European Semiconductor Industry Association

POSITION PAPER

Intangible Technology Transfer Controls

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Executive Summary

In this position paper the European Semiconductor Industry Association (ESIA) would like to outline the recommendations regarding the application of EU dual-use export controls to intangible technology transfers (ITT). As semiconductor innovation increasingly relies on global collaboration, cloud services, remote access, and cross-border R&D, the industry faces growing uncertainty regarding the interpretation of existing export control rules.

ESIA calls for clear, harmonised, and practical guidance on key concepts such as **"export," "making available," and "use technology,"** particularly in relation to cloud computing, encryption, and digital collaboration tools. We advocate for a holistic, risk-based approach focused on actual access to and use of controlled technology rather than technical data transmission alone.

ESIA would also like to set out recommendations for the upcoming evaluation of EU Regulaton 2021/821, including greater consistency across Member States, proportionate compliance requirements, improved alignment with international partners, and more flexible authorisation mechanisms for low-risk activities and intra-company transfers.

I. Introduction

The European Semiconductor Industry Association (ESIA) represents Europe-based leadership in semiconductor research, design and manufacturing. Semiconductors are essential to Europe's digital and green transitions and underpin key sectors such as automotive, industry, security, healthcare, energy, and communications. The European semiconductor industry operates in a highly global environment and depends on open markets, international cooperation, and clear and predictable rules to remain competitive.

ESIA welcomes the opportunity to contribute to the discussion on EU dual-use export controls, particularly as controls on intangible technology transfers (ITT) are becoming increasingly important. It is important to highlight that innovation is driven not only by physical goods, but also by design activities, software, process know-how, data sharing, and collaboration across borders.

Intangible transfers are especially relevant for the semiconductor sector. The industry relies on global R&D cooperation, internationally distributed design teams, cloud-based tools, remote

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access to manufacturing processes, and the exchange of highly specialised technical knowledge. These activities are essential for developing and producing semiconductors and manufacturing equipment. At the same time, their breadth and complexity create uncertainty for companies when it comes to how export control rules should be interpreted and applied in practice.

Against this background, this position paper sets out ESIA's views and recommendations on intangible technology transfers under the EU dual-use framework. Its objective is to support clear, consistent, and workable guidance that enables effective compliance by exporters while safeguarding Europe's capacity to innovate and compete globally. Some of the recommendations may be relevant for forthcoming Commission guidance on ITT, while others are intended to inform broader policy discussions, including in view of the upcoming evaluation of Regulation (EU) 2021/821, hereinafter the *EU Dual-Use Regulation*.

II. Key considerations for the application of rules on ITT

ESIA would like to underline that businesses can only comply effectively with rules on intangible technology transfers if those rules are clear and precisely worded, leaving no room for different interpretations. Legal ambiguity and various interpretations render compliance more difficult, reduces business predictability and increases the risk of unintentional non-compliance.

For these reasons, ESIA highlights several issues that should be addressed both in forthcoming guidance on intangible technology transfers and in the broader context of the upcoming review of the EU Dual-Use Regulation. From an industry perspective, particular attention should be given to key areas such as **digital infrastructure, data governance, cloud services, data security mechanisms using encryption, and R&D in an interconnected global semiconductor value chain.**

There is also an urgent need to clarify core definitions and the overall scope of the rules, in particular:

Role of guidance

Differences in how export control rules are applied across Member States create varying interpretations and make consistent compliance across the Single Market more challenging. ESIA therefore welcomes the development of EU-wide guidance as a common reference for practitioners. Clear, practical and user-friendly guidance, guidance by concrete examples, would promote consistent application, ensure a level playing field and reduce uneven conditions for European companies competing globally. It is also important that the guidance are regularly updated to reflect technological developments, evolving business models and new forms of global collaboration and data flows.

Previous EU compliance guidance for industry (2019)[1] and academia (2021)[2] was welcomed but also raised additional implementation questions. Guidance is therefore not an end in itself and should help authorities assess where clarification is sufficient and where regulatory amendments may be needed to address systemic challenges related to ITT.

[1] Commission Recommendation (EU) 2019/1318
[2] Commission Recommendation (EU) 2021/1700

Definitions

Clear definitions are needed, especially for the core concepts detailed in the below paragraphs.

Intangible *transfer* vs. intangible *technology*

An ambiguity exists between:

- Intangible Technology: the subject matter (e.g. software, technical data, know-how in non-physical form), and
- Intangible Transfer: the act of digitally transferring such technology across borders

The lack of distinction leads to inconsistent regulatory interpretations, particularly in digital environments where technology may be stored, mirrored, or processed without any actual transfer of control or access.

ESIA recommends that the guidance should make clear that it is about 'intangible technology transfers', meaning technology transfers via intangible means, such as digitally transferring technology across borders.

ESIA also suggests that the European Commission should explicitly distinguish in the Guidance between the nature of the technology and the act of transfer in guidance and, where necessary, provide legislative clarification.

***Making available* and *export* in cloud environments**

There is significant divergence among Member States regarding what constitutes:

"*Making available*", and consequently an "*export*" in the context of cloud computing and open-source environments. Two primary interpretations have emerged:

- Transaction-based (Transmission-Focused) approach, exemplified by the competent authority in Germany (the Federal Office for Economic Affairs and Export Control (BAFA)). BAFA considers uploading controlled technology to a server outside the EU as an export. Based on the interpretation of export as "*transmission*," regardless of access.
- Access-based approach, reflected in the Dutch interpretation. It considers an export to occur only when a person outside the EU is granted access to the technology.

ESIA believes that transmission without usability does not constitute a meaningful transfer. For example, encrypted data without a license key or decryption capability does not enable use and therefore should not qualify as an export. Conversely, providing the ability to access technology—such as by supplying a licence key or other means of decryption—should be regarded as enabling use.

ESIA therefore advocates for the adoption of a harmonised definition of "*export*" based on access and usability, rather than mere transmission. The guidance should clarify that storage, mirroring, or routing of data without granting access does not constitute an export. ESIA would also appreciate it if the guidance could include specific scenarios. This would support implementation and provide greater certainty in enforcement.

Use Technology

There are inconsistencies across EU Member States in the interpretation of *"use technology"*, particularly in the context of dual-use export controls. While commonly understood, in line with the Wassenaar Arrangement, to encompass operation, repair, refurbishment, overhaul,

maintenance and installation, the precise scope and application of the term vary across national practices. This creates legal uncertainty for companies and risks uneven enforcement within the EU.

The absence of a harmonised definition creates several challenges, including divergent licensing requirements across Member States for identical activities, uncertainty for companies when assessing whether technical support or services fall under controlled "*use technology*", and the risk of over- or under-compliance depending on the jurisdiction.

ESIA therefore asks for a clear EU-wide definition of "*use technology*" that delineates the scope of activities covered, distinguishes basic operational use from advanced technical intervention, reflects modern industrial practices such as remote diagnostics and digital servicing, and aligns with a risk-based approach to export controls.

Practical use cases

In particular, use-cases occurring regularly across the semiconductor industry illustrate the complexity of the above mentioned definitions and should be considered. Often product development occurs in teams that are collaborating internationally cross-border, with R&D and design team, and servers that can be located in the EU or outside the EU.

One typical relevant example is the case of a development project which contains cryptographic IP, with a semiconductor design team located in different countries. What should be considered the transfer? E.g. is the location of server as such already a transfer, or is the transfer granting a person (involved in the project) access to the items / to the corresponding documentation? Other examples include several instances of intra-company transfers. Having operational alignment across Member States would be helpful.

ESIA suggests that the guidance includes practical advises how exporters need to treat these use cases, how can they collaborate in international teams.

Need for clarity and guidance on risks, responsibilities, and reporting requirements

Towards a holistic, risk-based approach

ESIA would like to emphasize the need to shift from a transactional approach to a holistic, risk-based governance model for intangible technology transfers, particularly in cloud environments. Current interpretations in some Member States treat each act of copying, uploading, or mirroring data as a separate export. Such an approach is technically misaligned with modern cloud architectures, which inherently rely on redundancy, distributed storage, and multiple transient data transmissions, and does not effectively target actual proliferation risks.

ESIA advocates for a shift toward a holistic, risk-based approach, which includes focusing on who will access and use the technology, rather than where data packets are stored; and also recognising that cloud systems inherently involve multiple transient data transmissions and risk arises only when access is granted to controlled technology.

In addition, given the growing number of compliance obligations and the scope for divergent national implementation, ESIA calls for greater operational alignment across Member States regarding risk appetite and common "red lines" for typical ITT activities. A proportionate, risk-

based framework should take into account relevant indicators such as destinations, red flags, end users, and the sensitivity of items concerned.

To support effective implementation and enforcement, ESIA also recommends establishing mechanisms for information sharing on diversion patterns, countries involved and companies presenting elevated circumvention risks.

Cloud-related risks need clearer explanation

This includes issues such as the location of servers, the location of users (including travel and hybrid work), modes of transmission, and the risk of access by third-country persons. There is currently a gap between regulators and industry on how these risks are assessed.

ESIA would welcome clear guidance on what risks are considered relevant and what exactly needs to be protected.

Clarification of roles and responsibilities in cloud service provisions are recommended, especially where cloud infrastructure is provided as a service.

When technology is accessed or processed through third-party cloud providers, ESIA asks for clarification as to who is considered responsible for cloud services, and in which context.

Guidance is needed on tracing and reporting requirements

Semiconductor business models are highly complex and involve software, manufacturing processes, design activities, process design kits (PDKs), mandatory libraries, and multiple layers of intellectual property. Fully tracing, valuing, and reporting all elements is often not feasible in practice. These operations are particularly challenging in the case of semiconductor foundries.

ESIA recommends clear guidance on proportionality, including the required level of aggregation and practical approaches to authorisation and reporting.

Research-related activities require a harmonised approach

There is currently no common EU understanding of how export controls apply to research linked to the "*development*", "*production*", or "*use*" of dual-use items. With up to 27 different interpretations across Member States, a more harmonised EU approach is needed.

ESIA suggests a common interpretation of the above terms, as well as exemptions such as "*basic scientific research*". It is essential to ensure a level playing field in the EU and support competitiveness when collaborating with partners, particularly in the United States.

Clarify the treatment of encrypted technology transfers

Encryption plays a central role in modern semiconductor design and collaboration workflows, yet current export control rules do not clearly explain how it affects intangible technology transfers.

ESIA calls for clarity on the treatment of encrypted datasets and on the circumstances under which the transmission or storage of encrypted, unreadable technology outside the EU qualifies as an export or transfer. In particular, clarification is needed on whether storing encrypted information on foreign cloud servers constitutes an export, and whether sending encrypted technology outside the EU should be considered an export where the recipient has no ability to decrypt or access the underlying information.

III. Recommendations for the upcoming evaluation of the EU Dual-Use Regulation

Export and exporter

These terms are currently used inconsistently among Member States, making it difficult to apply them in practice and increasing legal uncertainty. The upcoming evaluation of the EU Dual-Use Regulation should clarify that no "export" occurs when *encrypted* technology is transmitted or stored outside the EU but not readable or accessible to the recipient until is decrypted and that this does not require authorisation.

ESIA suggests that the EU should consider rules similar to the U.S. EAR 734.18, where activities such as sending, taking, or storing "technologies" or software that is either unclassified, or secured (means: encrypted, with reference to certain standards), are not considered exports, reexport or transfers.

Access granted to IT administrators located outside the EU

Another related issue concerns access granted to IT administrators located outside the EU.

ESIA recomments that this, too, should not be treated as an export if the data are secured. Such approach would reduce administrative burdens while maintaining strong safeguards, as the technology remains effectively inaccessible without decryption.

Differences between EU export control rules and those of key partners remain a continued source of concern

Benchmarking the EU approach against jurisdictions such as the U.S. during the upcoming review of the EU Dual-Use Regulation could promote greater convergence. In particular, the treatment of information "*in the public domain*" under rules on intangible technology transfers differs significantly between the EU and the United States.

In the EU dual-use regime, transfers of controlled technology- including via cloud or online access - may require authorisation unless clearly excluded, and Member States interpret "*public domain*" differently, creating uncertainty. By contrast, U.S. export rules generally exempt public-domain information, open-source or widely published data, and even the intention to publish such data, reducing licensing burdens. This divergence creates challenges for global businesses and research collaboration.

During the upcoming review of the EU Dual-Use Regulation ESIA recommends developing clearer and more harmonised definitions, and benchmarking the EU approach against jurisdictions such as the U.S.

Adjustments to EUGEAs

ESIA would like to highlight the potential value of introducing an additional *EU General Export Authorisation (EUGEA) specifically tailored to cloud computing activities* for industry and research organisations.

ESIA believes that the existing EUGEA EU007 for intra-company transfers could become a more effective and widely used instrument if it were amended accordingly. Such adjustments should aim to increase its practical usability for exporters while ensuring that regulatory focus remains on the most significant risk areas, as follows:

- Remove the deletion requirement for technology (as in practice technology will not be deleted and it is used through the product life cycle anyhow, and technology is further developed)
- Increase scope of allowed destinations, excluding only sensitive countries
- Extend the applicability to all group companies (not only to direct daughter, sister, mother company) as groups have a highly complex shareholder structure
- Cover scenarios where employees are on business travel or working remote from abroad in any of the countries listed as eligible in the license (embargo excluded).
- Cloud-related risks require clearer and more precise articulation, particularly with respect to the notion of "clawing back" technology. Once technology has been lawfully accessed, stored, or processed in a cloud environment, it cannot be meaningfully or reliably "clawed back" in practice. Data replication, distributed storage architectures, and third-party infrastructure dependencies mean that control over information cannot be fully reasserted after the fact. As a result, regulatory approaches should avoid assumptions that technological access or dissemination can be reversed ex-post. Instead, policy frameworks should focus on preventative safeguards, access controls, and encryption standards at the point of use and transfer, rather than relying on the impractical expectation of retrospective containment.

IV. Conclusions and Recommendations

Clear and workable guidance on intangible technology transfers is essential for the effective implementation of the EU dual-use framework in an increasingly digital and knowledge-driven economy. From the perspective of the semiconductor sector, legal certainty and consistency across Member States are key to ensuring compliance while preserving Europe's capacity to innovate and compete globally.

Based on the issues outlined above, ESIA recommends that forthcoming guidance and future reflections in the context of the evaluation of the EU Dual-Use Regulation, should:

- **Clarify key definitions and scope,** including core concepts such as intangible, transfer, controlled technology, export, and exporter, in order to reduce divergent interpretations and improve legal certainty.
- **Address practical use cases**, in particular cloud services, encryption, research collaboration, and open-source activities, supported by clear and concrete examples reflecting real business practices.
- **Promote an holistic, risk-based approach** and **provide proportionate guidance** on tracing and reporting, ensure EU-wide consistency, and consider introducing general licenses for low-risk transfers, including routine intra-company exchanges, tape-out services with foundries in low-risk destinations, and publicly funded R&D projects without restrictions on public dissemination to reduce administrative burden where the compliance risk is demonstrably minimal.

Such an approach would facilitate effective compliance, reduce unnecessary administrative burden, and help maintain a level playing field for Europe-based semiconductor companies and research institutes, while supporting the EU's broader security and competitiveness objectives.

For 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.