seeking strong cooperation and fast-track action from the European Commission to address the semiconductor industry as a strategic asset and necessity for Europe's competitiveness, resilience, and strategic autonomy.

The revision should move away from arbitrary, overly ambitious political targets, such as achieving specific marketshare milestones (i.e., 20% of global production capacity), which do not reflect industry needs or capabilities. Instead, it should focus on aligning with industry and end-market realities, and strengthening Europe's position in the global value chain, rather than pursuing isolated goals. Against this backdrop, ESIA presents its recommendations for the EU Chips Act 2.

Innovation focusing on industrial deployment

It will be of utmost importance to set a **clear focus on industrial deployment** when revising the research dimension of the EU Chips Act. Industry's role in research must be strengthened

in order to reach the 'lab-to-fab' objective – i.e., today's pilot lines – and bridge the gap between research and the market across all technology nodes, including leading-edge processes. Hence, the Chips Joint Undertaking (Chips JU) shall be continued, expanded and enhanced under the EU Chips Act 2. Today's research should be aimed at winning tomorrow's markets.

Key to innovation is also strenghtening Europe's existing research and development (R&D) hubs. The EU should use the revision to push for coordination amongst Member States that include R&D partnerships. Coordinated efforts among Member States should include both focus on creating education programmes to address talent gaps in key industries, as well as efforts to encourage knowledge-sharing across Member States. This is particularly important in the semiconductor sector which is a critical industry with notably high R&D intensities compared to other industries and crucial for Europe's industrial growth.

Priorities must be closely elaborated with the semiconductor ecosystem in Europe. In order to **unleash the innovation potential** of the semiconductor industry in Europe, initiatives under an EU Chips Act 2 must **include the entire semiconductor value chain**, including IDMs, RTOs, foundries, fabless companies, (advanced) material suppliers, equipment manufacturers, and the printed circuit board (PCB) industry.

The revision should focus on conditions to innovate across all these segments of the supply and value chains and strengthen the industrial innovation infrastructure. Cooperation with industry verticals must also be strengthened and significantly expanded, in order to closely align with end-user industries on demand and market needs. **Dedicated innovation centres** should be supported making such cooperation a reality and driving innovative product breakthroughs. The EU Chips Act 2 should make explicit competitive conditions to help the semiconductor industry in Europe thrive by jointly innovating and driving demand.

Focus on EU's unique strengths in AI

Recent calls for a revision of the EU Chips Act, such as in the Communication of the EU AI Continent Action Plan, put emphasis on Europe's need to strengthen the design and manufacturing of chips for AI. It will be of utmost importance to address areas of AI where mastering future breakthrough innovations will lead to a world-leading position of the semiconductor industry in Europe.

Therefore, ESIA calls for a two-pronged approach targeting foundational chips for AI and European leading-edge chips for AI.

First, on **foundational chips for AI**, Europe should ensure securing a leadership position in the next wave of AI innovation, in particular **Edge AI**, also referred to as Physical AI. It refers to AI computation being done directly on sensor systems or IoT devices, i.e., near the user or 'at the edge' of the network, rather than relying on cloud computing or private data centres. Edge AI allows for real-time data processing, analysis, and decisionmaking directly on smart connected devices at a time when latency and data security pose increasing challenges for an ever more ubiquitous technology. It will be a key prerequisite for winning the next global technology race in intelligent systems and robotics, and Europe already has a pole position in necessary key components such as microcontrollers and smart sensors. The approach should also include **powering AI**, addressing the growing electricity demand and need for energy

efficiencies to reduce the overall power consumption of AI server systems and data centres. To promote foundational chips for AI in Europe, the EU Chips Act 2 should contain fit-for-purpose instruments enabling the semiconductor ecosystem in Europe to become global leaders.

Secondly, an approach to drive European **leading-edge chips for AI** should be developed to ensure Europe's leadership position in research, manufacturing processes, and semiconductor manufacturing equipment. It should also identify and address technology gaps and include a concept to increase Europe's tech sovereignty, in close alignment with the industry.

In addition, the EU Chips Act 2 should also address next generation disruptive technologies, such as quantum technologies and neuromorphic computing, and build a competitive position in next-generation AI solutions. Furthermore, the EU Chips Act 2 could accelerate international partnerships with research and industrial players globally (including advanced economies and developing countries), with the aim of securing access to knowledge in the areas where Europe is not strong today.

Fit-for-purpose instruments for technology leadership and indispensability

To ensure Europe's technological leadership, ESIA is convinced that a strategic shift in holistically supporting critical semiconductor research, development, and manufacturing under the EU Chips Act 2 is required. A healthy and flourishing research and product development capacity and capability underpins any competitive manufacturing position. Only focusing on research and manufacturing alone is not enough, the whole process needs to be supported operationally and through infrastructure.

ESIA believes that the existing funding **toolbox** for supporting highly strategic semiconductor projects demands an improvement. To meet Europe's technology leadership, suitable instruments are urgently needed to underpin these objectives.

The changing geopolitical environment and ever shorter innovation cycles, accelerating the global race for technology leadership, require fit-for-purpose, agile instruments allowing for flexibility, speed, and an ambitious industrialisation path.

Today, the toolbox consists of **pre-competitive** research and development programmes such as the Chips JU as well as the **state aid** frameworks, Important Projects of Common European Interest (IPCEIs), and the EU Chips Act. The Chips JU is very strongly focused on research. The two IPCEIs on microelectronics have allowed for the *ad hoc* implementation of research & development & innovation (R&D&I) projects of major innovative nature. The EU Chips Act's FOAK framework did attract investments into chip manufacturing projects and capacity building. Even though successful within their specific scopes, the existing instruments are narrowly tailored, scattered, and not always adequately adopted by Member States.

Consequently, ESIA calls for the creation of an **EU budget for semiconductors**, as Mr Draghi also recommended. Such a budget would complement and stimulate national funding, i.e., provided as "*top ups*" in IPCEIs and EU Chips Act FOAK projects (as currently proposed in Article 19 of the European Competitiveness Fund, at least for IPCEIs). The EU budget for semiconductors should be considered under the upcoming European Competitiveness Fund (ECF) to enable fast funding for highly strategic projects, including joint ventures, relevant to Europe's technology leadership and indispensability in semiconductors. Such projects require fast decisionmaking, centralided at EU-level as one single competent authority instead of a

lengthy process between the EU and Member States. They also require flexible eligibility, ambitious budgets, and funding rates similar to many examples in other regions of the world.

ESIA calls for the following funding structure under a revised EU Chips Act:

(1) Continuation and expansion of the Chips JU reflecting the priorities of Europe's world-leading semiconductor ecosystem to keep their globally leading position.

(2) Creation of a new EU semiconductor budget under the ECF, focusing on strategic priorities where EU's industry can gain significant market share within the next three to eight years, in areas indispensable for its strategic autonomy.

(3) Continuation of the FOAK concept under Pillar II of the EU Chips Act, to create the industrial outlet for products developed under (1) and (2).

More flexible scope of FOAK

To maximise the impact of the EU Chips Act 2 and bolster Europe's semiconductor ecosystem, the scope of FOAK projects should be broadened. These projects play a crucial role in strengthening Europe's semiconductor capabilities and resilience in the face of global supply chain disruptions. FOAK projects should be considered a strategic industrial policy vehicle.

To achieve this, a wider range of actors in the value chain must be included. This should encompass not only chip manufacturers, but also relevant strategical suppliers, equipment makers, as well as joint ventures with end-users across strategic application sectors and start-ups, ensuring a **more integrated and comprehensive approach** to the semiconductor ecosystem in Europe. Furthermore, also research and product development facilities should be included, as in many areas sustaining the European lead in R&D requires substantive capital expenditures.

Institutionalised cooperation with industry

The EU Chips Act established the European Semiconductor Board (ESB), which has not entirely met its goals yet. The urgently needed high-level industry body to advise the ESB has not yet been implemented. This means that the advisory function of the Industrial Alliance for Processors and Semiconductor Technologies – the importance of which was emphasised several times in the Chips Act – has so far been weak, almost non-existent. Hence, ESIA strongly recommends establishing a **regular and institutionalised high-level dialogue** between policymakers and the semiconductor industry in Europe to address Europe's competitiveness gap, focus on areas of European strength and identify areas of critical and strategic technologies where Europe has the capacity to contribute to global value chains. Industry is at the frontline in participating in global competition and has a depth of understanding of global value chains that is critical to constructive and action-oriented discussion on formulating policy that can best support European competitiveness.

Such a dialogue must involve key stakeholders representing the semiconductor ecosystem in Europe and be embedded in the revised governance framework of the EU Chips Act 2, ensuring timely and targeted policy initiatives. Such a collaborative approach will be crucial to develop and execute a resilient, competitive, and innovation-driven European semiconductor strategy.

Streamlining and simplification of administrative procedures

Creating a positive business environment through the reduction of bureaucracy and complexity is a prerequisite for Europe's competitiveness. Long permitting approval times for private and publicly funded projects under the EU Chips Act's Pillar II remain a competitive disadvantage compared to other regions. In the semiconductor industry, which is characterised by ever shorter innovation cycles, these bureaucratic hurdles risk delaying innovation and manufacturing projects by years, meaning the loss of competitive edge.

Moreover, administrative procedures for all investments, and in particular for FOAK facilities, need to be more transparent, simpler to access, faster to process, and implemented more swiftly. Furthermore, clear timelines for, *inter alia* permitting, are necessary. The Net-Zero Industry Act[3] is a good example for clarity in this context, where Articles 9 and 16 provide explicit timelines for permit-granting procedures. This allows for long-term planning and legal certainty for companies.

III. Conclusion

Semiconductors are of true strategic importance and indispensable to Europe's industrial success, the green and digital transition, as well as Europe's resilience, technological sovereignty, security, and critical infrastructure.

It is essential to develop an EU Chips Act 2, underpinned by competitiveness and capitalising on the multiplying effect of semiconductors, which fosters innovation, proposes measures to increase demand, defines clear priorities for semiconductor research, development, manufacturing, and provides additional, focused public funding instruments.

Initiatives addressing the development of chips for AI must leverage Europe's unique capabilities which are indispensable for winning the next wave of AI innovation and provide an exceptional chance for global leadership.

The priorities must be jointly developed with the semiconductor ecosystem in Europe, in close alignment with end-user industries – i.e., industry verticals and enabling technologies – and policymakers. Administrative procedures, such as approval processes, including for expanded FOAKs, must be simplified.

A globally competitive semiconductor industry in Europe is a key prerequisite for a stronger and more resilient Europe. ESIA stands ready to work with the European Commission, European Parliament, and Member States to achieve these goals.

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 one of the most R&D-intensive sectors by the European Commission, the European semiconductor ecosystem supports approx. 200.000 jobs directly and up to 1.000.000 jobs indirectly 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.

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[1] Report on "The future of European Competitiveness", by Mario Draghi (last retrieved 25.07.2025).
[2] European Court of Auditors Report, last retrieved (25.07.2025).
[3] Net-Zero Industry Act, EUR-lex: OJ L, 2024/1735, 28.6.2024 (last retrieved 25.07.2025).