BRIEFING
EU Legislation in Progress

European Parliament

The EU chips act

Securing Europe's supply of semiconductors

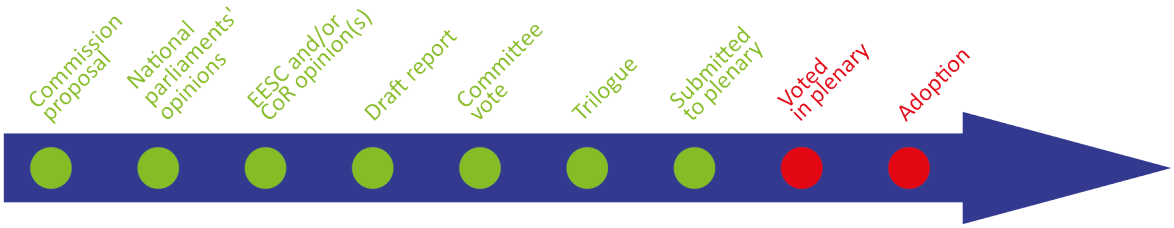
OVERVIEW

Semiconductors (or chips) are the foundation of the digital transition. Their production relies on complex and vulnerable global supply chains. Against the backdrop of global chip shortages, a global 'subsidy race' in the world's main producing regions, and the renewed EU industrial policy, the Commission presented a proposal for an EU chips act aimed at reinforcing the whole EU chips value chain in February 2022.

The proposal for a chips act was based on a three-pillar structure, which has been retained by the co-legislators: pillar 1 to bolster large-scale technological capacity building and innovation in the EU chips ecosystem; pillar 2 to improve the EU's security of supply; and pillar 3 to set up a monitoring and crisis response mechanism. In the event of supply crises, the Commission would be allowed to implement three types of emergency measure: asking companies for information, asking companies to accept and prioritise orders of crisis-relevant products, and making shared purchases on behalf of Member States.

Following provisional political agreement reached between the co-legislators on 18 April 2023, 14 months after the publication of the Commission proposal, and after four trilogues, the Parliament is expected to adopt its position at first reading during its July 2023 plenary session.

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)		
Committee responsible:	Industry, Research and Energy (ITRE)	COM(2022) 46 8.2.2022
Rapporteur:	Dan Nica (S&D, Romania)	
Shadow rapporteurs:	Eva Maydell (EPP, Bulgaria) Bart Groothuis (Renew, the Netherlands) Henrike Hahn (Greens/EFA, Germany) Johan Nissinen (ECR, Sweden) Marie Dauchy (ID, France) Marc Botenga (The Left, Belgium)	2022/0032(COD) Ordinary legislative procedure (COD) (Parliament and Council on equal footing – formerly 'co-decision')
Next steps expected:	Vote in plenary	



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Author: Guillaume Ragonnaud
Members' Research Service
PE 733.596 – June 2023

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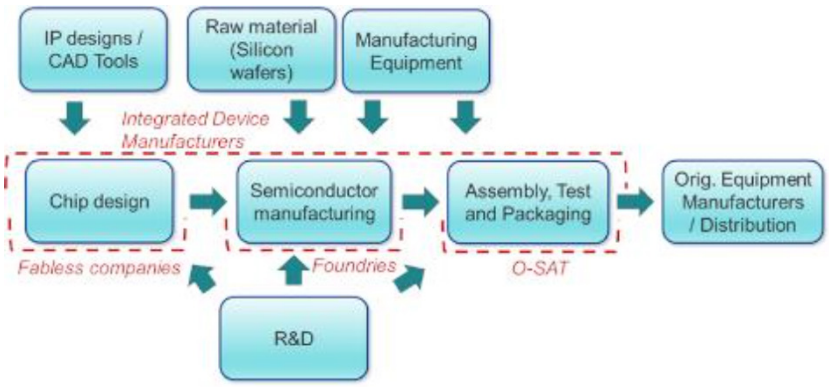
Introduction

'The birth date of the integrated circuit [a.k.a. chip] is one of the most important birth dates in the history of technology' – Prof. T. Claeson, presentation speech for the 2000 Nobel Prize in Physics.

The early developments of microelectronics were hailed by the award of the **Nobel Prize** in physics in 1956 to Shockley, Bardeen and Brattain for their research on semiconductors and their discovery of the **transistor** effect in 1947 (today, there are billions of transistors in any cutting-edge chip); and in 2000 to Kilby for his part in the invention of the **integrated circuit (or chip)** in 1958, a 'vital component in computers and other electronic equipment'. Semiconductors are also known as 'integrated circuits' or 'chips'. Like the steam engine, chips are one of the few 'general purpose technologies', i.e. breakthrough innovations that have opened up whole eras of technical progress and economic growth. Used in an impressive range of products, from computers to medical devices, in 5G and artificial intelligence systems, and in security and defence devices, chips have become ubiquitous. Chips are the **engines of the digital transition**.

In 2021, the semiconductor industry surpassed the **trillion chips mark** for the first time, with its output reaching 1.1 trillion chips (i.e. around 140 per person on Earth). The same year, the global chip market totalled US$614 billion (+25 % compared to 2020) and is expected to reach US$681 billion in 2022. Furthermore, the value or content of semiconductors used in electronic systems reached a record high of 33 % in 2021, compared to 26 % in 2010 and 22.5 % in 2000. A smartphone incorporates around 160 different chips, hybrid electric cars up to 3 500. The chips market is expected to continue growing, with market analysts estimating that the market could reach around US$700 billion by 2025 and US$1 trillion **in 2030**.

Figure 1 – The semiconductor value chain



Source: European Commission, SWD(2021)352. CAD: computer assisted design. IP designs: intellectual property designs (reusable components designs or 'IP blocks'). O-SAT: outsourced assembly and test firms.

The production of semiconductors involves some of the **most complex technologies** invented by humankind. Chips rely on patterns that are printed on ultra-pure semiconducting materials at the nanometre scale (i.e. one billionth of a metre), which is close to the **atomic scale**. The manufacturing of chips involves three main steps: **chip design; production** (in 'foundries' or 'fabs'), the most capital-intensive stage; and **final assembly, testing and packaging** (ATP), the most labour-intensive stage. Producing a chip from a silicon wafer involves hundreds of steps in cleanrooms, where the air is 10 000 times cleaner than outside. Chips production also relies on around 300 inputs (such as some specific chemicals), and on more than **50 classes of high-tech manufacturing equipment** (such as equipment for extreme ultraviolet lithography). The three main categories of semiconductors are: **logic** chips – the 'brains' of electronic devices, executing complex computing operations; **memory** chips, storing information; and **discrete, analog and other** chips (DAO), such as voltage regulators or optical sensors. Advances in chip manufacturing process technology are typically described as **nodes** – referring to the **size** in nanometres (nm) of the **transistor gates** (the key components of chips). The most advanced chips are based on the smallest nodes (below 10 nm) and consist of tens of billions of transistors.

Context

Strikingly, semiconductors **link the atomic-scale world with the current global geopolitical challenges**. This was made particularly obvious following the outbreak of the COVID-19 pandemic, which emphasised long-standing vulnerabilities in the **semiconductor supply chain**. It has been affected by unprecedented **shortages** since late 2020, impacting negatively on large parts of the industry and slowing down the pace of recovery.

The **extreme complexity of the global supply chain** exposes it to a wide range of potential **disruptions**. This is due to a high level of **geographic concentration** and **specialisation**, the **interdependence** of the actors involved, and the **capital-intensive** nature of the industry (a fab for advanced logic and memory chips costs around US$20 billion). A large semiconductor firm may rely on as many as **16 000 suppliers** worldwide. The global supply chain comprises more than 50 choke points – steps where one region holds more than 65 % of the global market share. Disruptions may be caused by natural disasters, accidents, infrastructure failures, cyberattacks and geopolitical tensions. The fragility of the chips supply chain puts potentially every sector of the EU economy at risk of disruption, threatening in particular the EU's ability to reap the benefits of the digital transition and to ensure its digital sovereignty.

Furthermore, recent developments have triggered **additional concerns** for the chips sector. The **war in Ukraine** could jeopardise the supply of semiconductor-grade **neon** – a key gas used in chip lithography; around half of the global supply of neon was provided by two Ukrainian firms, which had to shut down production in Mariupol and Odessa. In June 2022, Russia restricted exports of helium and neon sourced by chip firms. Faced with supply disruption and price increases, TSMC, the world's leading semiconductor producer, explained in November 2022 that it was aiming to secure sources of neon gas from Taiwan within three to five years.

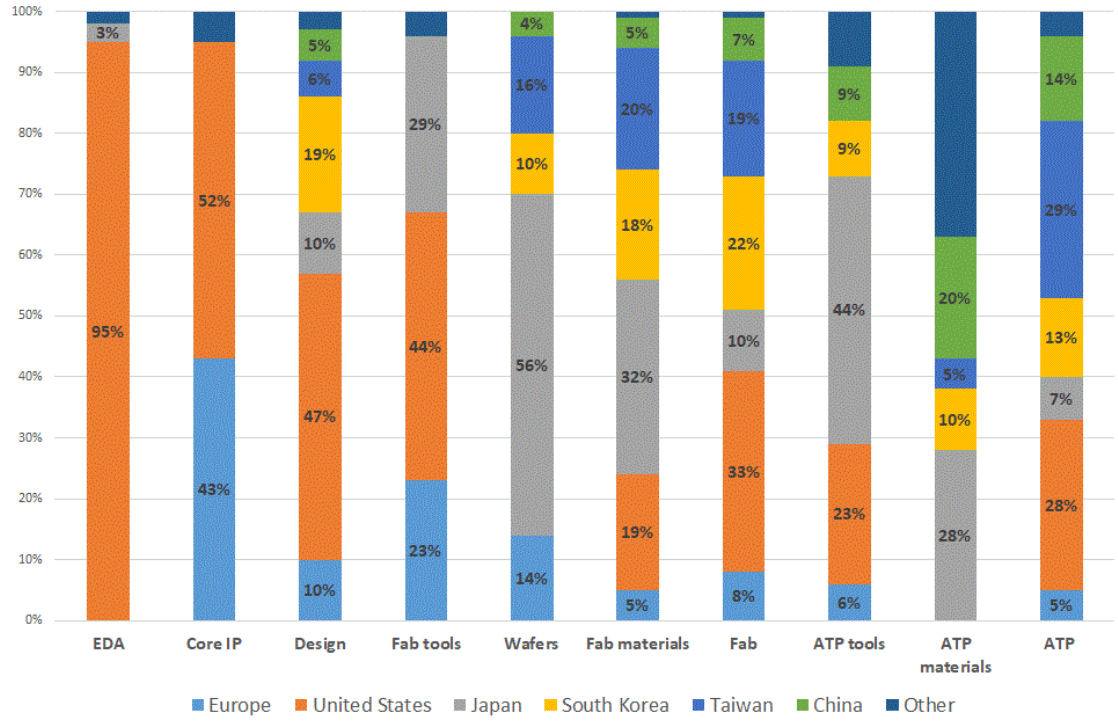
Existing situation

The **share of Europe** in global fabrication capacity is **below 10 %**. For advanced technologies (the 7- and 5-nm nodes), 100 % of global capacity is based in east Asia (Taiwan and South Korea). Only TSMC (Taiwan) and Samsung (South Korea) are able to manufacture chips at 5nm, and the global economy relies on Taiwan for 92 % of the production of these chips. In **2013**, the Commission adopted a European strategy for micro- and nanoelectronic components and systems; its objective was to **reverse the decline of the EU's share of world supply**. However, the Commission itself has recognised that the strategy has **failed**. Furthermore, along the chips supply chain, Europe has a strong position in some segments (e.g. in the provision of core intellectual property (IP) blocks and fabrication tools), but lags behind in many other segments (Figure 2). The EU has notable weaknesses in design and design automation tools, all vendors of the software used to design chips being based in the United States. Moreover, most of the companies that are active in the assembly, packaging and testing segment are based in Asia. In 2018, around 219 000 people were employed in the manufacturing of electronic components in the EU, with an annual growth rate of 3 % over the 2012-2018 period. The EU microelectronics sector, including design and production of components, materials and equipment, is directly responsible for 455 000 high-skilled jobs. Moreover, as an enabling sector for the entire electronics value chain, from materials to systems, it accounts for **2.6 million jobs** in total. For each worker employed by the semiconductor industry, an additional 5.7 jobs are supported in other sectors of the economy.

The development and production of semiconductor components in the EU is concentrated mainly in **Germany, France, Italy, the Netherlands, Austria, Belgium and Ireland**. EU companies supply the automotive, industrial automation, security and healthcare sectors, as well as aeronautics, energy production and telecommunications, with significant market shares in some industries (Figure 3). In December **2018**, the Commission approved an important project of common European interest (IPCEI), involving five Member States until 2024, to support the development of innovative

microelectronics (such as energy efficient chips) with €1.75 billion from Member States and €6 billion from the private sector. Furthermore, in December **2021** a new IPCEI on microelectronics was put forward by Germany on behalf of 20 Member States, in the context of the EU's recovery plan. This IPCEI is intended to support investment in industrial capacity at all the choke points in the supply chain. It has not yet been approved by the Commission.

Figure 2 – Global market shares in the different segments along the chips value chain



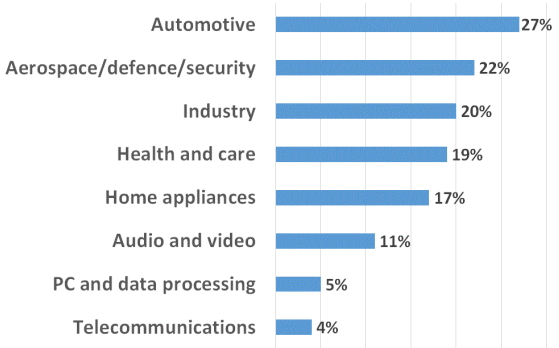
Source of data: Kearney, 2021. EDA: electronic design automation. Core IP: core intellectual property blocks. ATP: assembly, testing, and packaging.

Comparative elements[1]

While EU policies supporting the semiconductors sector have remained modest (and mainly focused on research), government support to the chips industry is widespread worldwide (and sometimes referred to as a 'subsidy race'). It comprises support provided through government budgets (e.g. grants and tax concessions, mainly for R&D activities), but also that provided by state-owned enterprises through the financial system in the form of below-market borrowing and below-market equity (mostly in China). **China**'s 2015 plan 'Made in China 2025' set the aim of producing 70 % of the country's chip consumption by 2025; between 2015 and 2025, Chinese government support to its domestic chip industry could reach US$200 billion.

In the **United States**, the Biden administration has identified semiconductors as a critical good and has urged Congress to pass legislation supporting additional domestic investment in the industry. In August 2022, President Biden signed into law a US$52.7 billion 'CHIPS (Creating Helpful Incentives to Produce Semiconductors) and Science Act'.

Figure 3 – Europe's market shares in chips production for different sectors



Source of data: European Commission, SWD(2022)147.

US$39 billion is allocated for manufacturing incentives (US$2 billion of which for the production of 'legacy chips' (i.e. based on larger transistors) used in the car and defence industries); US$13.2 billion for research and development, and workforce development (the President's Council of Advisors on Science and Technology (PCAST) put forward 10 recommendations to foster the country's chip R&D ecosystem using these funds); and US$500 million for chip supply chain activities and information and communications technology security. The Act also provides a 25 % investment tax credit for capital expenses for manufacturing of chips and related equipment (corresponding to US$24.3 billion). The beneficiaries of CHIPS Act funds will be required to demonstrate significant worker investments and ensure well-paid jobs, and will not be allowed to build certain facilities in China or certain other countries. For 2023 alone, the CHIPS Act will add US$5.5 billion to public investment in chip R&D. Furthermore, since September 2022, exports to China of some Nvidia and AMD advanced chips used by artificial intelligence systems have been restricted. In October 2022, the US government introduced wide-ranging export controls aimed at slowing the progress of Chinese military programmes. Exports of leading-edge chips and critical chip manufacturing tools and technologies to China are not allowed. US citizens and companies are prohibited from supporting Chinese companies involved in advanced chip manufacturing. All companies worldwide are prohibited from supplying certain Chinese entities with hardware or software whose supply chain contains American technology.

Japan, the world leader in chip technologies in the late 1980s, introduced a new growth strategy in 2021, focusing on strengthening its semiconductor industry. In June 2021, the Ministry of Economy, Trade and Industry (METI) adopted a strategy for semiconductors and the digital industry, promoting the manufacturing of cutting-edge (and next generation) logic semiconductors, strengthening design and technological development of cutting-edge logic semiconductors for post-5G technologies, and develop manufacturing equipment and materials that will support the global chip ecosystem and supply chain. The Japanese budget for 2021 included US$6.8 billion for domestic semiconductor investment. In May 2022, Japan and the US agreed to set up a joint task force on next generation semiconductors, based on some basic principles adopted under the Japan-US Commercial and Industrial Partnership (JUCIP). The Japanese government will contribute US$3.5 billion to a US$8.6 billion investment by TSMC in a new chip manufacturing plant. In 2022, Japan subsidised Micron (US$320 million) and Western Digital (US$644 million) to increase their chip production in the country. In July 2022, Japan and the US agreed to set up a new joint research centre for next-generation semiconductors. It will aim to develop faster and more power-efficient semiconductors at the 2nm node. Japan plans to establish the centre by the end of 2022. In November 2022, Japan announced that it would invest around US$500 million in a new chip company (Rapidus), together with companies such as Sony, Toyota and IBM. It aims to start producing next generation chips (under 2 nm) in the second half of the decade.

In May 2021, **South Korea** unveiled plans to spend around US$450 billion up to 2030 to reinforce its chips industry. Tax breaks, lower interest rates, eased regulations and reinforced infrastructure, secured water supply for the next 10 years and reinforced power supplies were among the announced measures. South Korea wants to attract more foreign investment and is seeking to build a 'K-semiconductor belt' stretching south of Seoul, bringing together chip designers, manufacturers and suppliers. It is estimated that South Korea's subsidies reduce the cost of facility ownership by around 25 to 30 %. In June 2022, Trade, Industry and Energy Minister Lee Chang-yang announced that new measures to develop the industry would be presented at a later stage.

Taiwan provides subsidies for fabrication facilities, including 50 % for land estate costs, and 45 % for construction and facilities, in addition to R&D investments and other incentives. It is estimated that incentives reduce the total cost of owning a chip fab by approximately 25 to 30 %. In June 2020, Taiwan announced a US$1.3 billion annual fund to attract foreign companies to establish chip R&D projects, subsidising up to 50 % of all R&D costs incurred. It announced that it would invest US$335 million to incentivise foreign companies to establish chip R&D facilities in Taiwan. In 2021, 39 fab construction or extension projects were announced worldwide (four of them in the EU).

Parliament's starting position

In its resolution of 7 July 2021 on the trade-related aspects and implications of COVID-19, Parliament called for a dialogue on semiconductors to be started with Taiwan. In its resolution of 16 September 2021 on a new EU-China strategy, Parliament recalled the importance of trade and economic relations between the EU and Taiwan on chips. Parliament pointed to the need to invest in research and innovation, and to develop a competitive and sovereign industrial strategy in semiconductor production to decrease the EU's reliance on China. For Parliament, better coordination of these policies with those of other like-minded liberal democracies should be sought. Furthermore, in its resolution of 9 March 2022 on foreign interference in all democratic processes in the EU, Parliament stressed that the EU's lack of investment in technology has contributed to its current dependence on foreign suppliers. Parliament considers that the chips act represents an important step in limiting dependence on third countries such as China and the United States. It also believes that investment in chip production must be coordinated across the EU and on the basis of a demand-side analysis, in order to avoid a race to national public subsidies and fragmentation of the single market. Furthermore, Parliament called on the Commission to set up a dedicated European semiconductor fund. This fund could foster a skilled workforce and offset the higher setting-up costs of manufacturing and design facilities in the EU. Parliament also reiterated that it considers Taiwan to be an important partner in boosting the production of chips within the EU.

Council and European Council starting position

In December 2020, 22 Member States adopted a joint declaration on processors and semiconductor technologies. They agreed to work towards strengthening the semiconductor ecosystem and the supply chain, in order to address key technological, security and societal challenges. The signatories also agreed to build on and reinforce the EU's strengths, and aim to set up advanced EU chip design capabilities and production facilities for cutting-edge nodes.

To avoid supply shortages that could jeopardise the EU's digital transformation, the European Council stressed, in its conclusions of October 2021, the need to make rapid progress in fostering the setting-up of a cutting-edge EU chip ecosystem and to improve its resilience, including concerning the supply of raw materials. The European Council looked forward to the upcoming proposal on the European chips act. In March 2022, EU leaders adopted the Versailles declaration, highlighting that reducing the EU's strategic dependencies in semiconductors was key to building a strong economic base. To this end, the European Council stressed the need to diversify chips supply value-chains, maintain technological leadership and enhance EU production capacity in order to secure, through the chips act, 20 % of global market share by 2030.

Preparation of the proposal

On 10 March 2020, the Commission adopted a new industrial strategy setting a 'new industrial way for Europe'. The strategy aims to reinforce Europe's industrial and strategic autonomy, for instance by reducing the EU's dependence on critical technologies, such as microelectronics (one of the 'key enabling technologies' that are strategically important for the EU's industrial future). The electronics ecosystem is among the 14 key industrial ecosystems identified in the strategy for close monitoring by the Commission. The May 2021 update of the strategy pointed to the need to address strategic dependencies. Concerning semiconductors, it points out that the EU chips supply chain is increasingly vulnerable due to high entry cost, large subsidies in producing countries, escalating trade tensions, dependence on Asia for advanced chip manufacturing and on the United States for chip design tools. It concluded that the EU needs to strengthen its own industry to minimise risks.

In its communication of 9 March 2021 entitled '2030 digital compass: the European way for the digital decade', the Commission proposed a target of at least 20 % of world production in value by 2030 for the EU production of cutting-edge and sustainable semiconductors. Furthermore, co-legislators reached a provisional agreement on 14 July 2022 on a proposed decision setting up a

governance framework, cooperation mechanisms and funding to help achieve the 2030 targets. The final agreement was approved by Parliament on 24 November and is still subject to final approval by the Council. Taking into account the projected market size of US$1 trillion by 2030, the EU would have to increase its annual sales by a factor of four or five to achieve this goal.In its communication of November 2021 on a competition policy fit for new challenges, the Commission explained that it may envisage approving public support to fill funding gaps in the chips ecosystem for the setting-up of 'first-of-a-kind' facilities (see the section on pillar 2 of the chips act), based on Article 107(3) TFEU. Such aid would have to be subject to strong safeguards to ensure that it is necessary, appropriate and proportionate, that undue competition distortions are minimised, and that benefits are shared widely and without discrimination across the EU economy. The proposal on a chips act was not accompanied by an impact assessment. Instead, the Commission published a staff working document on 11 May 2022.

The changes the proposal would bring

The proposal for a regulation setting up a framework of measures to strengthen Europe's semiconductor ecosystem (the 'chips act') is part of a package put forward by the Commission on 8 February 2022. The chips act is based on a three-pillar structure: **pillar 1**: a 'chips for Europe initiative', aimed at bolstering large-scale technological capacity building and innovation in the EU chips ecosystem; **pillar 2**: security of supply, to support projects aimed at improving the EU's security of supply, by attracting investment and enhancing production capacities; **pillar 3**: monitoring and crisis response, with the possibility for the Commission to implement three kinds of emergency measures (information gathering on the market; oblige some companies to accept and prioritise an order of crisis-relevant products; and carry out common purchasing on behalf of some Member States for the public procurement of some crisis-relevant products.

Advisory committees

The **European Economic and Social Committee** (EESC) appointed Dirk Bergrath (Workers – Group II, Germany) as rapporteur. The EESC opinion was adopted on 15 June 2022. The EESC stressed that the proposal was too focused on next generation chips, and should also target the chip segments that are currently needed in EU industry. More attention should also be paid to the latter stages of the supply chain. On skills, the EESC considers that the proposal is too focused on highly skilled workers, and should put additional emphasis on job access for lower skilled workers and on retraining of workers. The Commission should also define more clearly the situations in which market intervention can be expected. Furthermore, the EESC thinks that the Commission and Member States should consider using strategic stockpiling to ensure security of supply.

The **European Committee of the Regions** (CoR) (Rapporteur: Thomas Schmidt, EPP, Germany) adopted its opinion on 12 October 2022. It includes 27 amendments to the proposed chips act. For the CoR, funding is far too low. It also criticised the re-directing of funds from Horizon Europe and the Digital Europe programme. The CoR argued the chips act should promote the production of chips above 10 nanometres. The CoR argued that local and regional authorities should be given a key role in implementing the chips act. The CoR also called on the Commission, under the first-of-a kind principle, to allow support for the production of chip precursors, such as wafers.

National parliaments

The deadline for the submission of reasoned opinions on grounds of subsidiarity was 25 April 2022. No such opinion was delivered within the time limit.

Stakeholder views[2]

The feedback period on the proposal was open between 14 March and 9 May 2022. The Commission received 219 contributions from stakeholders. The European Semiconductor Industry Association

Recent investments in the EU chip sector

The Commission stressed that, since it had put forward the proposal for a chips act, investment plans in industrial deployment in the chips sector worth between €90 and €100 billion had been announced in the EU, including the second Important Project of Common European Interest in microelectronics under assessment by the Commission since December 2021 (the €100 billion figure was also mentioned by Commissioner Thierry Breton at the 2023 IMEC Technology Forum).

(ESIA), on pillar 1, called on the EU to focus on IP design for the automotive, industrial, telecommunication infrastructure (6G), health, personal electronics and smart home and energy sectors. Furthermore, innovation should be supported across a wide range of technologies, since the concept of 'leading edge' varies strongly based on applications: node shrinkage should not be the only denominator for defining innovation. On pillar 3, ESIA believes the proposed toolbox measures do not reflect the complexity of the chips supply chain, the requirements of users (downstream) and the range of possible reasons behind a shortage. ESIA thinks that the measures proposed would not prevent supply disruptions and in shifting to instruments that could help chip users enhance their security of business continuity. It considers that pillar 3 should be revised entirely. For ASD, the Aerospace and Defence Industries Association of Europe, support for the defence, aeronautics and space ecosystem should be prioritised across all pillars. ASD also stressed that the Commission should clarify the sources of the €43 billion overall that the chips act aims to mobilise, as the financial breakdown remains vague. Digital Europe proposed clarifying the terms and conditions for development of and third-party access to the virtual design platform and to the pilot lines. The eligibility criteria for EU 'first-of-a-kind facility' (FOAK) semiconductor facilities should be more precise. Bruegel stressed that the Commission had not clarified which market failure the chips act was expected to address, or how obtaining a modest market share in cutting-edge logic chips would actually increase the EU''s geostrategic influence. Moreover, Bruegel pointed out that overcapacity may occur in the future for some chips segments.

Legislative process

In Parliament, the Committee on Industry, Research and Energy (ITRE) was responsible for the file, with Dan Nica (S&D, Romania) as rapporteur. The Committees on the Internal Market and Consumer Protection (IMCO) and on Legal Affairs (JURI) were associated under Rule 57, with some shared competences on parts of the proposal. The Committee on Budgets (BUDG) contributed with a 'Rule 56+' opinion. The ITRE report was adopted on 24 January 2023, by 67 votes in favour, 1 against, and 4 abstentions. On 15 February 2023, Parliament approved the ITRE Committee decision to enter into interinstitutional negotiations. Parliament's position is the Committee's report.

The Council adopted its position (''general approach'') on 1 December 2022.

Agreement and main features of the new EU chips act

Provisional political agreement was reached between the co-legislators on 18 April 2023, 14 months after the publication of the Commission proposal, after four trilogues (28 February, 9 and 30 March and 18 April 2023). The provisional agreement was endorsed in Council by the COREPER on 10 May, and in Parliament by the ITRE committee on 23 May 2023, by 60 votes in favour, 1 against, and 2 abstentions. The Parliament is expected to adopt its position at first reading during its July plenary session.

The overall structure proposed by the Commission, based on **three pillars**, has been maintained by the co-legislators. They have introduced provisions specifying two general objectives for the chips act: (i) to support the EU competitiveness and innovation capacity, and the ability of the industry to adjust to structural changes, and (ii) to improve the functioning of the single market, by setting up a uniform legal framework to improve the EU resilience and security of supply of chip technologies. The new Regulation sets up a **European Semiconductor Board** (ESB), to advise and assist the Commission. Composed of representatives from all the Member States, it will be chaired by the

Commission. Only Member States will have voting rights (one per Member State). The Commission will invite a range of stakeholders. The Chair will invite a representative from the **Parliament as a permanent observer**, in particular to meetings concerning monitoring and crisis response.

Pillar 1: A 'chips for Europe initiative'

The new Regulation sets up a 'chips for Europe initiative', to bridge the gap between 'the fab and the lab'. Its general objective is to achieve large-scale technological capacity building and support research and innovation activities throughout the EU chip value chain. The initiative will support actions organised around **five 'operational objectives'**:

- **Operational objective 1: Building up advanced design capacities**. A virtual design platform, available across the EU, will integrate existing and new design facilities with extended libraries and Electronic Design Automation (EDA) tools. Design capabilities will be reinforced by fostering innovation, such as open-source processor architectures, chiplets, programmable chips, new types of memories, processors, accelerators or low power chips.
- **Operational objective 2: Enhancing existing and developing new advanced pilot lines across the EU**, to enable development and deployment of cutting-edge and next generation chip technologies. Actions will aim to prepare the development of future technology nodes, promoting access to pilot lines for experimentation, test, or validation of new design concepts. 'Integrated Production Facilities' and 'Open EU Foundries' (see pillar 2) will have preferential access to the new pilot lines.
- **Operational objective 3: Building advanced capacities for accelerating the development of cutting-edge quantum chips** and associated chip technologies. Action will support the development of design libraries for such chips and of pilot lines, clean rooms and foundries for prototyping and producing quantum chips and foster the development of facilities for testing and validating advanced quantum chips produced by the pilot lines.
- **Operational objective 4: Setting up a network of competence centres across the EU** by enhancing existing or creating new facilities. This network will strengthen capacities and provide a range of expertise to the stakeholders. Action will also address the knowledge and skills shortage and mismatch. The network will be composed of the competence centres selected by the Chips Joint Undertaking.
- **Operational objective 5: 'Chips fund activities', facilitating access to debt financing and equity**, particularly for start-ups, scale-ups, SMEs and small mid-caps, through a blending facility under the InvestEU Fund and via the European Innovation Council. Actions will improve access to investment in design, manufacturing and integration technologies.

Operational objectives 1 to 4 will be entrusted to a new 'Chips Joint Undertaking': a proposal for a Council regulation amending Regulation (EU) 2021/2085 establishing the Joint Undertakings under Horizon Europe would amend the provisions on the 'Key Digital Technologies Joint Undertaking', which would be renamed the 'Chips Joint Undertaking' and equipped for its new tasks related to the chips act. European Chips Infrastructure Consortia (ECICs) may be set up, by at least three 'founding members' (Member States, public or private legal entities), to implement action under the initiative. Recognition or rejection of an ECIC is the responsibility of the Commission. Other members may join an established ECIC at any time.

Pillar 2: Security of supply and resilience

The new regulation also intends to boost projects improving the EU's security of supply, by attracting investment and enhancing production capacities. It defines two EU statuses providing a range of benefits to the laureates: **'integrated production facilities'** (IPF) and **'open EU foundries'** (OEF). To obtain one of these statuses (through a Commission decision), a facility has to qualify as a **'first-of-a-kind facility'** (FOAK facility). The scope of the FOAK facility concept has been broadened by the co-legislators in comparison with the Commission proposal: it refers not only to a new or upgraded chip manufacturing facility, but also to a facility for the production of equipment or key

components for such equipment used in chip manufacturing. A FOAK facility should provide innovation concerning the manufacturing process or final product that is not yet substantively present or committed to be built within the EU, e.g. on computing power, or security.

EU funding for the chips act

The Chips for Europe initiative will be supported to 2027 through EU funding from the Horizon Europe programme (€1.725 billion) and the Digital Europe programme (€1.575 billion). As initially proposed by the Commission, the overall budget remains at €3.3 billion. This position was supported by the Parliament, while the Council position was €400 million lower than the Commission proposal (although the distribution proposed was €1.65 billion per programme). The agreed text specifies that all capacity-building activities carried out must be financed through the Digital Europe programme and the related research and innovation activities must be funded through the Horizon Europe programme. The co-legislators adopted two joint statements concerning EU funding: one on the re-use under the chips act of decommitted funds in Horizon Europe, to be used for research activities only; and another concerning the financing of the remaining €50 million, where the Parliament and the Council invite the Commission to explore possibilities to complete the financial envelope under future annual budgetary procedures.

The Commission indicated that in total, together with the €3.3 billion in EU funds, €6.2 billion of public funds would support the initiative up to 2027. The Commission had claimed that the chips act would mobilise a total of more than €43 billion in public and private investment.

Integrated Production Facilities are FOAK facilities for chip manufacturing, and where relevant, include design, or the production of equipment or key components for such equipment, which may integrate other supply chain steps. **Open EU Foundries** (OEF) are FOAK semiconductor manufacturing facilities that offer production capacity for unrelated undertakings. They both contribute to the security of supply for the single market and the resilience of the EU chip ecosystem. Such IPF and OEF should have a positive impact on the EU's chip value chain, with spill-over effects beyond the undertaking or the Member State concerned. They should also invest in innovation, and support the EU talent pipeline. The IPF and OEF will also have preferential access to the pilot lines. The Commission will assess the projects applying for IPF or OEF status, based on criteria listed in the regulation. The IPF and OEF would be recognised as being in the public interest. Member States may, without prejudice to State aid rules, apply support measures and provide for administrative support to IPF and OEF. Member States must ensure that the fastest treatment is given to applications for the construction of an IPF or an OEF. The security of supply of chips and the resilience of the chip ecosystem may be considered an imperative reason of overriding public interest within the meaning of Directive 92/43/EEC and Directive 2000/60. Member States may designate a single point of contact for the IPF or OEF, to facilitate administrative applications. Without prejudice to State aid rules, Member States may also grant them specific support. The Commission could also force the IPF and OEF to prioritise specific chip orders in the event of a crisis (see pillar 3 below).

The co-legislators added an article creating a '**design centres of excellence**' label, awarded by the Commission to EU design centres that enhance the EU's capabilities in innovative chip design. The labelled centres will be considered to be in the public interest and to contribute to the resilience of the EU chip ecosystem. Member States may support them without prejudice to State aid rules.

Pillar 3: Monitoring and crisis response

The co-legislators have added new provisions, supported by Parliament, requiring the Commission to carry out a **strategic mapping of the EU's chip sector**, in cooperation with the ESB. The mapping will assess the EU's strengths and weaknesses in the global chip sector and identify key products and critical infrastructures, depending on the supply of chips; the main user industries in the EU, their needs and dependencies; key segments of the EU's chip supply chain; the technological characteristics, the dependencies on foreign technology and providers, and bottlenecks in the EU's chip sector, including access to inputs; needs for skills and access to qualified workforce in the

sector; and the potential impact of crisis measures on the sector. After consulting the ESB, the Commission will develop a list of early warning indicators based on this mapping. If needed, the Commission could issue voluntary information requests to actors in the EU chip value chain.

The Commission, in consultation with the ESB, will carry out **regular monitoring** of the chip value chain to identify factors that may disrupt, compromise or negatively affect the supply of, or trade in, chips. Activities will consist of: (i) monitoring of the early warning indicators; (ii) Member State monitoring of the integrity of activities carried out by the key market actors and reporting on events that may affect the regular operations of these activities; and (iii) identifying best practices for preventive risk mitigation and increased transparency in the semiconductor sector. The Commission will invite key actors to provide information, on a voluntary basis, to feed into the monitoring activities. Member States could also request information, on a voluntary basis, from key market actors. The Commission will present the findings of monitoring activities regularly to the ESB. Member States, in cooperation with the Commission, will identify key market actors along the semiconductor supply chains established in their national territory.

A national authority will alert the Commission if it identifies a risk of disruption in the chips supply, or has information of any other risk factor or event materialising. When the Commission becomes aware of such a risk, it will carry out a number of **preventive** actions: (i) convene an extraordinary meeting of the ESB to discuss issues such as the severity of the disruptions or the potential activation of the crisis stage; (ii) contact third countries to seek cooperative solutions to address supply chain disruptions; and (iii) ask national competent authorities to assess the state of preparedness of the key market actors. A **crisis** will be considered to occur: (i) when there are serious disruptions in the chip supply chain or serious obstacles to trade in chips in the EU, causing significant shortages, intermediate products or raw or processed materials; and (ii) when such shortages prevent the supply, repair or maintenance of essential products used by critical sectors to the extent that it would seriously affect the functioning of critical sectors. If these conditions are met, **the Commission may propose to the Council to activate the crisis stage**, after consulting the ESB. The Council, acting by qualified majority, may activate the crisis stage by means of an implementing act. The Commission would report to the ESB and the European Parliament on the crisis.

The list of critical sectors is detailed in a new annex. They correspond to those listed in the annex of Directive (EU) 2022/2557 on the resilience of critical entities (energy, transport, banking, financial market infrastructure, health, drinking water, waste water, digital infrastructure, public administration, space), adding to it the sectors of defence and security. Crisis-relevant products are those either used directly, or to produce devices, by the critical sectors.

The chips act sets up an '**emergency toolbox**' to address chips shortages. When the crisis stage is activated, the Commission may adopt a range of measures. These measures must be limited to the critical sectors disturbed or under threat of disturbance due to the semiconductor crisis:

- **Information gathering**: the Commission may request undertakings operating in the chip supply chain to provide information about their production capabilities, capacities and current primary disruptions. The information requested would be limited to what is necessary to assess the nature of the crisis or to identify potential mitigation or emergency measures at national or EU level. Before launching a request for information, the Commission may carry out a voluntary consultation.
- **Priority rated orders**: the Commission may oblige IPF and OEF to accept and prioritise an order of crisis-relevant products. This can also be imposed upon other chip undertakings that have accepted such a possibility when receiving public support. When a semiconductor undertaking established in the EU is subject to a third-country priority rated order measure, it must inform the Commission. Should that obligation significantly impact the operation of certain critical sectors, the Commission may oblige that undertaking to accept and prioritise orders of crisis-relevant products. The co-legislators have specified that priority rated orders are a last resort measure, and have to be restricted to beneficiaries that are users of chips

from critical sectors, or undertakings supplying critical sectors whose activities are disrupted or at risk of disruption and that, having implemented appropriate risk mitigation measures, were unable to avoid and to mitigate the impact of the shortage. The Commission has to consult the ESB before taking its decision on a priority rated order.

- **Common purchasing**: the Commission may, at the request of two or more Member States, act as a central purchasing body on behalf of all Member States willing to participate ('participating Member States') for their public procurement of crisis-relevant products for critical sectors. The Commission would assess the request, taking the views of the ESB into account. The Commission would carry out the procurement procedures and conclude the contracts with economic operators on behalf of the Member States. The deployment, use or resale of the purchased products would be the responsibility of the Member States.

The Commission will regularly inform the Parliament and the Council of any measures taken. The Commission may impose **fines** upon companies that supply incorrect, incomplete or misleading information in response to an information request made during a crisis, or one that does not supply the information within the time limit (€300 000 maximum). It can also impose fines upon companies that do not comply with the obligation to inform the Commission of a third-country obligation (€150 000 maximum – €50 000 for SMEs), or upon companies that do not comply with an obligation linked to priority rated orders (periodic penalty payments, maximum 1.5 % of the current daily turnover – 0.5 % for SMEs).

EUROPEAN PARLIAMENT SUPPORTING ANALYSIS

Ragonnaud G., Section 2: Securing Europe's supply of semiconductors, in Bassot E., Ten issues to watch in 2022, EPRS, European Parliament, January 2022.

Ragonnaud G., Semiconductor supply chain disruption, in Bassot E., Future Shocks 2022: Addressing risks and building capabilities for Europe in a contested world, EPRS, European Parliament, April 2022.

OTHER SOURCES

Chips Act, 2022/0032(COD), Legislative Observatory (OEIL), European Parliament.

ENDNOTES

[1] See also CRS, Semiconductors and the CHIPS Act: The Global Context, May 2023.

[2] This section aims to provide a flavour of the debate and is not intended to be an exhaustive account of all different views on the proposal. Additional information can be found in related publications listed under 'European Parliament supporting analysis'.

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eprs@ep.europa.eu (contact)

www.eprs.ep.parl.union.eu (intranet)

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