

ESIA Position on the Circular Economy Act

Introduction

The [European Semiconductor Industry Association](#) (ESIA), representing the European leadership in semiconductor research, design, and manufacturing, would like to comment on the potential impact of the upcoming Circular Economy Act and the revision of the Waste Electrical and Electronic Equipment (WEEE) Directive on the sector.

Semiconductors are 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.

ESIA's remarks on the call for evidence document underpinning the consultation on the new Circular Economy Act

Exempting semiconductor manufacturers from potential binding retrieval and recycling requirements

ESIA would like to react to section B of the call for evidence document (policy and objectives), which hints at the potential introduction of material recovery targets for the recycling of electronic products, including semiconductor products. Indeed, the Commission signals that the Circular Economy Act may seek to boost recovery of critical raw materials (CRMs) by introducing recycling obligation for waste electronic products coupled with recycling efficiency targets or material recovery targets on CRMs applying to the recycling of waste electronic products.

We understand that such material recovery targets could follow the model of the Batteries Regulation, which mandates material recovery targets for various metals listed as CRMs (i.e., cobalt, lithium, copper, and nickel) when recycling lithium-ion batteries¹.

ESIA opposes strict material recovery targets and recycling obligations applying to semiconductor products specifically and to CRMs contained in waste semiconductors.

Strict recovery and recycling obligations for critical materials could undermine EU semiconductor quality and competitiveness, without achieving significant progress towards recovery targets. It is true that semiconductor products have been recycled for many years to recover precious metals such as gold, silver, and palladium. In recent years, recycling has increasingly included aluminium, copper, and even silicon. However, for silicon, recovery rates are primarily achieved from semi-finished products rather than end-products. Recovery from end-products remain under-developed. In addition, regarding CRMs specifically, those elements (e.g.,

¹ Part C of Annex XII to [Regulation \(EU\) 2023/1542](#)

gallium, silicon metal, germanium, and rare earth elements) are present in semiconductor products in small quantities and require exceptionally complex processes to recover. However, the technology to extract them from e-waste is still largely underdeveloped ([SEMI-imec 2025](#); [Ueberschaar et al., 2017](#); [Hamzat et al., 2025](#)). As a result, recovery is often low-yield and, when recovery is possible, materials are often contaminated. Even trace impurities render materials unusable, as they cause defects that destroy semiconductor chips or degrade their performance. Current processes are therefore not scalable to meet industrial demands or quality standards and, considering their low effectiveness, incur high financial costs.

Existing technologies often require complex chemical treatments, high energy consumption, and construction of specialised facilities. In their current experimental state, recovery technologies also generate significant carbon emissions and hazardous byproducts. Resultant costs of energy, facility upgrades, labour, and abatement would impose high financial burdens on semiconductor manufacturers for disproportionately low material return. These costs would additionally undermine the global competitiveness of European semiconductor manufacturers and the companies that they supply.

Through initiatives like [GENESIS](#), the semiconductor industry is investing in developing viable recovery technologies. While economically and sustainably scalable solutions are not yet available, ESIA recommends that the European Commission abstain from applying strict material recovery targets and recycling requirements to semiconductor manufacturing sector.

We thank the Commission for its consideration of our feedback and remain at its disposal for any further information.

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ABOUT ESIA

The European Semiconductor Industry Association (ESIA) is the voice of the semiconductor industry in Europe. Its mission is to represent and promote the common interests of the Europe-based semiconductor industry towards the European institutions and stakeholders in order to ensure a sustainable business environment and foster its global competitiveness. As a provider of key enabling technologies, the industry creates innovative solutions for industrial development, contributing to economic growth and responding to major societal challenges. Being ranked as 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.