European Semiconductor Industry Association

POSITION PAPER

Brussels, 5 December 2025

ESIA Position on the review of the Climate Delegated Act

The European Semiconductor Industry Association (ESIA), representing the European leadership in semiconductor research, design, and manufacturing, would like to make recommendations for the review of the climate delegated act[1]. The feedback below reflects the experience of ESIA's members in working with the technical screening criteria of the climate delegated act. In April 2023, ESIA issued a public guidance document[2] on the Taxonomy Framework.

Semiconductors (or chips) are at the core of Europe's clean and digital transitions. From automotive and industrial automation to telecommunications, aerospace, defence and healthcare, Europe's future hinges on a robust and innovative semiconductor ecosystem.

In 2019, the World Economic Forum noted that semiconductor-enabled technologies such as digital technologies can reduce greenhouse gas (GHG) emissions by 15 percent - almost one-third of the 50 percent reduction required by 2030[3]. For example, most recent electric vehicles (EVs) may contain up to 3000 integrated circuits (ICs), up from between 300 and 1000 in internal combustion engine (ICE) vehicles[4].

The potential and essentiality of semiconductors for the green transition should be reflected in the form of technical screening criteria facilitating the qualification of chip manufacturing as an environmentally sustainable activity. Currently, to demonstrate that a chip manufacturing activity qualifies as environmentally sustainable, actors most often rely on activity 3.6 (manufacture of low-carbon technologies), whose criteria are very difficult to apply.

ESIA calls for the introduction of a dedicated activity covering the manufacture of decarbonisation-enabling semiconductors in the climate delegated act, and, complementarily, for a revision of guidance and/or an amendment to activity 3.6 to make its criteria easier to apply.

ESIA's recommendations for the review of the climate delegated act

Introducing a new activity covering the manufacture of decarbonisation-enabling semiconductors in a revised climate delegated act

[1] Commission Delegated Regulation (EU) 2021/2139
[2] ESIA - Guidance on the EU Taxonomy Framework, Brussels, 28 April 2023
[3] World Economic Forum, "Digital technology can cut global emissions by 15%. Here's how," 2019 https://www.weforum.org/agenda/2019/01/why-digitalization-is-the-key-to-exponential-climate-action
[4] Rho Motion, Semiconductors in EVs, what you need to know https://rhomotion.com/news/semiconductors-in-evs-what-you-need-to-know/

Rue de la Duchesse 11/13
1150 Brussels
Belgium
Tel.: +32 2 290 36 60
Fax: +32 2 290 36 65
secretariat@eusemiconductors.eu
www.eusemiconductors.eu

ESIA is an industry association under the umbrella of
EECA: European Electronic Component Manufacturers' Association
EU Transparency Registry: 22092908193-23

ESIA would like to propose the introduction of a new activity dedicated to the manufacture of semiconductor products. The principles of this new enabling activity would be similar to those of “manufacture of batteries” and “manufacture of renewable energy technologies”.

The newly proposed activity "manufacture of semiconductors" should comprise all relevant elements of the semiconductor production process: research, design, and manufacturing. The activity would cover the production of semiconductors that enable the green and digital transitions, including research to improve semiconductor design and manufacturing processes. Its technology readiness level would range from 4 to 9.

This would be an enabling activity and would cover the NACE code A26.11 (manufacture of electronic components)[5]. Technical screening criteria would be developed based on the nature of the activity.

As explained below and in the Annex, semiconductors are indispensable for climate change mitigation as they enable almost all of the substantial contributions referred to in Article 10 (1) of the Taxonomy Regulation: (a) generation, transmission, storage, distribution, and use of renewable energy, (b) improvement of energy efficiency, (c) increasing, clear or climate-neutral mobility, (g) establishing energy infrastructure required for enabling the decarbonization of energy systems.

European Semiconductor Industry: a strong contributor to reducing carbon emissions[6]

The manufacture of semiconductors and their use in a broad range of applications contribute to the climate change mitigation objective of the Taxonomy by enabling other activities listed in the climate delegated to make a substantial contribution to that objective, with several target activities relying on the use of chips[7]. As semiconductors are virtually everywhere, the list should not be interpreted as exhaustive.

---

[5] On top of A26.11, the following NACE codes could be associated with the activity:
A26.12 Manufacture of loaded electronic boards
A26.30 Manufacture of communication equipment
A27.12 Manufacture of electricity distribution and control apparatus
A72.10 research and experimental development on natural sciences and engineering
A.74.14 Other specialised design activities
M.71.1.2 Close to market research, development and innovation
J.63.11 Data processing, hosting and related activities

[6] ESIA brochure (September 2021):
https://www.eusemiconductors.eu/sites/default/files/uploads/ESIA_GHGbrochure_1907_0.pdf

[7] 3.1. Manufacture of renewable energy technologies;
3.3. Manufacture of low-carbon technologies for transport;
3.4. Manufacture of energy efficiency equipment for building;
3.6. Manufacture of other low-carbon technologies;
4.1 Electricity generation using solar photovoltaic technology;
4.3. Electricity generation from wind power;
4.9. Transmission and distribution of electricity;
4.16. Installation and operation of electric heat pumps;
6.1 Passenger interurban rail transport;
6.2. Freight rail transport;
6.3 Urban and suburban transport, road passenger transport;
6.4. Operation of personal mobility devices;
6.5. transport by motorbikes, passenger cars and commercial vehicles;

Semiconductor products play an irreplaceable role in the functionality and efficiency of net-zero technologies and in lowering the carbon footprint at every step of the value chain. Most paths toward climate neutrality involve significant electrification and digitalisation, both of which are enabled by innovative semiconductor products. Buildings, transportation, agriculture, and data centers are the most relevant sectors given their share of overall greenhouse gas (GHG) emissions, but semiconductor products also enable emission reductions in other sectors, such as cloud computing, the Internet of Things (IoT), and renewable energy generation.

At the same time, emissions from the semiconductor manufacturing industry represented 0.0014% of the total GHG emissions in Europe in 2019[8]. The GHG-saving effects of chip-based applications do much more than compensate for the climate footprint of semiconductor manufacturing.

For more information on the enabling role of semiconductors for climate change mitigation, please consult the Annex.

The limitation of activity 3.6 (other low-carbon technologies) for demonstrating that manufacturing qualifies as environmentally sustainable

The technical screening criteria under activity 3.6 mandate a comparison to the best alternative solution in the market. However, given the nature of semiconductor products such a comparison is not possible.

It is extremely difficult to compare one semiconductor product to another. However, the Taxonomy framework demands such a comparison, requiring companies to show that their economic activities are aimed at and demonstrate substantial life cycle GHG emission savings compared to the best performing alternative available on the market.

To ensure a meaningful comparison, companies would need to estimate their product's advantage compared to a competing product in terms of technology gain (e.g., node), carbon footprint (e.g., estimation of overall emissions by units), and/or power consumption per application (including idle mode assumptions). However, given that this is not feasible for the semiconductor industry (for example, because there is no direct competition or it is unknown), ESIA believes this criterion should be satisfied where companies compare a given product with the previous generation thereof or an alternative solution from their own product portfolio. This could be reflected in revised guidance documents or an updated phrasing of activity 3.6.

6.6. freight transport services by road;
7.3 installation, maintenance and repair of energy efficiency equipment;
7.4. installation, maintenance, and repair of charging stations for EVs in buildings;
7.5. installation, maintenance and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings;
Mitigation,
7.6. installation, maintenance and repair of renewable energy technologies;
Mitigation,
8.1. data processing, hosting and related activities;

[8] Annual EU greenhouse gas inventory 1990–2019 and inventory report (2021), https://www.eea.europa.eu/publications/annual-european-union-greenhouse-gas-inventory-2021

Alternatively or complementarily, a new activity covering the manufacture of semiconductors would help leverage their key role for climate change mitigation, as explained above.

Aligning the definition of "substances of concern" across legislations

ESIA considers that the definitions of "substances of concern" across legislations should be harmonized to facilitate their implementation by stakeholders, specifically in the ESPR, the Taxonomy technical screening criteria and the European Sustainability Reporting Standards (ESRS)[9] (see Annex II). Uncertainty around the definition of "substance of concern" in the do not significantly harm (DNSH) criteria for the circular economy contributes to difficulties implementing the criteria of activity 3.6.

For further information:

Maxime Castes
EHS & Sustainability Manager
esh@semiconductors.eu
European Semiconductor Industry Association (ESIA)
Tel: + 32 494 11 28 83
Web: https://www.eusemiconductors.eu/

ABOUT ESIA

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

[9] As supplemented by Commission Delegated Regulation (EU) 2023/2772 supplementing Directive 2013/34/EU of the European Parliament and the Council as regards sustainability reporting standards

Annex I: semiconductors as enablers of energy savings and replacement of fossil fuels

3.1 Manufacture of renewable energy technologies; 3.6 Manufacture of other low-carbon technologies; 4.1 Electricity generation using solar photovoltaic technology; 4.3. Electricity generation from wind power; 4.9. Transmission and distribution of electricity; 4.16. Installation and operation of electric heat pumps; 7.4 installation, maintenance, and repair of charging stations for EVs in buildings; 7.6 installation, maintenance and repair of renewable energy technologies

Semiconductors facilitate an expansion of renewable energy use. Smarter electric grids enable reductions of greenhouse gas (GHG) emissions in buildings and ultimately shifting towards a low carbon economy. Power management semiconductors based on innovative materials such as silicon carbide (SiC) and gallium nitride (GaN) help enable the electronic industry to minimise energy losses by converting power more efficiently and allowing society to get more out of the electricity supplied. Semiconductors enable a more efficient renewable energy generation, transmission and excess storage through energy storage systems that help to deliver power more reliably when and where it is needed whilst eliminating electricity wastage.

For more information on the digitisation's structuring role for the roll-out of renewables, you may consult the International Energy Agency's Report on Digitalization & Energy[10].

3.3 Manufacture of low-carbon technologies for transport, 6.1. Passenger interurban rail transport; 6.2 Freight rail transport; 6.3 Urban and suburban transport, road passenger transport; 6.4. Operation of personal mobility devices; 6.5. transport by motorbikes, passenger cars and commercial vehicles; 6.6. freight transport services by road

According to the consultancy RoH Motions, most recent electric vehicles (EVs) may contain up to 3000 integrated circuits (ICs), up from between 300 and 1000 in internal combustion engine (ICE) vehicles[11].

Generally speaking, semiconductors facilitate the ongoing shift from traditional vehicles to mobility solutions: focussing on connectivity, autonomous driving, electrification and low carbon mobility. Semiconductors help redefine mobility, reduce emissions and help alleviate

[10] International Energy Agency, Digitalization & Energy
https://iea.blob.core.windows.net/assets/b1e6600c-4e40-4d9c-809d-1d1724c763d5/DigitalizationandEnergy3.pdf
[11] Rho Motion, Semiconductors in EVs, what you need to know
https://rhomotion.com/news/semiconductors-in-evs-what-you-need-to-know/

congestion. Semiconductor technology contributes to the realisation of the EU's Sustainable and Smart Mobility Strategy Goals.

Emission reduction in vehicles and in transportation systems is made possible by semiconductor-based in-vehicle networks and sensors that increase fuel efficiency by reducing vehicle weight. Battery control and energy management semiconductor solutions extend the distance range of electric and hybrid transport and improve the predictability of that range: increased distance range is key to mass adoption of Electric vehicles. Automated and connected Advanced Driver Assistance Systems (ADAS) enabled by semiconductors help prevent emissions. Features ranging from basic functionality like cruise control, all the way up to full self-driving make cars more capable than humans in fuel saving behaviour. Vehicle-to-vehicle communication systems also help reduce traffic congestion, further contributing to reducing fuel consumption. ADAS solutions also make driving safer for drivers and pedestrians alike.

3.4 Manufacture of energy efficient equipment for buildings, 7.5. installation, maintenance and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings

Buildings account for nearly one-third of global energy consumption. Semiconductors help improve the operational efficiency of buildings by using real-time data that lowers total energy consumption, by adapting the HVAC (heating, ventilation and air conditioning) equipment's usage to human presence, activity, and preference settings.

8.1. data processing, hosting and related activities

Semiconductors facilitate the processing of data at the edge, i.e. directly in the IoT devices. This reduces the energy needed for data transmission and cloud services

Semiconductors facilitate the processing of data at the edge, i.e. directly in the IoT devices. This reduces the energy needed for data transmission and cloud services.

The use of sensors and smart meters to track consumption allows various industries to monitor, identify and optimise energy usage. Vast amounts of energy can be saved with smart control systems in the billions of IoT devices worldwide used to control lighting, heating and water. Semiconductors enable smart applications and can drive energy efficiency in every area of society; where we live, where we work and how we travel.

Annex II: definition of SOCs across legislations

Chemicals Strategy for Sustainability (14 Oct. 2020)	"These include, in the context of this strategy and related actions, primarily those related to circular economy, substances having a chronic effect for human health or the environment (Candidate list in REACH and Annex VI to the CLP Regulation) but also those which hamper recycling for safe and high quality secondary raw materials."
ESPR (13 June 2024)	"substance of concern" means a substance that: (a) meets the criteria laid down in Article 57 of Regulation (EC) No 1907/2006 and is identified in accordance with Article 59(1) of that Regulation; (b) is classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 in one of the following hazard classes or hazard categories: i. carcinogenicity categories 1 and 2; ii. germ cell mutagenicity categories 1 and 2; iii. reproductive toxicity categories 1 and 2; iv. endocrine disruption for human health categories 1 and 2; v. endocrine disruption for the environment categories 1 and vi. persistent, mobile and toxic or very persistent, very mobile properties; vii. persistent, bioaccumulative and toxic or very persistent, very bioaccumulative properties viii. respiratory sensitisation category 1; ix. skin sensitisation category 1;

	x. hazardous to the aquatic environment — categories chronic 1 to 4; xi. hazardous to the ozone layer; xii. specific target organ toxicity — repeated exposure categories 1 and 2; xiii. specific target organ toxicity — single exposure categories 1 and 2; (c) is regulated under Regulation (EU) 2019/1021 (POPs); or (d) negatively affects the reuse and recycling of materials in the product in which it is present
Taxonomy Regulation (including climate and environmental delegated acts – 4 June 2021 and 25 June 2023)	No definition of "substance of concern" – though the term occurs in the technical criteria on several occasions. However, Art. 13(1) of Taxonomy Regulation specifies that an economic activity shall qualify as contributing substantially to the transition to a circular economy, where that activity *"[…]* *(e) substantially reduces the content of hazardous substances and substitutes substances of very high concern in materials and products throughout their life cycle, in line with the objectives set out in Union law, including by replacing such substances with safer alternatives and ensuring traceability; […]."*
REACH Regulation	No definition as yet, but potential inclusion on targeted revision of REACH REACH introduced a detailed definition of "Substances of Very High Concern" or SVHCs, which must not be confused with SOCs. Both coexisting concepts nevertheless cause some confusion.
European Sustainability Reporting Standards (ESRS), as amended by Directive (EU) 2022/2464 (CSRD),	An SoC is defined as "a ***substance*** that: i. meets the criteria laid down in Article 57 and is identified in accordance with Article 59(1) of Regulation (EC) No 1907/2006 of the European Parliament and of the Council [(32)];"

as supplemented by delegated regulation (EU) 2023/2772 (31 July 2023)	ii. is classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 of the European Parliament and of the Council [(33)] in one of the following hazard classes or hazard categories: — carcinogenicity categories 1 and 2; — germ cell mutagenicity categories 1 and 2; — reproductive toxicity categories 1 and 2; — endocrine disruption for human health; — endocrine disruption for the environment; — Persistent, Mobile and Toxic or Very Persistent, Very Mobile properties; — Persistent, Bioaccumulative and Toxic or Very Persistent, Very Bioaccumulative properties; — respiratory sensitisation category 1; — skin sensitisation category 1; — chronic hazard to the aquatic environment categories 1 to 4; — hazardous to the ozone layer; — specific target organ toxicity, repeated exposure categories 1 and 2; — specific target organ toxicity, single exposure categories 1 and 2; or iii.. negatively affects the re-use and recycling of materials in the product in which it is present, as defined in relevant Union product-specific ecodesign requirements.”