



CRITICAL TECHNOLOGIES AND INDUSTRIAL CAPABILITIES: NATIONAL DEFINITION AND POLICY IMPLICATIONS

The Spanish case

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May 2022



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The Armament Industry European Research Group (Ares Group) was created in 2016 by The French Institute for International and Strategic Affairs (IRIS), who coordinates the Group. The aim of the Ares Group, a high-level network of security and defence specialists across Europe, is to provide a forum to the European armament community, bringing together top defence industrial policy specialists, to encourage fresh strategic thinking in the field, develop innovative policy proposals and conduct studies for public and private actors.

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ABSTRACT

In Spain, the concept of critical technologies is limitedly mentioned in strategies and policies. Industrial policies touch on the need to bond industrial and technological capabilities, with no reference to criticality levels. The revised 2021 National Security Strategy does it once, although it plans new monitoring mechanisms on capacities and dependencies which might be promising only if it is able to shortlist critical technologies and other categories. The FDI Screening Mechanism is the only tool which clearly defines and makes a distinction with regards to critical technologies, building on EU's policies. Policy recommendations are to complete its capabilities mapping with a clear matrix of categories, and to venture to prioritize some technologies over others.

Keywords: Spain / critical technology / industrial policy / European Union

THE SCOPE OF CRITICAL TECHNOLOGIES AND INDUSTRIAL CAPABILITIES

Policies addressing how to foster or revamp the industrial landscape are including, slowly but growingly, technology areas and capabilities as issues to be considered. The 2020 Industrial Policy Comprehensive Plan¹ explicitly acknowledges to be aligned with EU's recent measures (also the so-called synergies Action Plan, which include the EU's Observatory of Critical Technologies), but still there is neither definition nor categorization of 'critical technologies', and this is not largely linked to the issue of industrial capabilities and strategic autonomy.

Meanwhile, the latest revised National Security Strategy² (NSS), which was released in December 2021, places the need to strengthen technology and strategic sectors as the second of three goals. This genuinely bonds industrial capabilities and technology under the same umbrella. It is important to remark that there is a list of several 'strategic, first-need assets' which include technologies, but these are not comprehensive and include other sectors. Concretely, the Line of Action 10, addressing the creation of a Strategic Reserve based on national capabilities of industrial production, aims to « *safeguarding the industrial base that supplies essential and strategic resources, such as electronic components, strategic materials, high-tech machinery, aeronautics, semiconductors, essential chemicals, advanced agricultural equipment, communications technology and healthcare equipment, among others.* » Additionally, 'critical technology' is only mentioned once³, and out of the scope of policy actions.

This approach is a forward line with regard to the previous strategy from 2017⁴, which envisaged technology as one of five drivers of transformation, and approached technological development as a "means" to boost the security dimension, as well as to improve intelligence services' response capacity, or resilience upon critical infrastructures' vulnerability. The 2021 NSS broadens this scope and devises technology, not only as a "driver" or means in the purely security realm, but also as an end in itself which also aims to encompass industrial capabilities and non-security domains.

There are other Spanish initiatives aiming to get closer to the link between industrial capabilities, critical technologies and strategic autonomy. This is the case of the Spanish-Dutch

¹ It is important to note that the [2020 Industrial Policy Comprehensive Plan](#) is a set of guidelines (not an industrial strategy as such). It is led by the Ministry of Industry, Commerce and Tourism.

² [2021 National Security Strategy](#), Government of Spain.

³ It concretely refers to the global technology race which "*includes both critical and dual-use technology export control*"³.

⁴ [2017 National Security Strategy](#), Government of Spain.

official non-paper⁵ on Open Strategic Autonomy. In this common position, both countries demand to build up a ‘future-oriented industrial policy’ at the EU level which undoubtedly requires a stronger link between industrial and technological capabilities. However, the focus is put onto industrial measures, and less on critical technologies.

To give an example, the joint paper does stress out that “*critical sectors and technologies through an ecosystem approach will help us facilitate more industrial and technological cooperation*” across Member States. However, when it comes down to how fostering this nexus at the very EU level, critical technologies hardly appear. Main priorities are the strengthening of European Alliances – as a way to boost EU’s competitiveness-, and the need to develop common roadmaps in technologies generally speaking⁶, diversify supply chains, and identify key technologies.

However, the intertwining between critical technologies and industrial policy is not only about security. Defence technologies also play an important role. It was clearly stated in February 2021 when the European Commission announced the Action Plan between civil, defence and space industries to further enhance Europe’s technological edge and support its industrial base. In the case of Spain, the 2020 Defence Policy Directive does mention the need for “greater autonomy in defence technological capabilities”, but it does not⁷ explicitly talk on how to build up synergies with the industrial base or how to link it with innovation policies.

Also, the Defence Technological and Industrial Base (DTIB) has so far promoted limited cross-fertilisation between defence capabilities development projects and the civilian sector. Defence technologies are developed under the umbrella of budgets from the Ministry of Defence, and transfer mechanisms and bureaucratic criteria to allow the civilian sector to seize these defence technologies remains limited. However, the situation is slowly changing as some companies which were typically oriented to defence-related portfolio are now opening up their products to the civilian sector. There are dedicated budgets on technology capability development in the Spanish Ministry of Defence’s annual budget. The 2022 annual budget⁸ devotes a section to innovation, wherein it talks about the need to get industry and defence technologies closer. However, no itemised budgets are framed. In those cases where there

⁵ The Spanish-Dutch official non-paper was released in March 2021.

⁶ Although some of these proposals are related to the EU’s action plan on synergies, including roadmaps on critical technologies which was released one month before the release of this non-official paper between Spain and the Netherlands, the joint position document does not differentiate between traditional, critical, emerging or disruptive technologies, and what this would mean for the strategic planning of industrial policies in the short- and long-term.

⁷ Arteaga, F. (2021). *Tecnología y autonomía estratégica en la Defensa española*, Policy Paper, Elcano Royal Institute. Link : <https://media.realinstitutoelcano.org/wp-content/uploads/2021/12/policy-1.pdf>

⁸ Ministerio de Defensa (2022), *Presupuesto del Ministerio de Defensa, Año 2022*. Link: <https://www.defensa.gob.es/Galerias/presupuestos/presupuesto-MINISDEF-2022.pdf>

are specific targeted budgets to certain technologies (e.g. how to digitalize the defence management system, or how to develop unmanned vehicles, for example), these money allocations are given across different boxes of funding. This is, there is no specific programme which is single-handedly devoted to only funding defence technologies.

MONITORING MECHANISMS

It is in the area of monitoring mechanisms where two policy measures are way ahead of the rest: the Spanish FDI Screening Mechanism (which addresses export control risks), and the revised 2021 National Security Strategy (which plans to foresee potential and confirmed dependencies).

First, Spain is one of the few Member States which already had an existing FDI screening mechanism and adopted new amendments right after the launch of the EU-level one in 2020. The new regulation has enormously⁹ expanded the number of activities and sectors the investment authorization is subject to, with respect to the previous regime, and Spain has shown a high activity with it¹⁰. Prior to this, Spanish mechanism built on a specific list of critical technologies released by the EU's Council back in 2009¹¹, and a focus on sectors with access to sensitive information, particularly to personal data, or with the capacity to control such information, since 2018¹².

However, there is a close monitoring mechanism which is not yet comprehensive and may pose a risk if unchanged: the Inter-ministerial Board for Trade and Control of Defense Material and Dual-Use Technologies, which identifies technologies at risk of being exported in dual use and its criticality, has the legal¹³ mandate to define only chemical, biological, and nuclear technologies -and not other technologies.

Second, the revised 2021 National Security Strategy also foresees three monitoring policy measures. These are a dynamic catalogue of resources on the country's strategic sectors;

⁹ De Alvear Trénor, I. (2020). Nueva regulación de las inversiones extranjeras directas en sectores estratégicos de España y la UE, incluido el de Defensa. ARI 89/2020. Elcano Royal Institute.

¹⁰ Spain has been one of the five Member States which have notified in total more than 90% of cases on the EU's FDI Screening Mechanism, what shows an upwards trend in the consideration of strategic sectors. Source: <https://trade.ec.europa.eu/doclib/html/159935.htm>

¹¹ Critical technologies and dual-use items as defined in Article 2(1) of Council Regulation 428/2009, including artificial intelligence, robotics, semiconductors, cybersecurity, aerospace, defense, energy storage, quantum and nuclear technologies, as well as nano- and bio-technologies.

¹² This falls back on the Spanish Organic Law 3/2018 on Personal Data Protection and guarantee of digital rights.

¹³ Royal Decree 679/2014 (Annex III.3) indicates the technologies at risk of being exported in dual use, but only includes CBN materials (chemical, biological, nuclear) and not technologies [Sec. Commerce, Ministry of Industry, Commerce and Tourism].

preparedness and resource readiness plans upon several risk scenarios; and an early warning system based on indicators.

The risk is still that of failing to distinguish between critical and other types of technologies. Doing so will be essential to have fully actionable, comprehensive monitoring mechanisms which allow a country going ahead of risks and threats on critical technologies.

CONCLUSION: PROMISING OPPORTUNITIES, BUT LIMITED MECHANISMS

At this stage, Spain plays a significant role in the EU regarding strategic dependencies touching on some technologies. Spain is the main EU sourcing country (100%) for strontium, a critical raw material essential for green technology¹⁴. It also has the 6% of EU's source on silicon metal (for semiconductors).

The EU reminds that determining¹⁵ the strategic nature of capacities and dependencies (industrial, technological, or material) can only be done on a case-by-case basis, taking into account not only quantitative data but also qualitative, ecosystem-specific elements and expert knowledge.

Overall, Spain has so far set up a number of monitoring mechanisms which are comprehensive. However, the challenge -and the risk- still lies in the lack of a clear, well-framed definition of what 'critical technology' means on its own, and also with respect to other technologies. This requires a thorough mapping of capabilities, and a sustained governance model across ministries, public agencies, and private stakeholders working on this realm. When it comes to critical technologies, it is necessary to define what should be prioritized over others. Priority leads to resources allocation, effectiveness, and impact assessment. Otherwise, risks, threats -and opportunities- will not be fully tackled.

¹⁴ See further information on: <https://www.csic.es/en/innovaci%C3%B3n-y-empresa/oferta-tecnol%C3%B3gica/energia/greener-technology-producing-permanent-strontium>

¹⁵ European Commission, *Strategic dependencies and capacities*. Commission Staff Working Document. SWD(2021) 352 final.

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