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**Decarbonisation and digital
transformation: to be or not to be
dependent on strategic minerals**

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Decarbonisation and digital transformation: to be or not to be dependent on strategic minerals

Abstract:

Since the 1970s — with the establishment of the Raw Materials Supply Group — one of Europe's goals has been to achieve a secure supply of raw materials for the industrial sector. The health crisis caused by the coronavirus has caused this concept to be reinforced within the EU, especially as it affects the supply of certain mineral materials that are key to three strategic sectors: Renewable energies, e-mobility and defense / aerospace.

For this purpose, the European Commission has presented an “Action Plan for critical raw materials”. With it, it is intended to advance towards greater strategic autonomy in certain essential minerals in the technologies necessary to carry out the ambitious green and digital transition

Keywords:

Strategic minerals, raw material, rare earths, EU, China, Green Transition, Digital Transition

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Los minerales estratégicos: el ser o no ser de la descarbonización y la transformación digital de la UE

Resumen:

Desde los años 70— con el establecimiento del Grupo de Suministros de Materias primas—uno de los objetivos de Europa ha sido alcanzar un suministro seguro de materias primas para el sector industrial. La crisis sanitaria originada por el coronavirus ha provocado que se refuerce este concepto dentro de la UE, especialmente en lo que afecta al suministro de ciertos materiales minerales que son claves para tres sectores estratégicos: Energías renovables, e-movilidad y el de defensa/aeroespacial.

Con este propósito, la Comisión Europea ha presentado un “Plan de Acción para materias primas críticas”. Con él, se pretende avanzar hacia una mayor autonomía estratégica en determinados minerales imprescindibles en las tecnologías necesarias para llevar a cabo la ansiada transición verde y digital

Palabras clave:

Minerales estratégicos, materias primas, tierras raras, UE, China, transición verde, transición digital

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Introduction

One of the many lessons learnt from the crisis caused by the COVID-19 pandemic is that it has highlighted the vulnerability of dependence on foreign markets in certain sectors that are considered strategic, as well as the negative effects that supply disruptions have had on essential value chains.

This does not mean that we are witnessing the end of globalisation, but quite the opposite. Precisely because the world is global, the EU must reinterpret its interests to maintain or improve its economic position in the world ranking, and also realign its geostrategic interests to counteract its excessive dependence on raw materials considered key to the green and digital transition.

Due to the projected growth of the world's population and the increasing demand for energy, water and food, competition for natural resources is expected to be at the centre of all geopolitical rivalries. All this is aggravated by climate change –the consequences of which we are already seeing today– which is forcing us to move towards decarbonised economic models. In addition, we must also consider another pressure factor in the use of natural resources: the digital transformation by the use of mineral materials distributed in a heterogeneous way on the earth's crust.

Sustainability seems to be the only effective way to meet these unprecedented challenges that humanity will face in the coming decades. This is the understanding of the European Union, which has already embarked on its transition towards a green and digital economy, with which it aims to achieve a position of global leadership as it has always done with the fight against climate change. Furthermore, this new economic model –boosted and accelerated by the pandemic– is the path that will guide the economic and social recovery from the health crisis throughout the Union.

To make this green and digital transition, the EU needs to decrease its dependence on certain technologically-necessary raw materials. A more resilient economy needs a more secure and sustainable supply of these materials. Otherwise, as stated by Maro³

Šefčovič, European Commission Vice-President for Institutional Relations: *“We cannot replace our current reliance on fossil fuels with one on critical raw materials”*¹

In order to advance towards this strategic autonomy in the technologies needed for this green and digital transition, the European Commission presented, in September 2020, the Communication entitled *“Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability”*². This document reaffirms the principles set out in the “Raw Materials Initiative” launched in 2008 with the aim of ensuring the safe and sustainable supply of minerals needed by industry and society. This initiative was based on three essential pillars: a fair and secure supply of raw materials through international markets, a sustainable supply within the EU and a more efficient use of raw materials through recycling processes. This is in line with the economic and competitiveness model established in the “Horizon 2020” research and innovation programme³.

Now that this date has been reached and with the presence of the health crisis caused by COVID-19, the European Union needs more than ever to address the security of supply of certain raw materials if it is to continue to commit to green and digital growth for its ambitious recovery plan from the pandemic. The European Green Pact⁴ will hardly be possible without access to certain materials needed for the manufacture of wind turbines, solar panels and batteries for electric cars. In addition to these materials related to clean technologies, there are others that are essential for the aerospace, defence, pharmaceutical and technology sectors, as stated in the EU Industry Strategy⁵.

Aware of this great challenge, the Commission has presented three key documents to focus efforts and ensure a safer and more sustainable supply of raw materials for the EU: The Action Plan on Critical Raw Materials, the CRMs List 2020 and the prospective study “Critical Raw Materials for Strategic Technologies and Sectors in the EU - A Foresight Study” on critical raw materials for certain strategic sectors at two horizons, 2030 and 2050.

¹ [Speech by VP Šefčovič at Critical Raw Materials presser \(europa.eu\)](#)

² <https://ec.europa.eu/docsroom/documents/42849>

³ <https://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020>

⁴ https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_es

⁵ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0102>

The Action Plan on Critical Raw Materials

As regards the Action Plan⁶, it sets out four objectives and ten lines of action to meet them with the ultimate aim of promoting the strategic autonomy of the European Union in an interdependent world. In this way, the EU is following the same path that other countries such as Japan and the United States have already taken to establish their own mineral supply chain. The high dependence on third countries makes economic growth and security very vulnerable. For example, the recent announcement by the US that excessive dependence on foreign materials, particularly from China, is a matter of national emergency⁷.

As set out in this Action Plan, the EU needs to diversify its supply of critical mineral materials and make better use of the resources available within its territory, applying the strictest environmental and social standards.

The re-use, repair and recycling of products will be another priority for the EU to counteract its vulnerability to external dependence on these critical mineral materials. The most extreme case of this dependence is the group of rare earths on which the EU is almost 98% dependent.

On the other hand, it will also be necessary to support research and innovation of alternatives to the use of these critical mineral materials as well as to make more efficient use of them.

And finally, since the EU will continue to depend on the exploitation of these mineral resources in third countries in increasingly complicated and unpredictable markets, it will be necessary to establish a strategic trade policy based on economic diplomacy.

⁶ <https://ec.europa.eu/docsroom/documents/42849>

⁷ <https://www.whitehouse.gov/presidential-actions/executive-order-addressing-threat-domestic-supply-chain-reliance-critical-minerals-foreign-adversaries/>

PRIORITY GOALS AND LINES OF ACTION OF THE EU CRITICAL MASS ACTION PLAN**GOAL 1: Resilient value chains for the Union's industrial ecosystems**

Action 1- Launch of an industry-driven European raw materials alliance in the third quarter of 2020. Its initial goal will be to generate resilience and open strategic autonomy for the rare earths and magnets value chain, and then extend its work to other subject areas.

Action 2 - Development of sustainable financing criteria for the mining, extractive and processing sectors in the delegated taxonomy acts by the end of 2021.

GOAL 2: Circular use of resources, product sustainability and innovation

Action 3 - Launch in 2021 research and innovation activities in the field of key raw materials, in relation to waste treatment, advanced materials and substitution, within the framework of the Horizon Europe programme, the European Regional Development Fund and national research and innovation (R&I) programmes.

Action 4 - Identify the potential supply of secondary raw materials from EU stocks and waste and identify viable recovery projects by 2022.

GOAL 3: Supply from the European Union

Action 5 - Identification of projects and investment needs in the field of mining and processing and related financing opportunities for key raw materials in the EU that can be operational by 2025, giving priority to mining basins.

Action 6 - Development of knowledge and skills in the fields of mining, quarrying and processing technologies as part of a balanced transition strategy in transition regions from 2022 onwards.

Action 7 - Deployment of Earth observation and remote sensing programmes for resource exploration, operations development and post-closure environmental management.

Action 8 - Development, from 2021, of R&I projects under the Horizon Europe programme on processes for the exploitation and treatment of key raw materials, with a view to reducing their environmental impact.

GOAL 4: Diversifying supplies from third countries

Action 9 - Development of strategic international partnerships and related financing to ensure a diversified and sustainable supply of key raw materials, including through the elimination of distortions in trade and investment conditions, starting with pilot partnerships with Canada, interested countries in Africa and the EU's neighbourhood in 2021.

Action 10 - Promotion of responsible mining practices for key raw materials through the EU regulatory framework (proposed in 2020-2021) and relevant international cooperation.

The growing list of critical raw materials for 2020

As mentioned above, the European Commission has also updated the Critical Raw Materials List (CRMs List 2020)⁸. This list has been published since 2011 and is updated every three years. Over the years the classification criteria and the number of materials included have changed. It is therefore a live list that reflects the growing demand for certain minerals as a result of the rise of new digital technologies and the achievement of climate objectives. In addition to demand, geopolitical factors that may affect supply in the near future are also taken into account, such as the emergence of new powers with growing domestic demand and greater geopolitical weight capable of altering access to certain critical raw materials, as is the case of China.

Thirty materials have been included in the 2020 list. For the first time, bauxite, lithium, titanium and strontium appear, and helium has been eliminated as its economic importance has diminished. Of these, lithium deserves special attention as it is estimated that the EU will need 18 times more lithium in 2030 and 60 times more in 2050.

The report “Critical Raw Materials for Strategic Technologies and Sectors in the EU - A Foresight Study”

The report⁹, also published in September 2020, casts little doubt on the vulnerable situation of the EU in its dependence on critical materials and the need to move towards technological sovereignty. In this “digital re-industrialisation” of the EU –which is considered key to overcoming the economic crisis resulting from COVID-19– the supply of certain critical minerals such as rare earths, gallium, germanium, and platinum group minerals must be guaranteed, and manufacturing and assembly opportunities for critical components for sectors that are considered strategic must be strengthened: Renewable energies, e-mobility and defence/aerospace.

Although there are many difficulties in accurately determining the supply of these minerals in the future –mainly due to the breakdown in the balance between supply and demand in markets that tend to be non-transparent¹⁰– the data provided by this report can be

⁸ <https://ec.europa.eu/docsroom/documents/42849>

⁹ <https://ec.europa.eu/docsroom/documents/42881>

¹⁰ <https://www.houstonchronicle.com/business/energy/article/Mineral-markets-lack-transparency-13683040.php>

considered worrying. The figures provided reflect a reality that can no longer be ignored: if the EU does not wish to break away from the group of technologically advanced powers, it must limit its dependence on the outside world for minerals for which demand is expected to soar in the short and medium term.

The report includes nine technologies that are key to achieving climate ambitions and digital transformation and are also strategic from a defence and aerospace point of view. They all depend on critical raw materials and related products, which generally have China as their main supplier.

In the case of lithium batteries, China provides 66% of the final product while the EU provides only 1%. As far as combustion cells based on platinum group minerals are concerned, it is the US and Canada together with Japan and South Korea that dominate production, with 48% and 51% respectively. The EU barely reaches 1%.

In wind energy where rare earths are needed, the EU provides only 1% of these raw materials, with China holding the monopoly. However, when it comes to assembly, the EU exceeds 50% of the world share. In photovoltaic technology, the EU does not show better figures either, providing only 1% of silicon-based assemblies.

Another key technology of the decarbonised future is electric traction motors, an essential part of e-vehicles. In this case it is rare earths and borates –part of permanent magnets– that are associated with supply risks as China dominates the market. As far as the production of such engines is concerned, the EU only achieves an 8% share of a market dominated by Japan with a 60% share.

Digital technologies are also conditioned by the supply of various elements such as copper, gallium, germanium, gold, indium, rare earths, tantalum and platinum group metals. In this case, China and the African countries are the main suppliers with shares of 41% and 30% respectively. The EU is also highly dependent on third countries, mainly in South East Asia, for the assembly of high-tech components.

In the field of robotics, the EU produces only 2% of the 44 materials involved. China is the largest supplier (52%), followed by South Africa (15%) and Russia (9%). However, the EU's role in component processing and assembly is more prominent, with shares of 21% and 41% of world supply.

For the technology used in UAVs (Unmanned Aerial Vehicles) and drones, the EU is also highly dependent on external suppliers for both raw materials and components. Once again, China provides a third of the raw materials, followed by South Africa with 7% and Russia with 6%. The advantage in this case is that the remaining 50% is in the hands of many small suppliers, which is a relief for diversification.

Also the materials needed for additive manufacturing and 3D printing show a high dependence on China, which reaches the 35% share, while the EU provides only 9%. However, for processed materials, the EU covers almost half of the world's supply.

Goal: Avoiding dependence on China

The urgency of addressing the climate crisis through the decarbonisation of economies and the race to lead the digital version of the world through 5G and artificial intelligence (AI) has placed strategic minerals at the centre of a competition that may influence new geostrategic alignments¹¹. For the EU, this issue is particularly worrying because of the excessive dependence already discussed above.

According to the World Bank, the demand for some minerals such as aluminium, cobalt, iron, lead, lithium, manganese and nickel –related to electric storage batteries– may exceed 1000% by 2050. Add to this the fact that the EU is 75% to 100% dependent on most of these metals, and it is clear that the EU industrial ecosystem may be highly vulnerable and not very resilient in the near future¹².

China not only markets 90% of the world's rare earth supply but also has a commercial strategy focused on exploiting mining resources in other regions such as Latin America, Africa, Australia and Greenland¹³. These participations are often made thanks to the state support that Chinese companies have, which allows them to compete in conditions that are impossible for other companies, as well as providing local populations and infrastructure such as motorways, rail networks or hospitals. And there are several examples: in the Republic of Congo, China obtained the rights to the lithium, cobalt and coltan mines. In Kenya, China has provided \$666 million for the construction of a technology centre to offer internet in Konza, near Nairobi, probably in exchange for getting

¹¹ <https://www.iai.it/sites/default/files/iaip1927.pdf>

¹² <https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:52020DC0474&from=EN>

¹³ <https://www.mining.com/us-steps-up-efforts-to-limit-chinas-control-of-critical-minerals/>

a licence for oil, gold, and rare earth projects. Cameroon, Angola, Tanzania and Zambia are also mining targets for the Asian giant. In the specific case of Tanzania, it is of particular interest because it has rare earths such as neodymium and praseodymium, which are key to precision guided munitions technology¹⁴.

This monopoly is particularly worrying in the case of defence as China is the global producer of 58 percent of key raw materials for military applications. The risk of supply disruption is high due to the imposition of export restrictions or increased taxes. It is not even ruled out that China could use rare earths as a geopolitical weapon, as it did with the restrictions on Japan over the disputes in the South China Sea in 2010. This situation led to rising prices and a race to secure supply with the opening of new mining projects outside China, many of which did not prove viable when prices fell again.

In 2010, China also tried to reduce exports of these minerals, citing reasons of domestic pollution, but the World Trade Organisation agreed with the US, Japan and the EU, which acted as plaintiffs in a situation that violated international trade rules.

As China consolidates its position as a world power, so does its influence in international organisations. In this respect, it is worth noting its increasing presence in standardisation institutions such as the ISO (International Organization for Standardization). Up to now, rule-making has been an area dominated mainly by the US, the EU and Japan. However, with the emergence of new technologies such as 5G, artificial intelligence, smart cities and the Internet of Things, China is increasingly playing a leading role in setting new standards that reflect its own interests. This situation can be seen as a further objective of China's geopolitical trade strategy in relation to new technologies, the use of critical materials and its interest in developing its "*Belt and Road Initiative*". In this way, it also exerts its influence through the mutual recognition of the regulations used by China and the countries through which the initiative passes¹⁵, which facilitates commercial transactions.

Nor does China cease to seek the justification for restricting its exports of strategic raw materials. Recently, a law was passed allowing the restriction of exports of sensitive material to protect national security, which has raised the suspicion that these materials

¹⁴ https://www.army.mil/article/227715/an_elemental_issue

¹⁵ <https://www.ifri.org/en/publications/notes-de-lifri/china-and-new-geopolitics-technical-standardization>

include rare earths and other minerals¹⁶. This announcement to restrict exports on security grounds is a response to a similar US position¹⁷. National security has therefore become a highly disruptive element in the strategic minerals market and it can be inferred that China and the US have a common vision: strategic minerals are a matter of national security¹⁸.

This type of legislation reaffirms the need to avoid continued dependence on China's monopolistic position in an increasingly opaque and unguaranteed market. The US and Japan have already taken steps to diversify their supplies, both looking at Australia's mineral resources and in the case of the US, establishing agreements with Canada¹⁹. New areas such as the Arctic or marine mining also open the doors to obtaining these critical minerals in other geographical areas.

For its part, as mentioned in the EU's Action Plan, one of the objectives is precisely to reduce dependence on China by seeking new suppliers, using what is known as "economic diplomacy". Recycling, the circular economy and the exploitation of own resources are other options that the EU must pursue in order to reduce its vulnerability to China's supply of these materials

We may be witnessing the beginning of the end of China's monopoly on rare earths. To give an example of this optimism, it is estimated that these five projects: the Nechalacho in Canada, the Zandkopsdrift in South Africa, the Bear Lodge in the US, the Kvanefjæl in South Greenland and the Dubbo Zirconia in Australia could meet one third of the world's demand for rare earths²⁰. But for production to take place, it is necessary to have a long-term vision and not be influenced by the ups and downs of mineral prices, especially when these fall and the interest in investing in their exploitation decreases due to the loss of profitability.

¹⁶ <https://www.china-briefing.com/news/chinas-new-export-control-law-restrictions-imposed-23-items-technology/>

¹⁷ <https://www.bloomberg.com/news/articles/2020-10-17/china-lawmakers-pass-export-control-law-protecting-vital-tech>

¹⁸ <https://www.mining.com/web/the-impact-of-critical-minerals-on-national-security/>

¹⁹ <https://www.canada.ca/en/natural-resources-canada/news/2020/01/canada-and-us-finalize-joint-action-plan-on-critical-minerals-collaboration.html>

²⁰ Riesgo García M. V and col. "Rare earth elements mining investment: It is not all about China" Resources Policy, Volume 53, 2017.Pag 66-76. ISSN 0301_4207

Exploitation of resources in the EU: yes, but not in a safe and sustainable way

As mentioned above, the EU seems to have already taken a firm decision to decrease its high dependence on China, as proposed in the Critical Raw Materials Action Plan. In addition to efficiency gains and the re-use of minerals, one of the measures envisaged in the Plan is to exploit the EU's own mining resources²¹. Despite the fact that this is a coherent measure –since there are deposits of some of these critical mineral materials in Europe that are included in the 2020 List– it does not have the full support of society, at least in Spain.

On 26 October, the Secretary of State for Energy of the Ministry for Energy Transition and the Demographic Challenge opened for public consultation a “Road Map for the Sustainable Management of Mineral Raw Materials”. The goal of this consultation *is to gather the views of interested persons and entities in order to identify the priorities and resources needed, as well as the main challenges for the sustainable development of mineral raw materials and possible measures to overcome them*²².

Since 2007, Spain has seen an increase in the number of prospecting licences and in the concession of new mining projects, thanks to the impetus being given to the sector by European institutions and regional governments, whose definitive support has been reflected in the publication of the EU Action Plan²³.

Among the opinions against mining, the one that stands out is that of the environmental groups that see in this new mining boom a speculative activity and a deterioration of the environment²⁴. They also consider the term “sustainable mining” to be a fallacy and doubt that mining contributes to a climate-neutral economy because it is a greenhouse gas generating activity²⁵. Another reason argued against mining is that the amount that could

²¹ <https://www.reuters.com/article/us-climate-change-eu-mining-idUSKBN2402JT>

²² <https://www.miteco.gob.es/es/prensa/ultimas-noticias/el-miteco-abre-el-proceso-de-consulta-previa-para-la-elaboraci%C3%B3n-de-la-hoja-de-ruta-para-la-gesti%C3%B3n-sostenible-de-las-materias-primas-minerales/tcm:30-515883>

²³ <https://www.ecologistasenaccion.org/wp-content/uploads/2019/12/Informe-Mineria-Especulativa-en-Espana.pdf>

²⁴ <https://www.ecologistasenaccion.org/131926/>

²⁵ <https://www.ecologistasenaccion.org/154726/denuncian-la-hoja-de-ruta-para-el-lavado-de-cara-a-la-mineria/>

be extracted would be minimal so the economic, social and environmental cost would not be worth it and would mortgage future generations²⁶.

Contrary to these arguments, other sectors involved influence the benefits that the extractive industry brings to the development of Spanish society with respect to other minerals extracted outside the territory. Minerals extracted in national territory comply with European and Spanish regulations in relation to some imported minerals that have been extracted from conflict zones or from areas where human rights, the environment or workers' health and safety are not respected²⁷.

Another argument in favour of the exploitation of own mineral resources is based on the introduction of technical process improvements to ensure the prevention, mitigation and control of negative environmental effects, as well as the promotion of the circular economy for waste management. In addition, the mining sector offers opportunities for the development of rural areas, although for this development to be full, it is not enough just to extract the resources, but it is also necessary that the subsequent processing and the entire associated value chain also remain localised at the regional and national level²⁸.

One step further: the search for alternatives

One of the objectives of the EU Action Plan for Critical Raw Materials sets out the need to support research and innovation into alternatives to both the use and procurement of these materials.

There is a lot of research currently being carried out that can help alleviate the high dependence on third countries for critical raw materials in the fields of technology and clean energy.

Capturing Helium-3 on the moon for energy resources and extracting minerals, such as rare earths from this satellite and on asteroids may be viable options in the medium to long term²⁹.

²⁶ <https://www.adanex.org>

²⁷ <https://cgeologos.es/noticia/el-icog-presenta-sus-consideraciones-a-la-hoja-de-ruta-para-la-gestion-sostenible-de-materias-primas-minerales>

²⁸ Ibid

²⁹ CASTRO TORRES, José Ignacio. La astropolítica en un mundo pospandémico. IEEE

Nuclear fusion is also a commitment to the future for the EU as a technological alternative in the field of clean energy. Nuclear fusion has the potential to provide a safe, affordable and sustainable solution to meet the EU's energy needs. Furthermore, it does not generate hazardous waste and can contribute to the achievement of climate objectives³⁰.

Research into the use of hydrogen as a fuel also offers encouraging results, especially if it comes from renewable energies. This green hydrogen is also a key part of transforming the EU's energy sector into a climate-neutral economy. In this context, the European Commission adopted in July 2020 a new strategy on hydrogen³¹ together with the EU Strategy for the Integration of the Energy System³².

Also the concern about high demand for lithium that is expected in the future is accelerating the search for alternatives in batteries, such as the use of more abundant sodium spread throughout the earth's crust³³.

CONCLUSIONS

The implementation of the EU's plan to achieve climate neutrality by 2050 and to carry out the digital transformation of its economic model depends on the availability of certain critical minerals such as rare earths, lithium, or cobalt whose production is mainly concentrated in China.

The COVID-19 health crisis has demonstrated how easily and quickly supply chains can be disrupted, and how it causes the collapse of strategic sectors in each nation.

The European Commission has presented an "Action Plan for Critical Raw Materials". The aim is to move towards greater strategic autonomy in certain minerals that are essential in the technologies needed to carry out the desired green and digital transition. In addition to making progress in diversifying supplies from third countries through

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http://www.ieeee.es/Galerias/fichero/docs_analisis/2020/DIEEEA17_2020JOSCAS_astropolitica.pdf

³⁰ https://ec.europa.eu/info/research-and-innovation/research-area/energy-research-and-innovation/nuclear-fusion_en

³¹ <https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:52020DC0301&from=EN>

³² <https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:52020DC0299&from=EN>

³³ <https://elperiodicodelaenergia.com/la-bateria-ideal-cambiar-el-litio-por-el-sodio-para-convertir-el-electrolito-en-solido/>

economic diplomacy, the EU intends to develop its own capacity for the extraction, processing, recycling, separation and purification of certain minerals, and in particular rare earths. The EU is also making efforts in research and innovation in the search for alternatives, both in obtaining these minerals and in energy alternatives, such as green hydrogen.

Achieving the goals of the Plan will not be an easy task given the geopolitical consequences of the change in dependence on exporting countries and the necessary involvement of industry, civil society and the States themselves.

There is currently an open debate between defenders and detractors of mining, especially in Spain, and this must be taken into account. But it should also be stressed that in view of the expected future demand for certain minerals and, even considering recycling and the use of secondary raw materials, the exploitation of new deposits is a real, accessible and affordable option.

China and the US regard the safe supply of these mineral raw materials as a matter of national security. Trade in these minerals can be negatively influenced if both powers use this argument in their trade battle with each other.

The importance of these minerals is critical for the EU. Without them, it could be relegated in the near future to the ranking of technologically advanced and economically decarbonised powers, as these materials are key to the clean energy, e-mobility and defence/aerospace sectors. For the EU and for other powers, whether they are part or not will depend on the ability to obtain a secure and sustainable supply of these critical mineral materials.

Just as climate change is currently regarded as a security risk, the disruption of the supply of critical and strategic raw materials should also be given the same consideration, owing to its impact on economies and because many critical minerals are an essential part of the new technologies applied to defence.

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